The effects of natural and anthropogenic noise on climber experiences in Grand Teton National Park

What will I get out of this?

This presentation will highlight the importance of measuring and protecting soundscapes within parks and examine sound impacts on visitor experiences, specifically while climbing the Grand.

**Abstract** 

National parks and wilderness areas are places where one could expect to find silence or escape from noisy urban environments. National park managers are taking steps to understand acceptable levels of noise and to mitigate noise so natural sounds are not compromised. The summit of the Grand Teton, located in Grand Teton National Park's Recommended Wilderness, is a popular climbing destination. This location is unique in that there is a combination of high climbing use and human caused noise within proposed wilderness, impacts that might counteract desired wilderness experiences. This research project explored the types of sounds climbers heard and the impact of those sounds during their climbing experience. This project provided managers with baseline information about the sound impacts in Garnet Canyon and the Grand Teton. Additionally, this project further justifies the importance of protecting natural sounds and advances the understanding of management challenges in Grand Teton National Park.

Keywords

Soundscapes, wilderness, management

Lead author / Session organizer

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Additional authors / organizers

Shan Burson- National Park Service Peter Newman & Derrick Taff - Penn State University

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No More Horsing Around: A Case Study of Equestrian use at Ozark National Scenic Riverways

What will I get out of this?

Visitor/manager conflict will continue to rise as competition for resources becomes more intense. This poster will explore ways to mitigate these conflicts.

**Abstract** 

Keywords

potential conflict index

Park managers must understand visitor attitudes toward various managerial actions to successfully conserve and protect the resource and the visitor experience. The purpose of this study was to investigate the relationship between horseback riders' level of support for various management actions based on attitudes towards social and resource conditions at Ozark National Scenic Riverways (OZAR). This poster will shed light on the relationship of equestrian recreation users' perceptions of management scenarios and the predicted conflicts between managers and said recreationists while utilizing the Potential for Conflict Index. It is hypothesized that as the level of conflict between users and potential management scenarios increases, the satisfaction at OZAR will decrease if said management scenario is enacted. The trails see use levels as high as 3,000 horseback riders during week-long trail rides (during high-use times in October), thus, the impacts may need to be mitigated regardless of user satisfaction.

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authors / organizers	
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additional	
speakers/panelists	
and titles of their	
presentations are	
given here	

The Cultural Resource Stewardship Assessment in the National Capital Region of the National Park Service

What will I get out of this?

Conference participants will learn about the piloting of a new initiative of the NPS that will help park managers to establish new resource management priorities.

**Abstract** 

Keywords

Stewardship, Resource, Management

In response to the National Park Service (NPS) Director's memorandum calling for the development of a new Director's Order D0-100, Resource Stewardship for the 21st Century, and in support of the NPS Call to Action and Cultural Resource Challenge, the NPS has launched a new Service-wide centennial initiative to assess the status of cultural resource baseline documentation, resource conditions, and overall program health. This effort, the Cultural Resources Stewardship Assessment (CRSA), is presently being piloted in two regions: the National Capitol Region (NCR) and the Mid-West Region. Within each region, individual parks form cultural resource teams to provide input from each program area. Regional staff also provide input to support the park's CRSA review, leading to a report that will inform park management and help to establish future resource management priorities. The principal author of this poster, Christopher G. Allen-Shinn, is the CRSA Project Coordinator for the National Capital Region.

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Session organizer	National Park Service - National Capital Region christopher_allen-shinn@nps.gov
Additional authors / organizers	
If this is a session of Invited Speakers or a Panel Discussion,	
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Connecting with Conservation: Urban Archaeology Corps in the National Park Service

What will I get out of this?

This poster will present a model for engaging urban youth to conduct archaeological research through a Nationwide partnership program model called the Urban Archaeology Corps.

**Abstract** 

This poster will evaluate goals, objectives, and outcomes of five Urban Archaeology Corps programs across the National Park Service. The poster will present the benefits and challenges of the model, summarize successes during the 2016 field season, and outline opportunities for program model development in the future.

Keywords

youth, archaeology, outreach

Lead author / Session organizer

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Kristen Allen, National Park Service

Erik Kreusch, National Park Service

Dania Jordan, American Conservation Experience

Giles Harnsberger, Groundwork Richmond

Heather McMann, Groundwork Lawrence

10645
Collaboration Session

Small changes, big difference. Ingredients for a happy, motivated protected area team.

What will I get out of this?

Protected area work will likely never be easy. The session will encourage creative thinking about practical and achievable ways keep personnel motivated, happy and effective.

**Abstract** 

Around the world, PA staff work in challenging, often hazardous conditions, with inadequate resources and support. The café will focus on achievable practical changes that can be made by individuals and organizations to motivate PA staff and to encourage them to stay in the job. This is part of a global initiative to harvest ideas about ways to support and encourage staff, even when you can't change the whole system or make money grow on trees. Cafe tables will focus on closely related, but slightly different topics and will include the following. 1. Creating a supportive and positive working environment. 2. Learning from and supporting each other at work. 3. Low cost solutions and workarounds. Solving big problems with small \$\$. 4. Managing your managers. Small tips for effective 'bottom up' change. 5. Personal growth. 'Intangible' capacities that help us survive and thrive at work. 6. Wild Card. Anything goes!

Keywords

Capacity, motivation, change

Lead author / Session organizer

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Additional authors / organizers

To be confirmed. Likely to be colleagues from Colorado State University

Communicating coastal vulnerability and climate change adaptation strategies to varied audiences

What will I get out of this?

Clear, informative communication through various media and methods is crucial for garnering public support of parks' adaptation to climate change and coastal vulnerability.

**Abstract** 

Parks and protected areas have opportunities to explain the role of climate change in increasing the vulnerability of coastal resources, and to describe how parks are preparing for and adapting to coastal changes in order to protect park resources and facilities. The topic of climate change can provoke heated discussions among park visitors and stakeholders. The conversation and public support for climate adaptation benefits from informative communication. In this session, parks and partners showcase various media and methods that they have developed to communicate with different types of public audiences about coastal vulnerability, the scientific and decision-making processes that inform park management, and park adaptation strategies and opportunities. Examples include interactive websites with teaching modules, interpretive wayside exhibits, newsletters, and synthesis reports.

Keywords

coastal, climate, adaptation

Lead author / Session organizer **Amanda Babson** Coastal Landscape Adaptation Coordinator

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Additional authors / organizers

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

Animating Outreach: Designing public texts that move audiences toward community resilience

Communicating Place-Based Climate Change Adaptation in the Great Lakes: The Apostle Islands National Lakeshore

Development of a Resource Stewardship Strategy Tool for the National Capitol Region

Integrating Coastal Climate Adaptation in National Parks: Part 2 of 2

What will I get out of this?

We provide updates on the latest projects and case studies of coastal climate adaptation for national parks integrating across natural resources, cultural resources and facilities.

**Abstract** 

Faced with rising sea level and other climate change impacts to coastal parks, the National Park Service is moving forward with strategies and taking action in parks so that, as the climate changes and affects parks, we can continue to serve visitors and provide stewardship and protection of natural and cultural resources. This session will span updates on guidance to coastal national parks to sharing examples of scenario planning, vulnerability assessment and adaption in progress in parks. It will have examples from natural resources, cultural resources, facilities and integration across them.

Keywords

coastal, climate adaptation

Lead author / Session organizer **Amanda Babson** Coastal Landscape Adaptation Coordinator

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Scenario Planning to Adaptive Management: A Case Study from Saint Croix Island International Historic Site

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

Perspectives of place: Stakeholder sentiments about adaptation strategies for historic buildings at CALO

Piloting an Integrated Vulnerability Assessment at Colonial National Historical Park Across Key Resources and

Bringing Historical Perspectives on Climate into Current Adaptation Practices

Developing adaptation planning through detailed, asset-level vulnerability assessment in coastal parks

### Science to Support Ecosystem Resilience post-Hurricane Sandy

What will I get out of this?

Share highlights of the extensive research on ecosystem resilience undertaken in parks post-Hurricane Sandy.

**Abstract** 

Following Hurricane Sandy, a broad range of research and monitoring focused on understanding coastal ecosystem resilience was undertaken in parks to help inform restoration and natural resource management, in preparing for future storms and sea level rise. This session shares results from those projects across a range of ecosystems and management questions, from a barrier island breach to urban ecosystems. The goal is to share both the science and park examples of applying the science to inform management decisions. This research directly benefits the management of each of the affected parks, and similarly can improve adaptation planning at other parks facing increased impacts of future storms due to sea level rise.

Keywords

Hurricane Sandy, resilience

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Additional authors / organizers

Hurricane Sandy's Silver-lining: Science-based Management for the Wilderness Breach at Fire Island NS

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

Toward Understanding Resilience: Measuring and Modeling Hurricane Sandy Impacts and Recovery at Fire Island

Post-Sandy Research Projects to Understand and Manage Social-Ecological Resilience in Jamaica Bay, NY

Lessons learned and generalities from looking across a range of coastal marshes

### Integrating Coastal Climate Adaptation in National Parks: Part 1 of 2

What will I get out of this?

We provide updates on the latest projects and case studies of coastal climate adaptation for national parks integrating across natural resources, cultural resources and facilities.

**Abstract** 

Faced with rising sea level and other climate change impacts to coastal parks, the National Park Service is moving forward with strategies and taking action in parks so that, as the climate changes and affects parks, we can continue to serve visitors and provide stewardship and protection of natural and cultural resources. This session will span updates on guidance to coastal national parks to sharing examples of scenario planning, vulnerability assessment and adaption in progress in parks. It will have examples from natural resources, cultural resources, facilities and integration across them.

Keywords

climate adaptation, coastal

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Sharing NPS guidance, strategies and examples through the Coastal Adaptation Strategies Handbook

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

Climate Change Adaptation Stra	ategies: Case Studies from	Coastal National Parks
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Lessons Learned: Evaluating the Effectiveness of Cultural Resource Management Actions

### Commemorating the 150th Anniversary of the 1868 Treaty of Fort Laramie

What will I get out of this?

Attendees will learn insights, challenges, and benefits of the collaborative planning process being employed by Fort Laramie NHS and its 25 traditionally associated tribes.

**Abstract** 

This session details the collaborative planning process occurring between the Great Plains tribes and the NPS to appropriately commemorate the nationally significant 1868 Treaty of Fort Laramie--the genesis of the reservation system, which has impacted tribal life across the country. American Indian nations--having survived colonization, assimilation, and cultural genocide--are seizing this opportunity to discuss the importance of recognizing, understanding, and celebrating indigenous cultures thriving in the 21st century. This process will result in appropriate commemoration events at and around Fort Laramie National Historic Site and, ultimately, interpretation of the complete story of the Great Plains Indian nations at this crossroads of the West. This collaborative planning process is occurring with the park's 25 traditionally associated tribes.

Keywords

collaborative, treaty, indigenous

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Maryann Neubert, Museum Curator/Cultural Resource Specialist, Fort Laramie National Historic Site (potential)

## Commemorating the 150th Anniversary of the 1868 Treaty of Fort Laramie

What will I get out of this?

Attendees will gain greater appreciation for the 1868 Treaty of Fort Laramie, and tribal nations/NPS engagement in collaborative planning to commemorate this nationally significant event.

**Abstract** 

This poster illustrates the historical perspective of Treaty Council proceedings at Fort Laramie in 1868, language of the treaty, 'signatures' of the principals, and the aftermath for indigenous lifeways. It also details the collaborative planning process occurring between the Great Plains tribes and the NPS to appropriately commemorate the nationally significant 1868 Treaty of Fort Laramie—the genesis of the reservation system, which has impacted tribal life across the country. American Indian nations—having survived colonization, assimilation, and cultural genocide—are seizing this opportunity to discuss the importance of recognizing, understanding, and celebrating indigenous cultures thriving in the 21st century. This process will result in appropriate commemoration events at and around Fort Laramie National Historic Site and, ultimately, interpretation of the complete story of the Great Plains Indian nations at this crossroads of the West.

Keywords

treaty, indigenous, commemoration

Lead author / Session organizer Tom Baker Superintendent

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## Public Perception of timber harvesting for biodiversity in a National Forest

What will I get out of this?

Participants will learn about the typology of a national forest user in the southeast, and three data collection techniques, a map, questionnaire, photos and interviews

**Abstract** 

This study examined the public perception of the harvesting over a three-year period with the aim of aiding biodiversity. The study site was the Nantahala National Forest, specifically the Fontana area.. Data was collected from two sources: The first were visitors in many different areas of the National Forest, and they were gives a series of three surveys (map and list of activities, questionnaire, and photos of harvests to respond to. The second data source was in-depth interviews with local forest harvesters in an effort to examine harvesting in small patches from their perspective. Results indicate a higher proportion of local users, and a perception of harvesting that is mutable with information about aim. On the other side the greatest barrier for small selective harvesting are the harvesters themselves, many unsure of the effectiveness of this small patch cutting on their business.

For	ests, pu	ıblic perce	eption
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## Building capacity for sustainable tourism in protected areas of the Brazilian Amazon

What will I get out of this?

Participants will learn how Brazil, the largest country in Latin America and a biological superpower, is expanding tourism opportunities in its protected area system.

**Abstract** 

razil, the largest, most populous nation in Latin America and a biological superpower, began creating its protected area (PA) system 70 years ago. However, with few exceptions, levels of visitor services and tourism in Brazilian PAs are still low. In the Amazon basin, half of Brazil's territory yet far from major cities to the south, poverty, threats to PAs and dependence on natural resources are high. In the Amazon, sustainable tourism can play a critical role in conserving biodiversity and improving rural livelihoods. This paper reviews the approach being used by Brazil's federal protected area agency, ICMBio, working with partners including the USDA Forest Service, USAID, and cooperating universities, to expand public use opportunities in Amazonian PAs. This includes developing demonstration sites such as Tapajos National Forest, Analvilhanas National Park, and Soure Extractive Reserve and conducting training programs to build a community of tourism practitioners.

Keywords

Brazil, ecotourism, Amazon

Lead author / Session organizer

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Additional authors / organizers

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10816 Compass Session

### **Natural Sounds Advisory Group organizational meeting**

What will I get out of this?

The IUCN Natural Sounds Advisory Group business meeting will build on momentum gained at the 2016 World Conservation Congress, co-create objectives, and identify new leadership.

**Abstract** 

The IUCN Natural Sounds Advisory Group (NSAG), whose mission is to understand and regulate noise as it affects protected areas, and nature and natural soundscapes more generally, was established in 2012 in part by the Natural Sounds and Night Skies Division of NPS, but was never fully populated or operationalized. Since then, rapidly accumulating evidence recommends managing anthropogenic noise to reduce impacts to wildlife, outdoor recreational experience, and human health. The business meeting will provide an update on the state of the soundscape protection within IUCN and build on the momentum gained at the 2016 IUCN World Conservation Congress to co-create draft objectives and action items intended to functionally and realistically elevate its international importance, as well as identify individuals who will take an active role in the next four years and beyond. We invite researchers, practitioners, and spatial planners interested in the noise regulation and soundscape planning to join.

Keywords

soundscapes, noise pollution

Lead author / Session organizer

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Additional authors / organizers

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10756
Collaboration Session

### Addressing biological resource stewardship needs through community stewardship

What will I get out of this?

Explore opportunities for community stewardship of biological resources, share stories of challenges and successes, and discuss appropriate metrics and strategies for addressing park needs.

**Abstract** 

The National Park Service Biological Resources Division is developing a new Community Stewardship Program (CSP) to promote and support biological programs and partnerships that engage youth, diversity, and underserved communities through citizen science. These programs will address park needs, build community relationships, and foster the next generation of park stewards. In order to build a strong foundation for this program, CSP is hosting an interactive Café Conversation to gather input from parks and partners to ensure the program can successfully support parks and engage new audiences. Attendees will (1) share stories of challenges, successes, and priorities from their experience with citizen science projects, (2) identify measurable outcomes and metrics for success, and (3) identify park needs for biological resource stewardship that could be addressed through citizen science.

Keywords

Engagement, Citizen Science

Lead author / Session organizer

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Additional authors / organizers

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Kelly Coy, Community Stewardship Program Project Manager, National Park Service - Biological Resources Division

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### Making a global connection to cultural landscapes

What will I get out of this?

Learn and share international trends in international cultural landscape practice an approach suited to incorporate dynamic processes as well as natural and cultural values.

**Abstract** 

The session will update participants on the innovative US/ ICOMOS Cultural Landscape Knowledge Exchange, a partnership with academy and the National Park Service (NPS) to connect heritage practioners. particularly in the United States, with the best ideas from across the globe in this dynamic field. Presentations will cover the mission of US/ICOMOS including opportunities for international internships and professional development. An overview of the elements of the Knowledge Exchange, the connections to the cultural landscape work in the NPS, as well as ways to share the best of international research, scholarship, and case studies. Topics will include the challenging issues such as the evaluation and management of change in both designed and vernacular landscapes. Participants will also be invited join the newly revitalized US National Committee on Cultural Landscape to both share ideas and to stay connected into the future.

Keywords

Cultural Landscape, International

Lead author / Session organizer

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Professor, Department of Landscape Architecture and Regional Planning, University of Massachusetts Amherst

William Pencek, Executive Director, US ICOMOS

Director, Center for Heritage and Society, and Professor, Department of Landscape Architecture and Regional Planning

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Associate Director, National Park Service WASO

**Executive Director, US ICOMOS** 

Associate Adjunct Professor University of Vermont

Indigenous Cultural Landscapes: From Concept to Research, Results, Rewards, and the Future

What will I get out of this?

Since the concept's 2010 introduction, research on the Indigenous Cultural Landscape has resulted in increased indigenous involvement, intriguing findings, and expanded perspectives. What comes next?

**Abstract** 

The Indigenous Cultural Landscape concept provides a Native perspective on landscapes that contain the natural and cultural relationships that could have supported an indigenous community prior to non-Native contact. First introduced at GWS 2011 from the National Park Service Chesapeake Bay office, this idea has led to research in identification, shared priority modelling, and mapping in the Chesapeake Bay tidal watershed, inspiring opportunities for collaboration, public interpretation, and resource management. This update session aspires to provide an overview of the research history, methodology and results, which include increased indigenous involvement and renewed connections to ancestral places; growing interest from other areas in adapting similar research methodology to their own regional geology and indigenous perspectives; and potentially new theories in pre-Colonial history and archaeological interpretation. Our goals with this panel are to explore new potential uses for this concept and discuss the challenges of its future use.

Keywords

indigenous, cultural, landscapes

Lead author / Session organizer **Deanna** Beacham American Indian Consultant

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Additional authors / organizers

Progress of the	Indigenous	Cultural 1	Landscar	e in the (	Chesar	eake Bay	v: 2010-	-2016

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Chesapeake Bay Priorities Research and the Rappahannock River Indigenous Cultural Landscape

Tribal Cultural Landscapes and Studies in the Western United States

10909 Panel Discussion (CMP)	Boundaryless Protected Areas: Are Land-Managing Agencies Equipped to Understand Them?
What will I get out of this?	This session will provide an introduction to boundaryless protected areas and discuss whether agencies are prepared to deal with them.
Abstract	This session will provide an introduction to boundaryless protected areas and discuss whether agencies are
Abstract	prepared to deal with them.
Keywords	boundaryless protected areas
Lead author / Session organizer	Deanna Beacham TBD
	d.beacham@vomcast.net
Additional	TBD perhaps Susan Dolan, NPS
authors / organizers	

10782 Compass Session

### Putting Culture First: Unpacking Toolkits for Large Landscape Preservation

What will I get out of this?

Participants evaluate large landscape approaches that bound culture, history and community, identify individual takeaways, and a collective charge for advancing cultural preservation at varied scales.

**Abstract** 

What does the "whole ecosystem" approach to landscape conservation look like from the vantage of cultural values? This panel explores large landscape preservation through the lens of human ecology and examines the tools, metrics and relationships that protect and revitalize communities. Case studies feature predictive modeling for identifying indigenous cultural landscapes, story-telling to define and activate landscapes of healing, collaborative stewardship of scenic values, aligning urban organizations around the preservation and use of public spaces, and tools for defining battlefields through community engagement in technology. After lightning presentations by our five panelists, a facilitated discussion among participants will probe strategies that place communities at the center of collaborative conservation projects. Participants will identify tools that can inform their individual work environments, and share thoughts on collective actions to support "scaling up" cultural preservation.

Keywords

landscapes, heritage, engagement

Lead author / Session organizer

### Christopher Beagan

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Additional authors / organizers

Christine Arato (will not be attending, but helped organize the session).

Jonathan Doherty, Assistant Superintendent, NPS Chesapeake Bay Office

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Uniting Communities across a Landscape of Divisive History in Freedom's Frontier National Heritage Area

Engaging Partners in the Use of Visual Resources Assessment Tools to Preserve a Dynamic Landscape

Using Military Terrain Analysis to Support Community Stewardship and Protection of Battlefield Landscapes

## **Modernizing Plant Records Management in National Parks**

What will I get out of this?

Audience members will learn about digital tools that can be used to manage plant records to the benefit of resource managers, scientists, and visitors.

**Abstract** 

In 2016, the Olmsted Center for Landscape Preservation, a program of the National Park Service, partnered with NCPTT and four national historic sites across the country to evaluate digital plant records management tools. These software applications, widely used by botanical gardens and arboreta, are largely new to U.S. land management organizations. Through aggregated information about cultivated and wild vegetation, plant records management databases enhance landscape preservation, inform conservation research, and provide innovative tools for interpretation that promote understanding and appreciation for parks' plant collections. Utility of these databases is scalable as well, from discrete sites to networks to large landscapes. This poster explains the findings of the software evaluation; presents lessons learned from allied professionals at academic institutions, arboreta, gardens, and land management agencies around the world; and answers common questions, including the relationship between plant records management databases and FMSS, ICMS, and natural/cultural resource inventories.

Keywords

landscape, plants, database

Lead author / Session organizer

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Additional authors / organizers

Ella Weber, Research Associate, National Park Service Olmsted Center for Landscape Preservation (SCA Conservation Associate)

# Communicating the Impact of Climate Change: A Partnership for the National Capital Region

What will I get out of this?

Audience members of this presentation will learn about creative ways to communicate about climate change impacts and apply it to their own work.

**Abstract** 

This presentation will provide an overview of the challenges that parks in the United States are facing due to climate change and discuss current NPS standards for communicating the complexities of climate change. This presentation will highlight an internship program that was developed between NPS' Urban Ecology Research Learning Alliance and George Mason University's Center for Climate Change Communication in 2012 in order to help the National Capital Region communicate with their visitors about impacts on natural, cultural, recreational, and historical resources. Undergraduates and graduate students from various disciplines (natural sciences, social sciences, graphic design, and film) develop communication materials discussing the impacts of climate change in their particular assigned park through numerous outlets, such as ranger briefs, guidebooks, social media, web pages, and videos. This presentation will highlight created materials from the past four years and discuss the process of development for interns and parks.

Ke		

Climate change; communication

Lead author / Session organizer **Lindsey Beall** Research Assistant

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### **Indigenous Cultural Landscapes in the Chesapeake Bay**

What will I get out of this?

The audience will view an example of how Indigenous Cultural Landscapes can be researched with stakeholders and academics.

**Abstract** 

The Indigenous Cultural Landscape (ICL) concept recounts how indigenous peoples of North America have regarded and used this abundant land for countless generations. ICL identification and the accompanying interpretive process began along the Captain John Smith Chesapeake National Historic Trail as a trail-related resource in 2010. Descendant communities are in partnership with conservation organizations and researchers to assure stakeholder respect in Chesapeake watershed tourism, interpretation, and resource protection. This poster will highlight a 2016 ICL study on the Rappahannock River in eastern Virginia. Using examples of GIS mapping, documentation from primary resource material, and American Indian collaboration with National Park Service entities, this presentation locates the possibility and urgency of deepening contemporary perceptions of land using community oriented approaches in the field of conservation.

Keywords

Indigenous research approaches

Lead author / Session organizer

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Deanna Beacham-author of Indigenous Cultural Landscape

## The Science and Politics of Restoring the Black Bear in Big South Fork NRRA

What will I get out of this?

Wildlife restoration involves the science and techniques for restoring wildlife but a successful effort includes working with the public, other agencies and politicians.

**Abstract** 

A bear research project that began in 1997 at the Big South Fork National River and Recreation Area has led to the successful establishment of a black bear population on the Cumberland Plateau of Tennessee and Kentucky. In 2014, the population estimate was 300. The opportunity for visitors to experience a bear sighting and the responsibility of the park to protect visitors and the bears has increased. Proactive bear education; increased coordination with state game departments around the park; installation of wildlife proof trash, recycling and food storage containers; food storage enforcement; and aversive conditioning of bears has resulted in no bear incidents in the park. Hunting seasons have been established around the park in both Kentucky and Tennessee and to date 81 bears have been legally harvested. Wildlife restoration is more complex than just the science of wildlife biology, it also includes challenging public and political issues.

Keywords

Bear, Restoration, Management

Lead author / Session organizer

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10667 Skills Session

# **Crafting Internships: Setting Your Interns up for Success**

What will I get out of this?

What makes for a great internship? Come learn about and discuss elements that set interns up for positive experiences.

**Abstract** 

A great many careers are rooted in successful internships. In a time where recruiting young, diverse, motivated students and recent graduates is critical to the future of conservation and preservation organizations, how do you develop internships that help interns grow and produce real work products? Come learn about the elements of being a successful intern host and discuss your experiences with interns and internships. This session will also introduce attendees to ways the NPS is using hiring authorities to retain talented interns.

Keywords

youth, internships

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### **NPS National Internship Programs**

What will I get out of this?

Audience members will learn about the NPS national internship programs, which provide paid work experience to hundreds of college and graduate students each year.

**Abstract** 

This poster will summarize the national internship programs organized by the NPS Washington office. The NPS Youth Programs Division collaborates with the Cultural Resources, Partnerships, and Science and the Natural Resources, Stewardship, and Science directorates to administer several internship programs aimed at introducing diverse undergraduate and graduate students to career fields in the NPS. Learn about how these internship programs work; how they're funded, the types of intern projects, program partnerships, and how parks and programs can become involved.

Keywords

internships, youth, partnerships

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Preserving Heritage Landscapes: Experiences and Challenges in 21st Century Stewardship

What will I get out of this?

Presenters will discuss a variety of approaches to the management of heritage landscapes in the 21st-century, developed through their internship/fellowship experiences.

**Abstract** 

Culturally and naturally significant landscapes serve as an intersection between people and the world around them. The stewardship of these cultural landscapes in the 21st century offers unique challenges for preservation and interpretation of heritage at various scales; from public parks and gardens to built urban environments. In this session, researchers discuss the management of heritage landscapes through archaeology, historic preservation, and plant records management—revealing treasure troves of valuable insights into the musical legacy of urban spaces, the ways in which groups negotiate racialized space, and the vast collections of scientific and historic data concerning plants on public lands. Despite the diversity of the landscapes in which they work and the tools they apply, they share the same goals—connecting the public to their heritage through the interpretation and preservation of landscapes as living and evolving records of a vibrantly textured past.

Keywords

Heritage, Landscapes

Lead author / Session organizer **Lorin Brace** PhD Student / Park Break Fellow

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Additional authors / organizers

Landscapes of Music, Memory, and Meaning: Archaeology of Detroit's African American Musical Heritage

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

Preserving Detroit's Musical Heritage: How Recording Studios Forged the Soundtrack of History

Keeping Public History Public: Interpretation, Community Engagement, and the Preservation of Detroit's Musical

Interpreting Racial Segregation at National Park Sites

Modernizing Plant Records Management

### Costa Rica Science Exchange

What will I get out of this?

Learn about a successful international conservation model, The Costa Rica Science Exchange, which promotes youth involvement and public engagement through citizen science and strong partnerships.

**Abstract** 

What do Continental Divides, migratory birds, and high school students have in common? The Costa Rica Science Exchange! In this program, youth from Monteverde, Costa Rica and Estes Park, Colorado spend ten days experiencing the ecosystems, wildlife, and culture of each other's homes. Students conduct citizen science projects in both locations that focus on conservation issues shared by the parks, such as: migratory bird counts, willow vegetation surveys, water quality monitoring, predator/prey transects, and setting up camera traps for wildlife. During these exchanges, students and instructors create an international network with colleagues involved in natural resource conservation and share ideas about how protected areas are managed. This program engages today's youth in better understanding scientific data collection and how it relates to global conservation efforts. It also exemplifies a successful international partnership between cities, nonprofits and parks.

Keywords

science-literacy, youth, partnerships

Lead author / Session organizer Michele Bratschun Resource Stewardship Program Assistant

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Additional authors / organizers

Scott Esser - NPS

Therese Johnson - NPS

## Public Service Announcements for Fish and Shellfish Consumption Advisory Education

What will I get out of this?

People will see Public Service Announcements (PSAs) created to remind fishermen to check for specific types of fish and shellfish consumption advisories.

**Abstract** 

Short Public Service Announcements (PSAs) have been developed by the NPS Ocean and Coastal Resources Branch, Office of Education and Outreach, Colorado State University and others to help spread the word about checking for fish and shellfish consumption advisories before fishing and harvesting fish and shellfish. Individual short-video cartoon PSAs that can be viewed on mobile phones and other screens have been created for shellfish, mountain lake mercury, tropical fish toxins, and freshwater fish. These PSA's will be on display along with information on how to find them for use in park areas.

Keywords

PSA, advisory, education

Lead author / Session organizer

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Additional authors / organizers

none

11422 Compass Session

## Pursuing parks and protected area careers in a changing political climate

What will I get out of this?

Our session offers lessons learned and career advice for students on how best to adapt to a shifting political climate for parks and protected areas.

**Abstract** 

Students will get to talk with senior level professionals in an informal session on how best to enter and advance parks and protected areas careers given recent shifts in the political climate. Students will also have the opportunity to hear how political administration changes in the past have shaped new conservation management approaches and shifted career opportunities with the National Park Service and other government agencies, non-profit organizations, and universities. Representatives from each of these fields will offer students honest advice about securing these different types of jobs and be successful in their career paths. The session will include a short introduction and open roundtable discussions that provide a constructive dialogue between mentors and mentees.

Lead author / Session organizer University of Illinois at Urbana-Champaign brownin@illinois.edu	Keywords							Keywords	Key
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Session organizer University of Illinois at Urbana-Champaign brownin@illinois.edu	Lead author /	Matthew Browning	Assistant Professor		wnir	:hew ]	Matthey	Lead author /	Lead a
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Jennifer Thomsen (U Montana), Jennifer Palmer (GWS)

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

10658 Compass Session

Visitor use management: Innovative approaches that inform management solutions

What will I get out of this?

Audience members will leave this organized session with understanding the innovative approaches being used to confront complex management challenges and inform contemporary management solutions.

**Abstract** 

Planning for, managing, and monitoring visitor use in national parks and other protected areas has long captured the attention of managers and researchers. To effectively manage visitor use in protected areas, information is needed about visitors, such as their temporal-spatial distributions of use, activities, perceptions, and their impact on park resources and experiences. The approaches to gather such information has become increasingly complex, including geo-spatial modeling, visitor simulation modeling, GPS visitor tracking (including cell phone technologies), geo-referenced interviews, web-cams, remote sensing, time-lapsed and motion-activated photography, and social media. Such approaches have provided park managers with novel information leading to innovative solutions to visitor use issues. The presenters in this organized session will highlight many of these approaches and explain how evolving methods translate into clear and measureable management actions.

Keywords

visitor use, monitoring

Lead author / Session organizer **Matthew Brownlee** Assistant Professor

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Additional authors / organizers

Ryan Sharp

Kansas State University

Mapping the relationships between trail conditions and experiential elements of long-distance hiking

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

Exploring new methods and technologies in trail use and impact monitoring for protected areas

Re-Evaluating Carrying Capacity and Visitor Use Management at Waterfall-Based Parks in Tennessee

Monitoring multiple visitor use indicators in diverse recreation settings in the White Mountains National Forest

Implications of webcam viewing for brown bear management at Katmai National Park and Preserve

# Preservation Planning and Partnerships in Gateway Communities and Managed Conservation Areas

What will I get out of this?

State, tribal, local, and federal preservationists will learn to anticipate potential impacts of park partnerships on gateway communities to make better informed resource management decisions.

**Abstract** 

Historic preservation has proven socioeconomic and environmental benefits, such as maintaining higher property values and creating a greater sense of community. This session will increase awareness of how the National Park Service provides technical and financial assistance for capacity building, informing state, tribal, local, and federal preservationists about available planning tools to anticipate and mitigate impacts of parks and partnerships on gateway communities. Selected case studies include two UNESCO World Heritage Sites, span nine states and one international border, and represent large and small urban and rural areas to demonstrate the relationships involved in managing conservation areas. Audience members will be better able to facilitate place-based conversations about informed resource management decisions with a new understanding of partnerships, acknowledging an unknown future due to climate change. This will result in a more just and equitable management of resources during standard operations and disaster response through increased information sharing.

Keywords

community, partnerships, planning

Lead author / Session organizer

**Kristine Brunsman** Program Assistant

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Additional authors / organizers

Seth Tinkham, Grants Management Specialist, State, Tribal, and Local Plans & Grants Division, National Park Service

The Public Lands Flora: Building informatics systems to manage biodiversity in protected areas

What will I get out of this?

Biodiversity informatics systems are increasingly critical to managing protected areas on a changing planet, this paper offers a vision for implementation of an NPS-wide system.

**Abstract** 

The Public Lands Flora (http://symbiota.org/nps) is a case-study for how to develop biodiversity informatics systems across disciplines to benefit land management in protected areas. The Public Lands Flora links checklist management and occurrence data with identification and analysis tools. The system draws on the NSF-funded open source content management system Symbiota and accesses millions of plant specimens housed in natural history collections. Symbiota is a platform for documenting biodiversity occurrences with a wide range of tools to share, visualize, and synthesize biodiversity data for research and management. Symbiota is a collaborative open-source software framework bringing together biodiversity informaticians and the collection research communities. With more than 30 portals, the Symbiota system access over a hundred million records across all taxa and offers a roadmap for a multi-phyla biodiversity information management system for protected areas globally.

Keywords	Biodiversity, informatics
Lead author / Session organizer	Steve Buckley Ecologist / Botanist  National Park Service steve_buckley@nps.gov
Additional authors / organizers	
If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here	

10654 Challenge Session Drowning in Controversy: How managing submerged lands promises to be messy, complex, and increasingly important

What will I get out of this?

Participants will leave informed as to the outcome of recent controversies, including Supreme Court decisions, governing access and use of inter tidal and submerged lands

**Abstract** 

The National Park Service (NPS) is one of several entities responsible for managing natural resources in coastal areas. However, the challenges faced by NPS managers are not unique. This forum outlines key topics associated with managing inter tidal and submerged lands. Antiquated legal statutes, changing water levels, and the fluid nature of park boundaries adjacent to water resources converge to make managing inter tidal and submerged resources, regardless of jurisdiction, particularly controversial. Speakers will frame the conversation using real world examples after which the moderator will host a conversation with attendees turned participants to discuss what works and what doesn't when managing public lands along the our nation's coasts, Great Lakes, and inland waters. Presenters are a combination of NPS managers with daily responsibility for managing submerged lands and inter tidal resources and professors from Norte Dame Law School who follow agency actions as they wind through our federal courts.

Keywords

Submerged lands, controversy

Lead author / Session organizer

#### Chris Buczko

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Additional authors / organizers

Bob Krumenaker, NPS, Superintendent of Apostle Islands

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presentations are given here

NEPA Coordinator, Acadia National Park

Superintendent, Apostle Islands

Policy and Regulatory Specialist, National Park Service

Associate Professor of Law

Professor of Law

## A Framework for Visitor Use Management on Federal Lands and Waters

What will I get out of this?

This session introduces the newly released IVUMC Visitor Use Management Framework, and will discuss framework application by the agencies involved in the council.

**Abstract** 

The Visitor Use Management (VUM) Framework, Edition One provides a flexible process for managing visitor use on federally managed lands and waters that can be incorporated into agency planning and decision-making processes. Visitor use management is fundamental for maximizing benefits to visitors while achieving and maintaining desired conditions on federal lands and waters. The VUM Framework can aid managers in collaboratively developing strategies for providing access, connecting visitors to key visitor experiences, protecting resources, and managing visitor use. The framework builds on lessons learned from previous approaches (e.g., Limits of Acceptable Change and the Visitor Experience and Resource Protection Framework) and will be shared by the six council agencies. The session will provide an overview of the recently released VUM Framework as well as discuss its utility for agency managers and researchers. This session will include case studies to illustrate how the framework is already being applied.

Keywords

visitor use management

Lead author / Session organizer Kerri Cahill Branch Chief and Visitor Use Management Team Lead

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introducing the Visitor Use Management Framework from the Interagency Visitor Use Management Council

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Applying the VUM Framework at Zion NP

Applying the VUM Framework to re-envision visitor use at Glacier Bay NP&P

Application of VUM on the Pike National Forest

Applying the VUM Framework to address camping on the Bridger-Teton National Forest

CAPSTONE CAMPAIGN: Exploring the Deep Reaches of Our Pacific Ocean Marine Protected Areas

What will I get out of this?

Connecting a broad community of scientists through advanced technologies enables large-scale characterization of the ecological, environmental and archaeological aspects of the Pacific Marine National Monuments.

**Abstract** 

CAPSTONE (Campaign to Address the Pacific monument Science, Technology, and Ocean NEeds) is a three-year NOAA-led effort to explore remote, deep ocean areas of the Pacific Marine National Monuments and National Marine Sanctuaries. Initial characterization of deep sea habitats, geological phenomena, and cultural heritage conducted by NOAA Ship Okeanos Explorer supports science and management needs for these monuments. Data is made publicly available within 60-90 days and include oceanographic and geophysical parameters, video, and images. Advanced communication and deep submergence technologies enable a collaborative science model allowing shore-based interdisciplinary science teams to join dives through video and data streamed live over the Internet. The video streams are an outreach tool that raises public awareness of these unique symbols of ocean conservation. This paper presents the successes of telepresence-enabled exploration and recent discovery of a WWII-era B-29 bomber near Tinian Island and an Imperial Japanese Navy auxiliary vessel off Wake Atoll.

Keywords

pacific, archaeology, exploration

Lead author / Session organizer

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Kelley Elliott, Expedition Manager, NOAA Office of Ocean Exploration and Research

Samantha Brooke, Manager, NOAA Marine National Monuments Program

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### **Preventative Conservation at NPS Museum Resource Center**

What will I get out of this?

Audiences will gain perspective of preventative conservation and how staff at the National Park Service Museum Resource Center applies methods to long term care.

Abstract

Proper preventative conservation for museum collections requires effective connections in order to sufficiently protect museum collections on an environmental level. All museum collection storage locations have particular environmental conditions which need to be controlled and monitored in order to maintain optimum preventive conservation standards. At the NPS Museum Resource Center (MRCE), one key objective of preventive conservation is to identify, monitor, document and mitigate agents of deterioration to provide a safe and stable environment for museum collections. Museum staff focuses on managing temperature, relative humidity, visible and ultraviolet light, dust, air pollution, and integrated pest management. Proper oversight and necessary action has proven to prevent potential disaster such as the recent mold outbreak at Harper's Ferry which required an emergency collections move to MRCE. This poster will demonstrate how MRCE's implementation of preventative conservation reinforces connections between MRCE staff at the collections storage facility over time.

Keywords

Conservation, Storage

Lead author / Session organizer **Ashley Carter** Museum Curator

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Additional authors / organizers

Joanne Westbrook - Museum Curator NPS, MRCE Lyndon Novotny - Materials Handler, NPS, MRCE

## Bats, White-nose Syndrome, and the Western Maryland Railroad Tunnels

What will I get out of this?

How a study of the rare bats living in the historic railroad tunnels of C&O Canal National Historic Park lead to unique habitat protection measures.

**Abstract** 

Three abandoned railroad tunnels in Chesapeake & Ohio Canal National Historical Park host the largest number of hibernating bats in the state of Maryland. They're also home to 2 federally protected and 1 state endangered bat as well as several other bat species. But conflicts with visitor use and resource protection, as well as the spread of the fatal white nose syndrome (WNS) had park staff. A study of bat populations concluded that the three tunnels provide regionally important hibernation sites for at least five bat species, and that individuals that hibernate in the tunnels and emerge in spring have no obvious signs of white nose syndrome. To protect these bats and the tunnels (included on the National Register of Historic Places as contributing to a historic district), the park commissioned specially designed gates to allow bat passage while preventing park visitors from entering the hibernacula.

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bats, white-nose, WMRR

Lead author / Session organizer Michelle Carter Acting Chief, Division of Resources Management

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"To the memory of their fellow citizens": Preserving multi-scale battlefield landscapes through government-stakeholder collaboration

What will I get out of this?

Attendees will learn how the ABPP provides technical assistance, federal grants, historical advice, and other related services to communities and stakeholders with battlefield preservation objectives.

**Abstract** 

With the first battlefield monument erected in 1799 (Revolutionary Monument, Lexington, Massachusetts) and the first attempts at battlefield preservation initiated in the 1820s (The Bunker Hill Monument Association, 1825), American battlefield memorialization and preservation is as old as the nation itself. However, in contrast to the largely triumphalist monuments of the nation's early decades, current study, commemorative, and preservation practices center on battlefields as common ground which facilitate community heritage engagement and social healing. This poster will introduce the ABPP's place within the NPS; present ABPP battlefield preservation techniques; and demonstrate how the ABPP provides grant support, technical assistance, and historical advice for a diverse range of government organizations and NGOs seeking to better understand, preserve, and interpret our nation's battlefields. Best practice case studies will exhibit recent collaborations including projects involving indigenous sites and peoples, battlefield boundary and content studies, Section 106 compliance, and land acquisition battlefield preservation initiatives.

Keywords	Words Preservation, Battlefields, Cultural					
Lead author /	Terence	Christian	Historian (Historic Preservation Specialis	t)		
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10656 Exhibit -- Tabletop The National Park Service's American Battlefield Protection Program and Success Stories at Indigenous Sites

What will I get out of this?

The public learns how a small federal program can provide technical assistance, grants, and other benefits for communities' battlefield preservation needs.

**Abstract** 

Keywords

Preservation, Cultural, Battlefields

The ABPP submits a proposal for an exhibit for the 2017 George Wright Society Conference. Surrounding an image of the National Park Service arrowhead will be photos of battlefields, archeology work, and public activities related to battlefield preservation. The purpose of the exhibit will be to provide an overview of the ABPP program, an explanation of how it fits within the NPS, and how it can help communities. Examples will be displayed focusing on work at indigenous sites (Wood Lake, Honey Springs) or related to indigenous people (Pequot, Pyramid Lake). It will also explain our battlefield preservation techniques, recent best practices and success stories, and opportunities for federal grant money. We will provide handouts and other information to be placed on the table.

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Session organizer	National	Park Service	American Battlefield Protection Program	m terence.christian@gmail.com
Additional authors / organizers				
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**Fasttrack Session** 

Utilizing NASA Earth Observations to Enhance Decision Making for the National Park Service

What will I get out of this?

Collaboration between NASA and park managers to foster use of Earth observations while providing unique capacity building opportunities for the future natural resource management workforce.

**Abstract** 

Ecosystem change poses significant risk and cost to the National Park Service (NPS) mission to preserve and educate. To address environmental challenges, the NPS has partnered with the National DEVELOP National Program to leverage NASA's suite of Earth Observing satellites, characterizing the extent, timing, and determinants of natural and human stressors on our national parks. Under NASA's Earth Science Division, DEVELOP's mission is to build the capacity of both participants and project partners to apply Earth observations in their decision making. This session will showcase several projects that DEVELOP participants have completed over the past year, with a focus on partners' increased awareness of NASA Earth Observing information products and participants' exposure to NPS decision makers.

Keywords

NASA, decision-making, collaboration

Lead author / Session organizer **Amanda Clayton** Project Coordination Fellow

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Additional authors / organizers

Ryan Avery, Project Coordination Fellow, NASA DEVELOP Program

If this is a session of **Invited Speakers** or a Panel Discussion, additional speakers/panelists

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presentations are given here Assessing Snow Cover Distribution and Persistence Changes in the Sky Islands of Saguaro National Park

Reconstructing Algal Productivity and Clarity of Alpine Lakes in Rocky Mountain National Park

Monitoring Invasives in Big Bend National Park, Valles Caldera National Preserve, and Bandelier National Monument

Monitoring Mangrove Health and Extent in Everglades National Park

# Creating Connections through Predictive Modeling and Cultural Resources Research

What will I get out of this?

This paper will connect prehistoric and modern populations using case studies of predictive modeling using NPS archeological site data from DEVA and Eastern coastal parks.

**Abstract** 

Internships with the NCPTT in Natchitoches, LA and NPS CR at WASO through the YLCC program have created connections through people, space, and time: research from Death Valley National Park (DEVA) and parks on the Eastern Seaboard have benefit greatly from these intersections. The NCPTT DEVA project developed a maximum entropy niche modeling approach to understand site formation processes as well as prehistoric and historical site selection, with the purpose of informing park personnel the location of potentially significant cultural resources. The YLCC internship at NPS WASO approached site modeling by using pre-existing database information to measure the effect of modern climate change on known cultural resources. Research from both projects have benefit from the collaboration of the other--during the projects themselves, through professional dissemination of results, and informing research methodologies and strategies in subsequent projects.

Keywords

GIS, Climate, Modeling

Lead author / Session organizer

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Additional authors / organizers

David Gadsby- Archeologist, WASO

Tad Britt- Chief of Archeology and Collections, NCPTT

**Environmental Literacy: Who will frame it?** 

What will I get out of this?

Provides definitions of Environmental Education/Environmental Literacy

**Abstract** 

A movement exists to bring the importance of environmental education (EE) to the forefront of leaders worldwide. Richard Louv, who, in 2005, published his book Last Child in the Woods, spearheaded this, pointing to the growing trend of lives focused indoors as Nature Deficit Disorder (NDD). With educational systems evolving in an increasingly virtual pathway (Hooferth and Sandborn, 2001), the responsibility for educating the public about the environment now falls on the shoulders of Parks and Recreation Professionals. In addition, research shows that environmental education instills a love for the natural world while encouraging stewardship and conservation (Louv, 2005). The purpose of this poster is to develop a better understanding among parks and recreation professionals of Environmental Literacy (EL) as it relates to the future of public lands; provide resources for EE program development; and promote a call to action for the North American Association for Environmental Education (NAAEE).

Keywords

**Environment, Parks, Lands** 

Lead author / Session organizer Virginia Coco PhD Student

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# Closing the STEM Gap With Diverse Youth: The Groundwork USA Approach

What will I get out of this?

Groundwork USA has been able to close the science gap for diverse youth through its corps programs using applied science to meet urban restoration challenges

**Abstract** 

Groundwork USA was created by the National Park Service and EPA. Our goal is to work on the environmental, economic, and health impact facing cities because of the presence of brownfields. Groundwork's approach is to initiate restoration work only thru community involvement, including youth. One obstacle is that many inner-city youth of color, nationwide, often drop out of science programs after entering in college as the course work is too challenging and/or lack of community support. Research shows this is often attributed to a lack of funding for expert instruction, poorly funded laboratories, and cultural priorities. Groundwork successfully changed this trajectory by using unique approaches to close the STEM gap that motivate youth to reconsider the impact they can have on their community and changed opinions of restoration work by utilizing a variety of applied science programs that impact a youth's network leading to new-found appreciation for this work.

Keywords

youth, diversity, STEM

Lead author / Session organizer

**Curt Collier** National Youth Programs Director

Groundwork USA curt@groundworkusa.org

Additional authors / organizers

An attempt will be made to bring a number of students to the poster session. The youth will have either worked on the Urban Archaeology Corps or served in a similar program.

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## Why STEM Enrichment Isn't Enough To Close the Diversity Gap in Science

What will I get out of this?

Participants will learn why to incorporate early place-based and hands on experiences with nature in order to close the diversity gap in science education.

**Abstract** 

Keywords

youth, diversity, education

Research has shown that many inner-city youth of color often drop out of science studies after entering college. This "diversity gap" is often explained as the result of a lack of funding in inner-city schools, which often don't have the adequate resources, equipment, or personnel to prepare students for rigorous studies after graduation. Additional school enrichment programs are often key to closing this gap, however, this may not be enough to help students hoping to study in the environmental sciences. Research suggests that early exposure to positive experiences in nature is also a big determining factor as to who goes on to study in fields related to the outdoors. This is often difficult in highly urbanized areas or in areas where the environment is degraded or polluted, places where diverse students often live. Groundwork's engagement of youth in stem-enriched restoration projects reveals this barrier can be ameliorated.

Lead author /	Curt Collier	National Y	outh Programs Dir
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Additional			
authors / organizers			

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10734 Challenge Session

Understanding the Visitor Experience and Transportation Confluence: Innovative Research and Strategies to support planning initiatives

What will I get out of this?

Presenters will challenge the traditional planning and research paradigms to meet emergent and evolving visitor use management needs in the context of the NPS mission.

**Abstract** 

The National Park Service mission, "...to preserve unimpaired the natural and cultural resources and values of the national park system for the enjoyment, education, and inspiration of this and future generations", is at the heart of all actions within the agency. As such, it is imperative that all NPS transportation plans, projects, and operations strive to support the enjoyment of visitors. Transportation has the potential to substantially influence visitors' experiences while visiting NPS units. Transportation within the National Park Service is about more than moving people and goods from an origin to a destination. Rather, transportation in the National Park Service facilitates visits to unique destinations by providing the public with both access to and mobility within the nation's natural gems and cultural treasures. Therefore, the goal of this presentation is to challenge participants to think creatively about how visitor experience contributes to transportation planning in the NPS.

Keywords

Transportation, Visitor Experience

Lead author / Session organizer **Rachel Collins** Visitor Use Management Specialist

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Additional authors / organizers

NPS Visitor Experience and Transportation initiatives

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

Applying best practices in transportation planning to the NPS context

Visitor use management as a framework to address transportation and resource management challenges, Arapaho-

Simulation modeling to estimate integrated transportation and visitor experience capacities, Cadillac Mountain, Acadia

A stated choice approach to Grand Teton National Park Visitors' Transportation Preferences

10774 Compass Session #getoutdoors: The implications and opportunities of social media for visitor use management in the NPS

What will I get out of this?

This session will address park managers power to leverage social media and provide examples of how social media can support visitor use management

**Abstract** 

In winter 2014, the sea caves at Apostle Islands National Lakeshore were accessible by foot travel for the first time since 2009- when Facebook had approximately 13 percent of its current users and Instagram was still more than a year away from being launched. This rare access made national news, and visitors flocked to the site and broke all of the parks visitation records....in January. This session will introduce some of the key trends in social media and how they are changing visitor use in our national parks. It will invite participants to share examples, experiences, and strategies to leverage social media to promote positive visitor use and to engage multiple audiences in public processes. #parkplanning #ivumc #findyourpark #KeepWildlifeWild #rangerspointingatthings

Keywords

visitor social media

Lead author / Session organizer

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10642
Collaboration Session

**Next-Gen Park Interpretation: Giving Visitors More Than They Expect** 

What will I get out of this?

Attendees will work on the scope and content of a theme issue of The George Wright Forum on history and interpretation in national parks.

**Abstract** 

The NPS keeps tabs on the park maintenance backlog to track the magnitude of budget shortfalls, but there is no companion assessment for interpretive maintenance. However, stories have a life cycle, and historic places take on new meaning over time. This workshop will gather potential authors for a thematic issue of The George Wright Forum that will address the chronic problem of outdated interpretation at national parks and the related issue of treating interpretation of natural and cultural resources separately. Themes under consideration include interpretation life cycles, the concept of generational significance, integrating natural and cultural interpretation, and interpreting sites of healing. This workshop will bring together authors who are committed to contributing (three to date) along with others who are interested in participating to discuss the issue's scope and content with the three guest editors.

Keywords

interpretation, history,

Lead author / Session organizer

**Rebecca Conard** Co-editor, George Wright Forum

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Additional authors / organizers

John Sprinkle, Bureau Historian (WASO), National Park Service (and GWF guest co-editor)

Thomas Medema, Chief of Interpretation (WASO), National Park Service (and GWF guest co-editor)

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Indigenous Consultation in the Era of Sustainable Development: The Ojibway Peoples of 10846 Canada What will I get out of this? In the awakening of sustainable development, infrastructure and livelihood creation becomes intertwined **Abstract** as an important pillar for nation states and communities. Often times, it is these projects that are casted as opportunities for inclusive growth, income generation, and community development. But do these projects follow through with the procedures and processes with indigenous communities? Why are the efforts of indigenous consultation, in particular sensitive and inclusive approaches such significant ladders to true sustainable development. This paper will take a look at the complex issue of indigenous consultation and development in Western Quebec, Canada. Through this paper, we hope to inform the indigenous sovereignty and consultation procedures of the Ojibway Nation. With a history of being the second largest First Nations Population in Canada, we will explore the resilience in the consultation procedures of the Ojibway Nation and resilience in inclusive development in defense of their natural resources and sustainable livelihoods. **Consultation, Development Policy** Keywords Gabriela Corbera Executive Director at Global Social Innovation Forum, Researcher Lead author /

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Stakeholder Collaboration for Transboundary Problem Solving in the Western Zion Canyon

What will I get out of this?

Attendees will learn about the benefits and challenges of establishing a collaborative stakeholder group focused on addressing regional issues around Zion National Park.

**Abstract** 

Many of the pressing management issues facing National Parks have important consequences for the surrounding region. In the region around Zion National Park, rapidly growing park visitation, commercial development, and traffic congestion have emerged as critical problems. Stakeholders in the Zion region recognize that since the scope and source of these problems extends far beyond the boundaries of the park, so too must solutions. With the help of facilitators from the University of Utah, officials from local cities and counties, state and federal agencies, and other local stakeholders convened to discuss the issues facing the region and coordinate their problem-solving. Through a series of meetings that began in July 2016, participants gained a better understanding of the problems, actors, and conflicts in the region and were able to better leverage their time and resources for enacting solutions, demonstrating a model for collaboration across multiple geographic scales and levels of government.

Keywords

collaboration, regional planning

Lead author / Session organizer

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Matt Brownlee, Assistant Professor, Department of Parks, Recreation and Tourism, University of Utah

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11022	The Yosemite Museum				
11032 Poster	The Foseinite Museum				
/hat will I get out of this?	Visitors to the museum will learn that Native Nations are not dead restricted only to museums.				
Abstract	From the time it opened to the public in 1926, the Yosemite Museum building has experienced many changes. While it started as a true museum housing specimens of flora, fauna and cultural artifacts it is no primarily office space with a small museum. Now, a visitor to the museum can interact with a cultural demonstrator to learn about traditional and contemporary life skills and carry on a conversation about traditional and contemporary native land management practices.				
Keywords	Museum, American Indian				
Lead author / Session organizer	<b>Ben Cunningham-</b> Park Ranger/Indian Cultural Demonstrator  Yosemite National Park ben_cunningham-summerfield@nps.gov				
Additional authors / organizers					

Does use level influence visitors' off-trail behavior in ways that are socially and ecologically important?

What will I get out of this?

This research shows that, in some places, visitor behavior may be more important than use levels when managing ecological impacts in off-trail areas.

**Abstract** 

Conventional thought in recreation management has been that visitors will spread out or disperse when sites are experiencing high use levels, especially in or into off-trail areas. These patterns of off-trail dispersion have the potential to cause both social and ecological impact. Therefore, understanding and managing visitors' off-trail behavior is often a concern for park and protected area managers. Using GPS-based tracking techniques combined with standard visitor use level counts from seven different protected area locations (Grand Teton, Rocky Mountain, and Yosemite National Parks and Arapaho-Roosevelt National Forest), this study shows that in some settings, visitors disperse less during periods of high use and more during periods of low use—directly opposite of the longstanding assumptions. These findings indicate that, at some recreation destinations, less ecological impact may occur during periods of high visitor use. These results have implications for visitor use management and recreation use modeling.

Keywords

Visitor behavior, GPS

Lead author / Session organizer **Ashley D'Antonio** Assistant Professor in Nature-Based Recreation Management

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Transmission of environment values: Who are the most influential sources and how effective are they?

What will I get out of this?

Data will be shared on the effectiveness of environmental values transmission from principal sources of influence and the most influential sources in the transmission process.

**Abstract** 

The transmission of values has been well studied, however the transmission of environmental values has received relatively little attention. Given that values are a predictor of attitudes and behavior, it is important to understand from whom they come and to what degree they are transmitted. This presentation examines the consonance and dissonance of environmental values between young adults and their self-identified principal source of influence. It also considers the salience of a variety of sources. Young adults, ages 19 to 21, at Clemson University were solicited to take an online questionnaire. A similar online questionnaire was sent to their principal sources of influence. A total of 93 young adult-principal source of influence pairs provided usable data. The results of the study will be shared to help conservation decision makers understand the effectiveness of environmental values transmission from principal sources of influence and the most influential sources in the transmission process.

Keywords	values, transmission
Lead author /	Gina Depper PhD Candidate
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10928 Collaboration Session	Meeting of GWS Student Chapters (Working title)
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Keywords	GWS student chapters
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Lead author /	Gina Depper Graduate Student Representative to GWS Board
Session organizer	
Session organizer	Clemson University gdepper@g.clemson.edu
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10850 Compass Session

Inventories 2.0: Shaping the Next Generation of Baseline Inventories of NPS Natural Resources

What will I get out of this?

The timing and audience at GWS provide an opportunity to engage a broad array of park stakeholders on future needs for NPS Natural Resource Inventories.

**Abstract** 

Since 1992, the National Park Service Inventory & Monitoring program has conducted an effort to complete 12 "basic" natural resource inventories, which were designed to provide park managers with information needed to effectively manage the natural resources. After 25 years, the NPS has nearly completed the planned inventories, providing a baseline that informs scientifically-sound management decisions and serves as a basis of long-term monitoring plans that help ensure the future health of the parks. The NPS I&M Program has begun identifying new natural resource inventories that will continue to inform current and emerging resource management decisions at the park level. This session will summarize interim findings from park-, I&M network-, regional-, and national-level scoping and provide an opportunity to provide additional input on inventory needs, opportunities to integrate inventory information into park operations, and potential uses of inventory data by partners and programs outside the park service.

Keywords	Inventory, Monitoring, Inventories					
Lead author /	Joe	DeVivo	Deputy Chief For Science, Inventory & Monitoring Division			
Session organizer	National Park Service joe_devivo@nps.gov					
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10706 Update Session

#### **Breakthroughs Bring Bison Restoration a Bit Closer**

What will I get out of this?

Important developments in the biological and social science of bison, are both exciting to the public and bring ecological restoration of the species closer.

**Abstract** 

Last year, an Act of Congress made bison the national mammal, and the International Union Conservation of Nature identified only two wild herds in the United States. Important scientific strides also were made in the ecological restoration of bison. 1) A population viability analysis conducted on the of 19 federal herds suggests how the fenced herds could be grouped to increase their effective size. 2) Genetic analysis demonstrates how herds can be monitored to determine when augmentation is necessary. 3) Techniques in embryo transfer showed how the herds with disease can still contribute to the bison gene pool. 4) Human dimensions studies showed how local communities can be directly involved in bison restoration. After the results of each bison study are presented, there will be a discussion of how they can be integrated to develop a full picture of wild bison restoration on several potential sites in the United States.

Keywords

bison, restoration,

Lead author / Session organizer **Peter Dratch** Supervisory Biology, National Wildlife Refuge System

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Additional authors / organizers

Looking forward: using population viability analyses to inform science-based bison metapopulation management strategies

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

American Icons in Metropolitan Grasslands: Bison Social Science Breakthroughs on Colorado's Front Range and Beyond

Transforming Interior Bison: From Livestock to Wildlife

10713

#### A Ten Step Program that Links Monitoring to Managment

What will I get out of this?

In a time of rapid environmental change, a monitoring strategy that links resource monitoring to management decisions is worth considering

**Abstract** 

Resource monitoring which is often expensive and time consuming, is usually targeted to meet the goals of each land management agency. In a time of rapid environmental change and constricting federal budgets, there is increased call for monitoring that directly informs difficult resource decisions faced by land managers. A recently published paper outlines a ten step process of getting to fundamental management issues and designing the appropriate monitoring methods to address them. This process preceding monitoring is outlined in a way that is useful to both scientists and managers.

Keywords

Monitoring, Management

Lead author / Session organizer

**Peter Dratch** Supervisory Biologist

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Additional authors / organizers

Melinda Knutson has worked for the U.S Fish & Wildlife Service and the U.S. Geological Survey. She is an author on guidleines for applying adaptive management and is currently Midwest regional inventory monitoring (I&M) coordinator in the National Wildlife Refuge Systems. Bill Thompson has worked to start the I&M programs of both the National Park Service in Alaska and the Fish and Wildlife Service in New England. Drs. Knutson and Thompson are authors of a recently published paper: "A road map for designing and implementing a biological monitoring."

## Wilderness Character Monitoring Continues on National Wildlife Refuges

What will I get out of this?

Because change in designated wilderness takes place over time, you need a strategy to get parks and refuges to continue the necessary monitoring.

**Abstract** 

A consistent and robust method of wilderness character monitoring called "Keeping It Wild 2" was developed collectively by the four federal agencies that manage wilderness. Wilderness Fellows have contacted the refuge managers and scientists to revise their measures of wilderness character and showed them how to put that information annually into the database specifically for the purpose. This regular outreach by young Wilderness Fellows who understand the application of the Wilderness Act and how to enter the data for measures developed at the refuge, has proved the best way to insure the monitoring continues.

Keywords

Monitoring, Wilderness

Lead author / Session organizer

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Additional authors / organizers

Marissa Edwards is a Wilderness Fellows working on wilderness wildlife refuges through a contract with American Conservation Experience

## **Effective Intergenerational Approaches for Parks**

What will I get out of this?

The audience (especially managers, organizations and Governments) will learn how to provide meaningful opportunities to young people, and how these opportunities will also benefit them.

**Abstract** 

With growing recognition that young people bring valuable ideas, enthusiasm, and first-hand experiences connecting youth to parks, there has been increasing opportunities for them to be involved with the projects and processes of various park-related organizations and institutions. This session will share some of the options and challenges of providing intergenerational opportunities to Young Professionals, including the benefits of doing so. Tips will also be provided on the approaches that young people find most meaningful and engaging within these opportunities. Success stories of various organizations (such as the Canadian Committee for the International Union for the Conservation of Nature (IUCN) and the Global Youth Biodiversity Network) will be highlighted, as examples of ways that effective intergeneration decision-making processes have occurred.

Keywords

Youth, intergeneration, decision-making

Lead author / Session organizer **Shailyn Drukis** Young Professional

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Changing Climate, Changing Policy: Subsistence Use and Wilderness Values in Gates of the Arctic

What will I get out of this?

At the increasingly important nexus of indigenous peoples, cultural and subsistence access to Parks and Wilderness, climate change, local knowledge, and impacts of local development.

**Abstract** 

Traditional ecological knowledge holders and scientists agree that changing temperature and precipitation patterns in Alaska are inducing cascading ecological effects on northern ecosystems. These changes are not only a concern for plants and animals, but also for the Native Alaskans who rely on these resources for cultural and economic stability. Few studies have been conducted to address this increasing threat to traditional lifeways. Access for subsistence and wilderness values are priorities for park management, but the challenges wrought by climate change necessitate reevaluation of park policy in regards to these topics and their intersection. The primary concern is whether snowmachine access is being impeded by poor winter travel conditions and/or a shorter winter season. Potential climate change impacts on subsistence use of Gates of the Arctic were investigated by spending time and conducting interviews in the community of Anaktuvuk Pass.

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Arctic, ClimateChange, Subsistence

Lead author / Session organizer Chris Dunn PHD Student; George Melendez Wright Young Leaders in Climate Change Intern

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## A landscape-scale analysis of parks as anchors of biodiversity

What will I get out of this?

We use a landscape-scale analysis that quantifies species and habitats information and apply it to a regional conservation and collaboration context.

**Abstract** 

The USGS worked more than 20 years developing comprehensive environmental data from Landsat used to show gaps in biodiversity protection. They now maintain databases of all protected areas in the US; habitat affinity models for every vertebrate; a national map of ecological systems that combines local physiography with existing vegetation; and predicted distributions of each species taking advantage of these 30 meter data sources. The implications are landscape-scale analyses can now be quantified with species and habitats information. We look at species diversity and richness by taxa across NPS units in an ecoregional context. Using our terrestrial vertebrate species models and protected areas database, we identify park units that, on average, have the potential for higher species richness and diversity then the surrounding ecoregion. We use some of these units as a case study to look at parks as potential 'anchors of biodiversity' in a region.

Keywords

biodiversity, protected areas

Lead author / Session organizer

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Kevin Gergely, National GAP Program Manager Leslie, Elaine, Chief, Biological Resource Division, Natural Resource and Stewardship

# **Current and Future Stewards: Strategies for Communicating Wilderness Values**

What will I get out of this?

Participants will gain an understanding of the wilderness values of wilderness professionals and communication strategies used with the general public.

**Abstract** 

The parks and wilderness profession continues to examine and represent multiple generations. These generations represent a diversity of values and numerous factors affecting individual perceptions. Do differences exist across these generations, or do parks and wilderness professionals share a common core of wilderness values? The purpose of this paper is to explore potential differences in wilderness values among wilderness professionals and to examine the appropriate strategies for communicating wilderness values with the general public. The paper will: 1) identify shared values among wilderness professionals across different generations 2) evaluate effective communication and education techniques for communication wilderness values, and 3) discuss barriers to connecting different generations to their wilderness heritage

Keywords

wilderness, values, communication,

Lead author / Session organizer

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## **Servicewide Water Resources Management**

What will I get out of this?

Recent efforts to advance fishing management, wetlands restoration, water resource monitoring, and floodplain management in the face of climate change will be addressed.

**Abstract** 

water

Keywords

The Natural Resources Stewardship and Science Directorate provides water resource disciplinary expertise to park units across the Service. The Water Resources Division continues to provide high quality service to park units across the National Park System and has developed new initiatives to support park management needs. Opportunities to support identification of servicewide needs and collection of private company funds for wetlands restoration are in development. Fish and fishing management policy and strategies are evolving to clarify expectations and cooperation with stewardship partners. Water resource monitoring is improving through training opportunities, standardizing monitoring practices, and improved water discipline/inventory and monitoring capacity. Floodplain management and development oversight is improving for parks servicewide to include new climate change standards. Water resource management provides many challenges and opportunities; and the National Park Service is working to ensure we protect our aquatic resources through thoughtful cooperation with our partners over time.

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## Pathways to Parks: Fostering the Next Generation of Stewards

What will I get out of this?

Attendees will see the model that has been successful in integrating diverse youth into the federal workforce using a high investment stepwise process.

**Abstract** 

The National Park Service (NPS) has set specific goals that chart a new direction of stewardship and engagement for youth, relevancy, and diversity. To meet these goals, Rocky Mountain National Park began a mutually benefiting partnership with Eagle Rock School to start the Pathways to Parks program. This program develops opportunities for a diverse community of students to connect with the NPS, get handson experience doing stewardship and science, increase scientific literacy, and provide a way for students to begin working for the NPS. Pathways to Parks utilizes a three-step approach to engage students: information, involvement, and internship. Steps include Eagle Rock coursework, professional development, field based citizen science projects, service learning, volunteering, and paid internships. This approach provides students with an introduction to the NPS, potential entry points to employment, and ultimately better prepares the next generation of park stewards.

Keywords

Internship, Pathway,

Lead author / Session organizer

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Additional authors / organizers

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Jon Anderson - Outdoor Education Specialist, Eagle Rock School and Professional Development Center

10878 Update Session

## **Engaging Youth in 21st Century Resource Stewardship**

What will I get out of this?

The Audience will benefit from a critical examination of signature NPS resource stewardship youth programs, their challenges and opportunities, and how to measure success.

**Abstract** 

Keywords

given here

youth, urban, diversity

The National Park Service has several established programs that provide rich opportunities for youth to directly engage in cultural resource stewardship. How well these initiatives function, and how successful they are in reaching youth on multiple levels are important ongoing queries to ensure such programs remain relevant and viable. The session panel, which includes student, partner, and NPS perspectives, will present an overview of such cornerstone NPS programs as Park Break, the Cultural Resources Diversity Initiative, Latino Heritage, Branching Out, and Urban Archeology Corps. Together the panelists will critically examine the impact of these programs by addressing such questions as: What are youth gaining? How is the NPS benefiting? How do the programs respond to issues facing urban teens? Do they align with career & technical trends in secondary and higher education? How well do they connect youth to conservation issues in their own communities? How do we measure success?

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Grand Canyon National Park and Neighboring Development: Stakeholder conflict and potential resolutions

What will I get out of this?

Two recent proposed tourist developments near Grand Canyon National Park have sharply divided key stakeholders. I examine these disputes while exploring broader park-wide implications.

**Abstract** 

Grand Canyon National Park (GCNP) is one of the jewels of the National Park System. Yet it suffers from some of the same problems that affect all parks, particularly development of neighboring lands that potentially threatens park resources. Currently, two contentious tourism developments have been proposed at the edge of the GCNP: the Tusayan expansion near the South Rim entrance and the Escalade project on the Navajo Nation. This presentation examines the social and environmental conflicts raised by both projects via an analysis of the interests and interactions of key stakeholders. Focusing on identifying mutually beneficial courses of action, I explore potential resolutions to these complex land use conflicts. Although the Grand Canyon is in some respects a unique case, such conflicts are common to parks facing neighboring tourist development. The presentation will therefore offer a broader framework of conflict resolution applicable to other units of the National Park System.

Keywords

**Grand Canyon, Development** 

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Bounding the Wild: The potential of coordinated management across agencies rather than a balkanized approach

What will I get out of this?

Investigating what strategies are most effective for coordinating management of Wilderness across federal agencies.

**Abstract** 

When the Wilderness Act was drafted in the 1950s and 1960s, the bill included establishing an overarching Wilderness Preservation Council to offer advice and provide information, however, the council was cut. In 2008 a committee formed to provide recommendations for monitoring wilderness character across the National Wilderness Preservation System (NWPS). However, system-wide implementation of these recommendations is still lacking and they do not address coordinated management for NWPS issues. This project examines whether a cross-agency council might be a more effective means of management across the NWPS; especially regarding non-native species, biodiversity, fire, climate change, recreation, and litigation facing the NWPS. If not, how can NWPS goals best be met within the current administrative system? Would a re-envisioned version of the Wilderness Preservation Council prove better at coordinating and steering NWPS management across all agencies in the face of these ecological, social, and political challenges?

Keywords

wilderness, management, coordination

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10772 Update Session Visitor-Use Management for Delaware Water Gap NRA's next 50 years: Next generation approaches and strategies

What will I get out of this?

This session is a case study at Delaware Water Gap NRA, updating the audience on next generation approaches and strategies for effective visitor-use management

**Abstract** 

This session is an in-depth case study of visitor use management (VUM) planning at Delaware Water Gap National Recreation Area (DEWA), with a focus on parallel social science research efforts. Session presenters will take the audience on a tour of the planning process, from problem and issue identification, through data design and collection, as well as integration of VUM best practices and finally how all those elements were used to inform the process. Each presenter will share unique insights, providing direct value to park practitioners and academics alike. The session will offer 1) an overview of the VUM framework and its application, 2) an overview of issues, opportunities, and strategies from DEWA staff, and 3) voices from various disciplines describing design and analysis to support visitor use management planning. These topics include indicators and thresholds, monitoring impacts to park resources, and an extension of science contributions for achieving problem-based solutions.

Keywords

Visitor-Use, Park Management

Lead author / Session organizer

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Applying Visitor Use Management Planning at Delaware Water Gap National Recreation Area

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Emerging visitor-use trends at Delaware Water Gap National Recreation Area

The new social scene: Social science for effective visitor-use planning at Delaware Water Gap NRA

Recreation Ecology and Visitor Use Management: A Delaware Water Gap National Recreation Area Case Study

An extension of social science contributions: Problem-based solutions for sustainable park management

Water-Based Outdoor Recreation Users' Attitudes Towards Potential Offshore Wind Energy Development in the Great Lakes

What will I get out of this?

With domestic renewable energy production ever increasing on public lands, audience members will gain further understanding into outdoor recreationists' perceptions towards wind energy development.

**Abstract** 

As the demand for renewable energy production in the United States continues to increase, wind energy remains one of the most viable domestic options. While numerous land-based wind installations are currently in operation, offshore wind installations have typically received stark opposition in the U.S. for various social, ecological, and political reasons. Due to recent capital investments, however, Lake Erie is now positioned to receive North America's first freshwater offshore wind energy project. Much of this proposed offshore wind energy infrastructure will either be within or adjacent to public lands, waters, and protected areas, raising concerns about the potential environmental and social impacts on recreation stakeholders in these areas. This case study examined water-based outdoor recreationists' (n=242) attitudes, impacts, coping responses, and support or opposition to potential offshore wind energy development within the Pennsylvania section of Lake Erie. Study findings and their implications for water-based natural resource management will be discussed.

Keywords

energy, water-based, recreation

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Andrew J. Mowen, Ph.D. - The Pennsylvania State University

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10865
Fasttrack Session

#### **Climate Change and Natural Disasters**

What will I get out of this?

Climate change is happening and increasing the frequency and severity of natural disasters. By being informed we can prepare.

**Abstract** 

How can we best prepare for climate change? The National Park Service is planning now for the future to best protect it's resources. What is predicted for National Park Service cultural resources and what type of planning is being done in response. We have also began to experience disasters with greater frequency and intensity. Is there a connection to climate change? How can we best prepare cultural resources for disasters? NCPTT developed Resilient Heritage booklet for the Louisiana Division of Historic Preservation with funding from the Louisiana Governor's Office of Homeland Security and Emergency Preparedness. The final presenter will discuss surveying and it's revolution over the last 10 years.

Keywords

climate change, disasters

Lead author / Session organizer **Andrew Ferrell** Deputy Director

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Preparing the National Parks for Climate Change

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

**Bigger and Badder Disasters** 

Resilient Heritage: Protecting Your Historic Home from Natural Disasters

Surveying to Prepare and Respond

10629 Challenge Session Preserving Ecological, Historical, and Cultural Integrity: The Next Century of NPS Resource Management

What will I get out of this?

This session will encourage audience members to think critically about how DO-100 will change NPS natural and cultural resource management in the future.

**Abstract** 

Keywords

Resources, management, policy

NPS faces increasingly widespread, complex, and accelerating environmental and social changes, including cultural shifts, climate change, and other dynamic pressures. Addressing these challenges while fulfilling our preeminent responsibility for resource stewardship requires managers to have access to the best available science and scholarship. Building off recommendations presented in Revisiting Leopold: Resource Stewardship in the National Parks, Director's Order 100 (DO-100) articulates policies and actions to support resource stewardship in the next century while providing a framework for NPS decision-making. Given the complex environmental and social forces affecting parks, and the irreversible consequences of these changes, what does the future of NPS resource stewardship hold? How can we work collaboratively to ensure science and scholarship is helping create transformational park experiences? This session will encourage NPS leaders to articulate their views, while challenging audience members to think critically about how DO-100 will change future NPS natural and cultural resource management.

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**Undergraduate Park Management Education: Missing the Mark On Indigeneity?** 

What will I get out of this?

This session will enhance participants' understanding of the protected area-Indigenous peoples relationship and how it is taught at the undergraduate level in the United States.

**Abstract** 

The relationship between protected areas and Indigenous peoples is a critical facet of contemporary park management. Sacred site management, traditional/subsistence use, artifact preservation, the incorporation of traditional (Indigenous) knowledge, culturally-appropriate interpretation, and opportunities for management partnerships are some of the ways in which Indigenous peoples and land management agencies may interact. But are American undergraduate programs in park management, heritage interpretation, and related fields preparing students for such work? To what extent do these programs teach students about co-management, relevant legislation, the impact of protected areas on Indigenous peoples, or the differences between Euro-American and Native American views on (and consequently, interactions with) nature? Using the National Association for Interpretation's database of undergraduate programs in interpretation, this session will explore these questions and discuss how universities can better prepare aspiring park rangers and managers to interact with Indigenous peoples.

Keywords

indigenous peoples, education

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additional	
speakers/panelists	
and titles of their	
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## Protected Areas: Laboratories of Settler-Indigenous Reconciliation

What will I get out of this?

I will highlight how parks can be conduits of settler-Indigenous reconciliation in North America and the importance of this work.

**Abstract** 

How can parks foster settler-Indigenous reconciliation in North America? John Borrows, noted Anishinaabe lawyer, has argued that we need to learn to learn from one another in North America. Interpreters have an obvious role to play in this, by ensuring Indigenous heritage and perspectives are respectfully, accurately portrayed throughout their offerings. Alan Cairns, a leading non-Indigenous voice on reconciliation, has suggested that settlers must accept Indigenous people as being 'citizens-plus', with rights beyond settler-North Americans'. Parks have a role here, too; consider that many Parks Canada units offer free entry to Indigenous peoples. This poster will attempt to respond to the challenge of reconciliation with these and other tangible examples grounded in legal and political theory. It will also highlight that we are all treaty people, for renewing the settler-Indigenous relationship requires us all to act, even if we are not in Ottawa or Washington, D.C.

Keywords

Indigenous, interpretation, management

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Dinosaurs of Alaska's National Parks and a regional perspective of their ecosystems and climate

What will I get out of this?

Given human proclivity for habitat manipulation, understanding ecology in deep time, through fossils and contextual data, is a powerful tool for managing resources on public-lands.

**Abstract** 

The National Park Service Alaska Region park units contain some of the most important fossil-bearing rocks anywhere in North America. Linking parks with similar-aged rocks, either within the National Park System or elsewhere, provides important insights on ancient and modern ecosystem processes. For example, the lower Cantwell Formation (LCF), Denali National Park directly correlates with the Prince Creek Formation (PCF), North Slope, providing an opportunity to examine regional variability across ~ 100 of paleolatitude. A rich dinosaur footprint record is known from the LCF while the PCF is famous for arctic dinosaur bones. The LCF had a paleolatitude of 65-750 N while the PCF had a paleolatitude of 75 -850 N. Together these formations document a Late Cretaceous cool temperate arctic with diverse flora, fauna, paleo-landscapes, and paleoclimate along a North-South transect. Emerging similar data from additional Alaska NPS units contribute to this region-scale understanding of ancient arctic greenhouse Earth.

Keywords

Dinosaurs, Paleoecosystems, paleo-Arctic

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Supporting collaborative science, stewardship, and capacity development - The CESU Network past, present, and future

What will I get out of this?

The audience will learn about the CESU Network -- its history, partners, activities, successes, and opportunities to support collaborative conservation into the future.

**Abstract** 

Now in its eighteenth year, the Cooperative Ecosystem Studies Units (CESU) Network is a national consortium of federal agencies; academic institutions; tribal, state, and local governments; conservation organizations; and other partners working together to support informed natural and cultural heritage resource stewardship. Authorized by Congress in 1998, the CESU Network brings together scientists, resource managers, educators, students, and other conservation professionals from across the biological, physical, social, cultural, and engineering disciplines (from Anthropology to Zoology) to conduct collaborative applied projects at multiple scales. The 17 CESUs represent biogeographic regions encompassing all 50 states and U.S. territories (and beyond), and collectively comprise more than 400 federal and nonfederal partners. This presentation will highlight features of the program through time including background and establishment, partners and projects, benefits and outcomes, and future directions.

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collaboration, partnerships, education

Lead author / Session organizer **Thomas Fish** National Coordinator

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Historical Ecological Considerations in the Establishment of National Parks and Monuments

What will I get out of this?

An historical analysis of national parks created over the last 100 years demonstrates that when managed unimpaired they overcome past land-use practices recovering ecologically overtime.

**Abstract** 

National parks are to be outstanding representations of natural and cultural resources that characterize our national heritage. Not only do candidate areas need to offer opportunities for public enjoyment or scientific study but must retain a high degree of resource integrity as a true, accurate, and relatively unspoiled example of a resource. So few natural areas in the Eastern United States today have these required attributes which limits the ability of the National Park System to accurately represent the range of natural resource values. Although the requirement to retain a high degree of resource integrity is a critical attribute, how important is it for the property to possess it now? In this paper, I will present several cases of national parks including the recently established Katahdin Woods and Waterways National Monument as example of national parks that had extensive land use challenges at the time of inclusion.

Keywords

**Historical Ecology** 

Lead author / Session organizer

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Tim Hudson, Superintendent, Kathadin Woods and Waters National Monument

Benefit of Ecotourism Development of two National Parks in West Africa on neighboring communities.

What will I get out of this?

This paper will give the communities residents' perspective of the value added by the ecotourism activities of the National Parks used in this study.

**Abstract** 

Study assessed perceived benefits of ecotourism in neighboring communities to two West African National Parks; Kanji Lake (KLNP) Nigeria and Mole (MNP) Ghana National parks. Stratified random sampling was used for household selection in 20 communities. Semi- structured questionnaires (582 respondents) and key informant interview were used to obtain data on the direct, indirect and service benefits. Using descriptive statistical tests, results suggest that at KLNP, provision of boreholes (45.7%) was the direct benefit rather than the provision of health services by 58.8% respondents of communities of Mole National Park. The indirect benefits at KLNP revealed that residents had the opportunity of providing transportation for tourists. Residents at MNP believed the indirect benefits they obtained was display of culture, arts and craft to tourists. Service benefits of permanent employment generated by the ecotourism development were similar at both National parks. A "needs assessment" survey of the neighboring communities is recommended.

Keywords

National parks, benefits

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RoseEmma Entsua-Mensah is the Deputy Director at the Council for Scientific and Industrial Research, Ghana. She has research interest in Ecotourism management.

# Connectivity from space: NASA programs in support of parks and protected areas

What will I get out of this?

The use of remote sensing for conservation is flourishing. Learn how NASA enables park and protected area management, especially related to landscape and seascape connectivity.

**Abstract** 

Satellite observations of Earth can provide a valuable perspective to inform park and protected area management. For over a decade, the NASA Ecological Forecasting program has enabled the use of space-based observations, in combination with in situ observation and models, to understand how and why ecosystems are changing, and predict how they could look in the future. This work is conducted in partnership with federal and state agencies, non-governmental organizations, universities, and the private sector. Here, we provide an overview of several recently funded projects that seek to enhance landscape or seascape connectivity to address conservation challenges, such as habitat loss, habitat fragmentation, and climate change. We also provide an overview of the Ecological Forecasting and other relevant NASA programs, highlighting projects in and around U.S. parks.

Keywords

connectivity, remote sensing

Lead author / Session organizer

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Allison Leidner, NASA Earth Science Division

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10640 Challenge Session

Keeping Our Secrets: Sharing and Protecting Sensitive Resource Information in the Era of Open Data

What will I get out of this?

Speakers with diverse perspectives will explore creative solutions for sharing/restricting confidential information on natural and cultural resources.

**Abstract** 

For decades, resource managers protected sensitive resource information by simply keeping it "under wraps." However, the current information climate favors sharing, the footprint of development activities and the information demands of associated compliance regimes are growing, and everyone's ability to find and share large quantities of information is on the dramatic increase. Challenges inherent in the "keep it all secret" strategy have become apparent. Resource stewards find themselves forced to weigh the risks of keeping secrets with those of sharing across disciplines; under-sharing may mean that resources are overlooked by planners and first responders while disclosing certain information, such as specific locations, can enable resource theft or damage. Panelists with expertise in the management of natural and cultural resources discuss how these tensions have affected resource management strategies. Participants in this session explore solutions for appropriate information sharing and resource protection, with special attention to climate change and incident response.

Keywords

data

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Archaeological Site Location and the Public Good: The DINAA Project

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Open-ish": Finding Balance between Site Data Protection and Accessibility at the State Level

Confidentiality: Who Decides?

To Share, or Not to Share? Perspectives from the field on Sharing Sensitive Information

A Tribal Historic Preservation Office Perspective on Sensitive Information

10560 Challenge Session

## Water – Where did it Come From? Where is it Going? What is it Doing?

What will I get out of this?

A landscape-level overview, with supporting details chosen from experience and research, will offer a renewed appreciation of environmental complexities including cutting-edge findings from climate-change research.

**Abstract** 

The source, the amount, and the method of arrival of water determine impact on the environment. Given the importance of water for all forms of life it is not surprising humans have long taken an interest in water quality, water sources, variation in supply. One of the earliest water studies conducted in the United States occurred in Boston, Massachusetts and was published in the very young American Academy of Arts and Sciences. Dr. Feron's 1783 "Experiments on the Waters of Boston" was dedicated to understanding purity of water by source and the implications for medicine and industry. Currently, much of the research on water in the environment attempts to improve understanding of water's role in ecosystems and the changes anticipated due to climate change. Speakers will walk audience members from headwaters to coastlines drawing from their research and experience to highlight the role of water in sustaining and altering habitat.

Keywords

water, environment, climate-change

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Headwaters, Water in a Mountainous Park

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given here

Flowing Streams, Descriptions and Trends

Water at the Margins, Changing or Sustaining

Coastal Waters, Surging and Rising

Sea Levels Rise, Change.

10551
Collaboration Session

# The Use of New Digital Technology to Convey Science Concepts through Animation

What will I get out of this?

Participants will contribute to a set of guidelines or a checklist of what-needs-to-be-done and what-needs-to-be-avoided to ensure comprehensible, science-education, animated videos are created for parks.

**Abstract** 

Animation offers a new mechanism to share science concepts with visitors. Drawing on established NPS data collections (e.g. I&M monitoring) workshop participants will be asked to consider: how best to present topics, potential target audiences, and techniques to avoid. Participants will be presented with a) examples of short, science-education animations and b) a list of potential topics to be animated. Using an organizer-prepared template, each table of participants will identify elements that succeed in conveying information, their limitations, and preferred topics for animation. Participants will collaborate to create a checklist or a set of guidelines outlining best practices from a non-science audiences' point of view for creating science, education animations. The final product from this workshop will be a set of guidelines or a checklist to promote creation of science-education animations of value. A paper will be submitted to the George Wright Forum.

Keywords

**Science Education Animation** 

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11075

Monitoring the effects of sea-level rise on groundwater quality, Jamestown Island, Colonial National Historical Park

What will I get out of this?

Audience members will develop an understanding of how sea-level rise affects groundwater quality, the threat this poses to archaeological resources, and value of long-term monitoring.

**Abstract** 

Jamestown Island, Colonial National Historical Park (COLO), Virginia, is well-recognized for its archaeological resources. Its low altitude and location on the lower James River near the Chesapeake Bay however, makes it vulnerable to sea-level rise and associated changes in groundwater levels and chemistry. Such changes, like increased salinity, can cause irreparable damage to still-buried archaeological artifacts. A long-term groundwater monitoring program is being implemented to understand how Jamestown's geohydrologic system will be affected by sea-level rise. Preliminary results from 45 monitoring wells indicate that shallow water (depth of 5-8 feet (ft)) has a higher specific conductance (7,000 up to 15,000 microsiemens per centimeter at 25 degrees Celsius (μs/cm), than deeper water (8-29 ft), which ranges between 2,000 and 6,000 μs/cm. This long-term monitoring program will provide knowledge of Jamestown's groundwater system for planning the protection and recovery of the archaeological resources as sea-level rise increasingly affects the groundwater system.

Keywords

water, archaeology, climate

Lead author / Session organizer

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## **Invasive Species in Guam's National Park and Their Control**

What will I get out of this?

Invasive species require quick responses for protection of park natural resources. Researching, prioritizing, innovating practical controls and partnering are shown to work at Guam.

**Abstract** 

Species found on Guam and their ecosystems have sustainably supported subsistence of indigenous Chamorros for over 3,000 years. But during the last generation invasive species have driven significant native species to extinction. Invasives populations on Guam threaten to invade other islands and spread devastation to their unique native species. Impacts of three select invasives (and innovative controls) are presented: brown tree snakes, Boiga irregularis, (aerial dispensing of acetaminophen in mouse baits); coconut rhinoceros beetles, Oryctes rhinoceros, ("gill" netting and removal of breeding material); and little fire ant, Wasmannia auropunctata, (specialized application of complementary pesticides).

Keywords

Invasives, Guam

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Kina Lewis - Pacific Historic Parks

10828 Update Session

## The State of Alaska's National Parks in a Rapidly Changing Arctic

What will I get out of this?

Invited Speaker/Panelist #6: Dave Payer. Climate change and subsistence harvest of wildlife in Alaska's Arctic parks and preserves.

Abstract

The Arctic is changing more rapidly than any other place on earth. Warming, increases in storm frequency and severity, permafrost thaw, and loss of sea ice all portend dramatic changes in Arctic ecosystems and biodiversity. These changes increase opportunities for resource development, commercial shipping, and tourism. The NPS manages nearly 20% of the U.S. landmass in the Arctic encapsulating over 21 million acres of tundra and boreal forest, and nearly 1,000 miles of coastline. Faced with unprecedented changes in park ecosystems, the NPS is actively engaged in efforts to document and forecast these changes, adapt its research and stewardship, respond to new opportunities for visitation, and increase resiliency through science and networking. This session will update attendees on the issues faced by the NPS in the Arctic through a series of presentations on park challenges, research and monitoring, and emerging opportunities.

Keywords

Arctic, climate, parks

Lead author / Session organizer

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10739

Avoidance of whales by large ships, with implications of varying ship speed and whale behavior.

What will I get out of this?

Operational and observational constraints affect whether large ships are involved in lethal collisions with whales. Insights have been generated in Glacier Bay

**Abstract** 

Lethal collisions between large ships and whales continue to be a national conservation issue, affecting whale populations along both the Atlantic and Pacific coasts. While the shipping industry is motivated to avoid collisions, ship operators often spuriously assume 'healthy whales will avoid ships'. Working with marine pilots in Alaska over the past 5 years, and using data collected during a 10-year effort by whale observers aboard large cruise ships in Glacier Bay National Park, we deconstruct how observational and operational processes collectively affect active whale avoidance. We highlight how a simple mitigation effort, reducing ship speed, plays an important role in whale avoidance by differentially affecting both processes. Finally, we identify outreach materials based on collaborative work with marine pilots that, coupled with development of modules in mariner training simulators, will help institutionalize the need for, and effectiveness of, whale avoidance measures.

Keywords

shipping, whales, mitigation

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## Livestock grazing and biodiversity in Huascaran National Park, Peru

What will I get out of this?

Participants will gain a better understanding of conservation challenges in protecting biodiversity and ensuring human livelihoods in a high altitude mountain ecosystem.

**Abstract** 

The Huascaran National Park, Peru is home to a high biological and cultural diversity nested within the largest concentration of tropical glaciers in the world. Although park management is aware of the overlap between livestock grazing and wildlife, no comprehensive surveys have been performed to assess the impact of livestock grazing on the diversity and distribution of mammalian communities in this region. The proposed research will use camera traps, hair snares, and sign transects to assess the diversity and distribution of mammals within Huascaran National Park; determine the extent of cattle grazing in strict protection areas; and identify the local variables that influence site occupation by different mammal species. The results from this study will be used to inform park managers of the status mammalian biodiversity as well as identify opportunities and challenges for conservation and sustainable grazing in Huascaran National Park.

Keywords

Mammals, biodiversity, grazing

Lead author / Session organizer

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# Reflections on the Past, Present, and Future of Civic Engagement in National Parks

What will I get out of this?

Audience will gain a better understanding of the historical context of recent NPS efforts to engage with the public on controversial issues.

**Abstract** 

In December 2001, as smoke was literally still rising from the site of the World Trade Center, the NPS Northeast Region held a conference in NYC to introduce the concept of "civic engagement" to the NPS system. Over the following decade the idea became institutionalized, with Director's Order #75A in 2003, then disseminated and implemented. While the term itself has lost popularity since 2009, its legacy within NPS remains in the form of workshops that train interpreters in "facilitated dialogue" with visitors; twitter accounts and other social media; increased efforts to reach out to towns neighboring NPS sites about land use management issues; and recent additions to the NPS system of historic sites that commemorate controversial events. The paper will briefly analyze the origins, promise, and pitfalls of the civc engagement initiative while encouraging audience discussion about its future.

Keywords

engagement, community, dialogue

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# The Future of Transportation Safety at the National Park Service

What will I get out of this?

This presentation will help to introduce ideas regarding the future of transportation safety for the NPS including current and future planned efforts.

**Abstract** 

In 2014, national parks received nearly 293 million recreational visitors, an increase of 10 million visitors over the 2012 visitation rate (Source: NPS Park Usage and Travel Modes). Automobile crashes associated with these visits continue to be one of the leading causes of fatalities in Parks. In concert with the NPS Mission statement, to preserve "unimpaired the natural and cultural resources and values of the National Park System for the enjoyment, education, and inspiration of this and future generations", it is imperative for the NPS to ensure that visitors are safely able to access and experience all the parks have to offer. The NPS is currently working on several initiatives to continue to improve transportation safety. This presentation will outline those initiatives within the context of developing a comprehensive transportation safety strategy and program while protecting natural and cultural resources.

Keywords

NPS, Transportation, Safety

Lead author / Session organizer

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Norah Ocel, Eastern Federal Lands Highway Division

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# Effects of landscape attributes on visitor spatial behaviors in protected area settings

What will I get out of this?

This study connects visitor behavior and management in a way that can promote resource protection and visitor management planning.

**Abstract** 

Protected natural areas provide desired settings for many outdoor recreation activities, but less is known about how the physical setting itself can shape recreationists' behavior. Visitor behavior is often more influential than amount of use in determining recreation use-impact relationships. This presents a need to identify key landscape attributes and quantify their influences on spatial and temporal aspects of visitor behavior. Influences of physical features were analyzed to characterize visitor behavior measured from GPS tracks of hikers in Rocky Mountain and Grand Teton National Parks. A preliminary analysis from Muir Woods National Monument suggested that hiking speeds decrease in proximity to tall tree groves. Characteristics of visitor behavior related to the landscape itself could help predict potential bottlenecks, guide trail and interpretation planning, and focus resource impact rehabilitation efforts.

Keywords	Visitor behavior		
Lead author /	Robin Graham Master's student		
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authors / organizers			
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Charting a Path: A Critical History and Analysis of Social Science in America's National Parks

What will I get out of this?

Audience members will learn a brief history of social science in U.S. national parks and recommendations for future research directions.

**Abstract** 

Using archival sources and my eight years' experience as the National Park Service's visiting chief social scientist, I examine the history and potential future of social science in America's national parks. Beginning in 1893 with Hiram Chittenden's Yellowstone visitor survey, social scientists have sought to understand connections between people and parks. Traditionally, the focus has been on connections between parks and their visitors; however, this emphasis needs to expand. Every day the regions around national parks become less and less like the desired conditions inside them. Unfortunately, competing interests make collaboration to address transboundary problems difficult. When this mosaic of interests fails to coordinate, it reduces the resilience of social-ecological systems including parks to respond to disturbances transcending park boundaries. As a topic melding social and natural sciences, studies of collaboration and the functioning of social-ecological systems should be near the top of the science agenda for America's national parks.

Keywords

None

sociology, history, policy

Lead author / Session organizer

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# The State of Unconfined Recreation in the National Wilderness Preservation System

What will I get out of this?

Learn how unconfined recreation is managed across the NWPS and critically explore whether all of the rules are necessary to preserve wilderness character.

**Abstract** 

Wilderness provides the opportunity for unconfined recreation, however, users' activities are frequently restricted as managers seek to balance the competing demands of the Wilderness Act. Over 350 different managerial restrictions for over 600 wilderness areas in the U.S. were placed into 19 broad categories of rules (i.e., camping, campfire, group size, stock). The most frequent rule – limits on group size – existed for 46% of the wilderness areas. Campfire, camping, and length of stay limits were present for 25% of the wilderness areas. This presentation will also focus on differences in the variables based on wilderness size, manager, and length of time it has been a designated wilderness.

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wilderness

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## Lessons Learned from the FWS Wilderness Character Reports for Unconfined Recreation

What will I get out of this?

Learn how other agency efforts can help you plan ahead to develop a baseline for unconfined recreation in wilderness character reports.

**Abstract** 

wilderness

All agencies have to develop wilderness character reports. Results from the Fish and Wildlife Service wilderness character reports can be used to help other agencies plan ahead about which variables they will use to establish a baseline of wilderness character for unconfined recreation. Although many agencies use the Technical Guide for Monitoring Selected Conditions Related to Wilderness Character to determine which variables to include as well as the weighting to apply to various regulations, there is considerable variation between FWS wilderness areas in terms of how the Technical Guide is applied. In addition, many of the wilderness character reports present an incomplete picture of unconfined recreation because the wilderness character reports are missing some key rules. This presentation will provide suggestions about how to establish a baseline for unconfined recreation in wilderness.

Reywords			
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10796
Fasttrack Session

Decolonizing Landscapes: Documenting culturally important areas collaboratively with tribes

What will I get out of this?

TCL can increase appreciation for past and present indigenous interests in the national landscape, and give original stewards a stronger voice in shaping its future.

**Abstract** 

The Characterizing Tribal Cultural Landscapes project outlines a proactive approach to working with indigenous communities to identify tribally significant places, in advance of proposed undertakings. A collaborative effort among BOEM, NOAA, tribal facilitators, and the THPOs of the Confederated Tribes of Grand Ronde in Oregon, Yurok Tribe in California, and Makah Tribe in Washington, we use a holistic cultural landscape approach to model methods and best practices for agencies and tribes to work together more effectively and appropriately. Case studies from each tribe demonstrate these transferable and transparent methods. The approach is adaptable by other tribes to record information on important places, and can help agencies and stakeholders engage with tribes prior to the proposal of activities that may impact tribal resources and areas. We will outline the project framework, selected case studies, and progress in changing the federal landscape.

Keywords

**Cultural landscapes, consultation** 

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Characterizing Tribal Cultural Landscapes: Framework

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Confederated Tribes of Grand Ronde Case Study: Understanding Place Through Indigenous Voice and Practice

Confederated Tribes of Grand Ronde Case Study: Indigenous Voice in Policy and Spatial Planning

Changing the Federal Landscape

## **Cultural Resources Toolkit for Marine Protected Area Managers**

What will I get out of this?

Online toolkit can help MPA managers and staff to better accomplish mandates and goals, and embrace new heritage-based opportunities for achieving and maintaining successful MPAs.

Abstract

In marine protected area (MPA) planning and management, cultural resources are often undervalued, misinterpreted, or overlooked. However, cultural resources and the cultural heritage they embody offer dynamic opportunities for improving outcomes in nearly every MPA. Whether preserving fish stocks, saving habitat, or protecting archaeological sites, MPAs themselves are a new facet in the cultural heritage of a nation committed to maintaining and improving its human connections with the marine environment. This toolkit is designed to help change MPA manager perceptions of cultural heritage and resources. These tools will help managers and staff to better understand and meet their legal obligations and embrace new heritage-based opportunities for achieving and maintaining successful MPAs. Topics include Cultural Landscape Approach; Integrating Cultural Resources into MPA Management; Engagement, Outreach & Interpretation; Tribal and Indigenous Communities; Research, Monitoring & Evaluation; Intellectual Property & Sensitive Information; Climate Change Adaptation; Disaster Preparedness; Underwater Archaeology. http://marineprotectedareas.noaa.gov/toolkit/

Keywords	Keywords Cultural, MPA, heritage		ıge
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Does the Timing of Educational Messaging Influence Compliance with Low-impact Hiking Recommendations?

What will I get out of this?

Audience will learn strategies to develop effective off-site visitor education programs as complement to on-site programs to educate visitors about low-impact recreation before they arrive.

**Abstract** 

We tested the potential of online pre-trip educational messaging in promoting low-impact hiking recommendations (i.e., hiking on muddy trail sections and walking on trail steps) using a lab-based experiment. The educational message used in the experiment consisted of video and short summary statements about low-impact hiking recommendations. Forty-seven participants were randomly assigned to one of three groups: 1) viewing an educational message at least 24 hours before the experiment; 2) immediately before the experiment; or 3) not viewing the message at all (control). Participants' hiking intentions were assessed by asking them to draw their intended hiking routes on a large LCD display depicting short sections of the Appalachian Trail. We found the educational message significantly improved participants' compliance intentions, knowledge levels, and attitudes. The timing of the educational message, however, did not show influences. These findings suggest low-impact hiking behaviors can be positively influenced through environmental education prior to trips.

Keywords

visitor education

Lead author / Session organizer

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Using Social Network Analysis to Inform Management: A Review of Research and an Illustrative Example

What will I get out of this?

Audience will learn about how to apply a relational approach to resource management challenges.

**Abstract** 

Parks, protected areas, and cultural sites management is at a point of transition, facing challenges from unpredictable natural environments and social environments charged with conflicting interests and polarized views towards resource management. These challenges call for research methods capable of capturing the interconnectedness between and within stakeholder groups and resource management agencies. The purpose of this poster is to show how managers and researchers have used, and can, use Social Network Analysis to examine resource management issues and build collaborative capacity for problem solving. Two case studies focused on community resilience to climate change and the role of stakeholder network structure in sustainable energy transitions will demonstrate the utility of social network analysis. Additionally, we will present Katahdin National Water and Monument as an illustrative example to show how social network analysis can be used to decode resource management controversies and explore strategies to build partnerships among communities and agencies.

Keywords

social network analysis

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# Battlefield Perspectives: The Charge of the 7th Maine Regiment at Antietam using Archeology and GIS

What will I get out of this?

Viewers will learn about how combining an analysis of the historic record, archeological assemblage, and GIS can assist the historian in interpreting the battlefield landscape.

**Abstract** 

Union and Confederate forces fought at Antietam Creek near Sharpsburg, Maryland, on September 17, 1862. It was the bloodiest single-day battle in American history with nearly 23,000 dead, wounded, and missing. Late in the day, an attack was ordered on a superior Confederate force — now known as the Charge of the 7th Maine Regiment. Historical accounts differ on the charge's route across the landscape and retreat through the Piper Orchard. This study uses archeological research and GIS analysis to inform the historical record and gain a better understanding of the charge. It demonstrates a framework for a deeper understanding of the events of the day at Piper Farm and potential applications to other battlefield landscapes.

Key	/W	10	ďS

Battlefields, GIS, Archeology

Lead author / Session organizer Tom Gwaltney Cultural Resource Specialist

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#### McDowell Sonoran Preserve Cultural Resources Master Plan

What will I get out of this?

The goals of preservation, education, and recreation within the Preserve are integrated with landuse of stakeholders, the public, Native American communities, and professional archaeologists.

**Abstract** 

Logan Simpson prepared a cultural resources master plan for the City of Scottsdale's McDowell Sonoran Preserve, a 33,000 acre expanse encompassing mountains and alluvial fans north of the Salt River in the Phoenix Basin of south-central Arizona. The master plan summarizes the city ordinances that established the Preserve, identifies stakeholders, lists public participation during development of the plan, and provides a compendium of known archaeological and historical resources in the Preserve. The master plan provides recommendations for the preservation and interpretation of cultural resources in the Preserve using sustainable methods that contribute to education, passive recreation, and enjoyment of the open space.

Keywords

Archaeology, master plan

Lead author / Session organizer

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Greta Rayle, North Wind

Helena Ruter, North Wind

Paula Scott, Logan Simpson

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10618 Exhibit	NPS Scaling Up
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hat will I get out of this?	Audience members will learn about the National Park Service Scaling Up Initiative by viewing this exhibit.
Abstract	Audience members will learn about the National Park Service Scaling Up Initiative by viewing this exhibit. They will have the opportunity to speak with Scaling Up community members and learn more about the NPS landscape initiatives and principles pertaining to landscape scale work. Multiple publications will be available for viewing and some as a take home, including: The 2016 George Wright Forum, Conservation in North America (IUCN World Conservation Report), and Scaling Up: Collaboration Across Boundaries.
Keywords	Scaling Up, NPS
Lead author /	Kassandra Hardy Large Landscape Initiatives
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National Colonial Farm in Piscataway Park: Green History, Farming, and the Quest for Relevance

What will I get out of this?

Learn how contemporary environmental issues can be examined through lens of history and how race connects to agriculture and connection to the land.

**Abstract** 

In 2014, the Accokeek Foundation began implementing a new strategic plan for its work in Piscataway Park, a national park and indigenous cultural landscape on the Potomac River directly across from George Washington's Mount Vernon. The plan prioritized uniting all of the Foundation's work under the interpretive message of sustainability and creating programs that are thought-provoking, participatory, and inclusive of different perspectives. New programs and projects include Green History (examining contemporary environmental issues through the lens of history), the Agriculture Conservation Corps (paid summer internship program for high school students), and an effort to "de-colonize" the colonial farm (examining how race is represented on the colonial farm). This case study explores how these efforts are transforming not only how the visitor experiences the park, but also how staff and board understand their roles as stewards of this landscape.

Keywords

N/A

agriculture, race, relevance

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10684
Collaboration Session

**Expanded Collaboration Between Cultural Resources and Interpretation/Education: Challenges and Opportunities** 

What will I get out of this?

Participants of the workshop will work together to identify and discuss the challenges and opportunities of collaboration between Cultural Resources and Interpretation/Education.

**Abstract** 

Too often in the NPS, Cultural Resource staff do not understand the experiences, needs, and pressures of Interpretation/Education staff, and the latter do not realize the wealth of useful information generated by the former. Being "siloed" in two different divisions does not help. This workshop seeks collaborative-minded folks from both Cultural Resources and Interpretation/Education to discuss the challenges and opportunities of expanded collaboration. What type of cultural resource information, and in what format, is most useful for front-line interpreters and educators? What and who defines history and interpretation in the NPS? Are cultural resources projects and documents created with the public in mind? This will be a forward-looking workshop based on the assumption that we all want visitors to NPS sites (and websites, exhibits, publications, etc.) to have the best experience and receive the best information possible. Increased collaboration is the way forward. How do we do that?

Keywords

cultural-resources, interpretation, history

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Paul Ollig, Chief, Interpretation and Education, National Mall and Memorial Parks, Washington, DC

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10676
Fasttrack Session

## Go Tell it on the Mountain: Civil Rights History and the NPS in Washington, DC

What will I get out of this?

This session will explore why the history of civil rights is important and provide examples of how to research that history.

**Abstract** 

The National Park Service is committed to telling a broader story of American history, one that is more inclusive of the experiences of underrepresented groups. Historians from the National Capital Region of the National Park Service will present four case studies of civil rights history in Washington, DC, and discuss how the NPS is researching and interpreting these stories. In brief powerful presentations, the topics will include the creation of schools for African American children in the Reconstruction Era, outdoor recreation and segregation of NPS golf courses, the relation of the NPS Summer in the Parks program and the Washington, DC riots of 1968, and the recognition of a historic site related to a pioneer in LGBTQ history. The presentations will be concise overviews, with pointers on how to research these types of topics, and sources and links for more information on the projects.

Keywords

civil-rights, African-American, LGBTQ

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"Education...means emancipation": Freedpeople's Schools after the Civil War

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Breaking Jim Crow: Segregation and National Park Service Golf Courses in Washington, DC

Riots and Recreation: The 1968 DC Riots and the NPS Summer in the Parks Programs

Outing LGBTQ History: The Kameny House in Washington, DC

## A Systematic Review of the Associated Benefits of Wildland Recreation

What will I get out of this?

Participants will learn about the benefits associated with outdoor/wildland recreation, their presence within the literature, general trends, and implications for managers and future research.

**Abstract** 

Many advocate that participation in wildland recreational activities can lead to individual benefits including environmental stewardship, personal development, sense of place, etc. However, what is the empirical evidence to support these claims? We conducted a systematic review of peer-reviewed research studies published between 2000 and 2016 that empirically evaluated the outcomes of participation in wildland recreational activities. The three primary objectives of this study are to provide a complete and exhaustive summary of peer-reviewed scientific literature to 1) identify the breadth of benefits associated with outdoor/wildland recreation; 2) examine whether in fact, these benefits are documented through scientific inquiry, and 3) identify gaps in the peer reviewed literature regarding the benefits associated with wildland recreation participation. General trends and implications of the results for managers and future research will be discussed.

Keywords

**Wildland Recreation, Benefits** 

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## **Honoring Tribal Legacies: An Epic Journey of Healing**

What will I get out of this?

Audience members will learn techniques for curriculum design that balance mainstream history with a place-based Native American perspective for K-12 classrooms in all academic disciplines.

**Abstract** 

In this presentation, participants will be introduced to the Honoring Tribal Legacies: An Epic Journey of Healing project and learn about the collaborative efforts of the National Park Service with Tribal people along the Lewis and Clark National Historic trail to produce educational resources. This curriculum design project balances the portrayal of different perspectives in history and asks us to acquire critical inquiry/analysis skills in order to answer questions such as, "Why are Tribal Voices important? How do we promote systemic change and broaden stakeholder ownership of a more inclusive and diverse approach to history?" Highlighting one of the Honoring Tribal Legacies demonstration curriculum - Discovering Our Relationship with Water, this presentation will stimulate participants to think about the current narratives offered in classrooms, and engage participants in a conversation about how to ensure that multiple perspectives and diverse forms of literacy are valued in K-12 classrooms across the country.

Keywords

Culture, Indigenous, Curriculum

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10680 Compass Session

Leveraging GPS tracking for improved decision-making: Innovative analyses and expanded visitor and resource management applications

What will I get out of this?

The session will explore new applications for integrating GPS data into visitor use management, encouraging thought and discussion on continued advancements in GPS-based tracking.

**Abstract** 

Increasingly, global positioning system (GPS) technology is used to collect objective spatial and temporal data to characterize visitor use patterns in parks and protected areas. Advances in technology and software have increased the accessibility of collecting and analyzing these data. As such, the possibilities for utilizing GPS data to inform complex visitor use questions have expanded rapidly in recent years. This session will highlight novel expansions in applying GPS-based tracking data to understanding spatial patterns of visitor use in a range of protected areas across agencies. Five, twenty-minute presentations will feature advances such as leveraging crowd-harvested data, repurposing previously collected data for new applications, and monitoring overnight use. Outcomes of new analyses will be framed to demonstrate the increased utility of GPS-based tracking data to inform management decisions. To conclude, audience members will be encouraged to discuss and propose additional GPS tracking applications through participation in a 20-minute Q&A session.

Keywords

GPS-tracking, management, spatial

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Improving predictability in visitor use and natural resource management using agent-based models of hiker movement

A spatial classification of vehicular behavior patterns of visitors in Grand Teton National Park

Spatial analysis of visitor use to inform interagency fee revenue sharing at Sequoia-Kings National Park

Monitoring use without direct observation: Classifying pack stock behaviors and distributions with GPS tracking

Utilizing crowd-harvested GPS data to manage special events and general use of public lands

# Protected Areas Database of the U.S. (PAD-US) - Land Management and Protection Status

What will I get out of this?

Learn how to download or explore maps, reports and data from America's official inventory of public parks and protected areas.

**Abstract** 

Keywords

Protected Areas

America's tremendous asset base of protected areas is critical for conservation planning, natural resource management, outdoor recreation, public health and more. These include national parks and forests, wildlife sanctuaries, state beaches and parks, county open space, city parks, land trust preserves, conservation easements, marine protected areas and more. Altogether, over 3 billion acres are managed by thousands of public agencies and non-profit organizations that serve current and future generations. A complete and current database of these places is a critical tool to achieve organizational missions across jurisdictions. The recent USGS PAD-US update (1.4) includes the best available representation of federal, state and other protected areas with descriptors like owner / manager name, designation type, unit name and other information useful for various applications. Join us to learn about America's official inventory of public parks and protected areas, our strategy to complete the inventory in three years and opportunities to help.

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Keywords

**Protected Areas** 

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Lead author /	Lisa Johnson Protected Areas Database of the United States (PAD-US) Coordinator
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11572 Update Session America's Parks and Protected Areas: The Protected Areas Database of the United States System

What will I get out of this?

Learn about PAD-US 1.4, a major update published by USGS, including the best available representation of federal, state, local gov, nonprofit and marine protected areas.

**Abstract** 

America's tremendous asset base of public land and other protected open areas is critical for conservation, recreation, public health and more. These include national parks, forests, wildlife refuges, monuments and wilderness; state parks and wildlife management areas; county open space and city parks; land trust preserves, conservation easements and marine protected areas. A complete and current Geographic Information System (GIS) database of these assets is a critical tool to achieve organizational missions across jurisdictions. The recently updated Protected Areas Database of the United States (PAD-US), published by USGS, includes the most complete data available on public parks and other protected areas. While there is still work to do, you can now see every available park and open space area owned by public agencies or nonprofits in many parts for the country. Come learn how we are building and using PAD-US, next steps to complete the inventory, and share your needs.

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### **Constructing Urban Youth Outreach Strategies in Urban-Proximate Parks**

What will I get out of this?

Attendees will learn about 1) creating an urban youth outreach strategy and 2) how such work attends to the NPS goal to attain relevancy.

**Abstract** 

Increasingly, urban-proximate park units turn to urban engagement as a way to achieve relevancy. Timpanogos Cave National Monument (TICA), located at the doorstep of the greater Salt Lake City metropolitan area, represents the NPS mission to two million Utah residents in the Wasatch Front population core. Using a SWOT Analysis framework, we developed an outreach strategy to help TICA interface with an urban youth population in Salt Lake City. This session outlines the process used at TICA for constructing an urban youth outreach strategy, a process that can serve as a model for creating outreach strategies in other urban-proximate parks. This session also explores how effective urban engagement planning achieves the agency-wide goal of making the NPS relevant to all Americans. Further work will analyze urban engagement best practices currently used by parks and investigate how best practices may be measured and applied to other parks.

Keywords

urban, outreach, relevancy

Lead author / Session organizer

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The Wasatch Front Urban Ranger Program: Partnership, Stewardship, and Volunteerism

What will I get out of this?

Attendees will learn about a university partnership program that fosters youth participation in urban recreation area stewardship and education.

**Abstract** 

The Wasatch Front Urban Ranger Program is a volunteer trail ambassador program coordinated by University of Utah Parks, Recreation, and Tourism in cooperation with local, state, and federal partners including the National Park Service and the US Forest Service. College student volunteers patrol two urban recreation areas in Salt Lake City providing information and education to recreationalists, logging trail conditions via GPS, and recording data about matters of interest to land managers. This poster details program procedures including recruitment, training, equipment management, trail condition data logging, and managing substantial public encounters. The poster illustrates the value of programs like Wasatch Front Urban Rangers that provide a gateway for youth to discover urban recreation areas and provide an opportunity to communicate with the public about stewardship and responsible recreation.

Keywords

youth, urban, trails

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10678 Fasttrack Session

Connecting with Conservation: Youth Urban Archaeology Corps Participants Share their Stories

What will I get out of this?

Instead of talking at youth, this program will create a space for conference participants to listen to them.

**Abstract** 

As cultural resources professionals, teachers, professors, and mentors, we often fall into the trap of talking at young people. This FastTrack will turn this dynamic over, creating a space for the youth to talk to us, and share their experiences as archaeologists and cultural resources stewards through the Richmond National Battlefield Park Urban Archaeology Corps Program. These four participants were part of an 8-week program (for three of the students, for the second time in two years) in 2016, where they conducted archival, archaeological, and oral history research into a community of color within the park boundary. Youth participants will discuss what they learned during the program, what archaeology and cultural resources stewardship means to them, and how participating in a paid youth program to conduct historical and archaeological research has shaped their lives and thinking.

Keywords

youth, archaeology, outreach

Lead author / Session organizer Dania Jordan

National Park Service

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Urban Archaeology Corps

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Urban Archaeology Corps

Urban Archaeology Corps

Establishment of a transboundary MPA network between Grenada and St. Vincent and the Grenadines

What will I get out of this?

A transboundary case of MPA networking as an example for addressing challenges in MPA management capacity involving more partners to protect more ecologically connected areas

**Abstract** 

In 2011, SusGren jump-started the Grenadines Network of MPAs (GNMPA) to strengthen MPA management on the Grenada Bank. Government support was instrumental in the initial establishment of the network and encouraged its growth. Public support is growing over time, and broader stakeholder engagement is being achieved with each community-focused activity. Joint participation in enforcement training is helping the MPAs to more consistently enforce rules and regulations across the Grenadines. Training for MPA staff and stakeholders alike has focused on management objectives and monitoring, and helped to increase biological and socio-economic monitoring by member MPAs. A programme of annual meetings, joint training and inter-MPA exchange visits for both managers and field staff, plus a supporting small grants programme, is serving to increase communications and to share best practices amongst Grenadines MPAs for effective management across international boundaries.

Keywords

Transboundary

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Emma Doyle - Gulf and Caribbean Fisheries Institute, Charleston, USA

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Adopting molecular techniques in wilderness management and restoration in Yosemite National Park

What will I get out of this?

We demonstrated that the presence of live organisms could be detecting using eDNA techniques. Our findings help expand eDNA to be used in restoration projects.

**Abstract** 

Analysis of aquatic environmental DNA (eDNA) obtained from filtered water samples is a promising tool for monitoring invasive species, but application of this method is hindered by the inability to distinguish whether sources are alive or dead. We analyzed how the detection of eDNA from dead and live model organisms (goldfish) differs depending on collection method. We then applied the resulting method in a field setting where non-native fish are being removed to create habitat for endangered species. Our results highlight that collection methods for eDNA can be tailored to maximize the utility of eDNA techniques in aquatic habitat conservation. Yosemite National Park has successfully incorporated eDNA techniques in their aquatic wildlife program. Projects that have adopted these methodologies include bullfrog eradication, non-native trout removal, and red-legged and yellow-legged frog management. eDNA can be used as a complement to traditional methods to increase the efficiency of efforts in wilderness restoration.

Keywords

Restoration, environmental DNA

Lead author / Session organizer

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Rob Grasso is the aquatic ecologist for Yosemite National Park

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Landscape approaches for nature based tourism development, Mt Elgon region of Kenya

What will I get out of this?

Create a model that integrates conservation, culture and community livelihoods with nature based tourism development within the ecological, economic and cultural dimensions of the landscape.

**Abstract** 

Protected areas can be important sources of income through tourism, but for people living around these protected areas, they can be viewed as a source of conflict. The Mount Elgon region is a transboundary ecosystem straddling the Kenya-Uganda border is an area with several protected areas within its diverse landscape. The region has a variable ethno-cultural composition of communities that engage in different livelihood activities revolve around its natural resources and biodiversity whilst competing for limited resources. The research aim is to interrogate landscape to create linkages between cultural heritage, biodiversity conservation and nature based tourism in a multi-functional landscape with divergent land uses by communities found in the Mount Elgon ecosystem. The primary output will be to create a model that integrates conservation, culture and community livelihoods as part of the process of nature based tourism development within the ecological, economic and cultural dimensions of the landscape.

Keywords

tourism, stakeholders, livelihoods

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Daniel I. Rubenstein

Norms and human nature relationships determine boater behaviors that affect the spread of invasive species

What will I get out of this?

This poster will help researchers and practitioners understand the complex interactions between natural landscapes and people who contribute to the spread of aquatic invasive species.

**Abstract** 

Recreational water users such as boaters and anglers are a primary vector of the unintentional spread of aquatic invasive species. Despite its importance, the role of human behavior in preventing the spread of invasive species is not well understood, and is often neglected within the biological sciences. We quantified the factors that shaped individual decisions that affected the spread of invasive species at Chain O' Lakes State Park and North Point Marina, IL. Specifically, drawing on on-site observations and survey data collected from a representative sample of stakeholders, we measured the effects of norms and humannature relationships on behavioral engagement in activities to reduce the spread of invasive species. Results showed respondents performed an array of pro-environmental behaviors, and the distribution of behavioral engagement varied. We found social and personal norms were positively correlated with activities that influenced the spread of aquatic invasive species across two resource management contexts.

Keywords

Invasive, Human, Dimensions

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Lara Browning- University of Ilinois Urbana-Champaign

William Stewart- University of Ilinois Urbana-Champaign

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Snowmelt timing, vegetation phenology, and growing season length in the Oregon Cascades

What will I get out of this?

Phenology, an important climate change indicator, is poorly studied in conifer-dominant ecosystems. We assess snowmelt timing impacts on phenology in Oregon's Cascades with remote sensing

**Abstract** 

Climate change is disproportionately impacting montane ecosystems, particularly snow dynamics. Vegetation phenology is a sensitive ecological indicator of climate change but research in coniferdominated systems is lacking. We used MOD10A2 and MCD12Q2 data products to assess annual snowmelt date and five phenology metrics respectively across nine forest types within Crater Lake National Park, OR from 2001-2012. Snowmelt dates were positively associated with onset of vegetation green-up in most forest types, peak phenology in alpine and subalpine forest, and longer growing seasons in lodgepole and supalpine forests. Ground-based snowfall records show April snow depth from 1931-2015 has declined. Opposite trends during the 12-year period of available MODIS data may be due to changing snowfall patterns of alternating per accumulation-melt cycles and late season snows. Finer spatiotemporal resolution of remote sensing data and ground-based observations that can link physiological processes to satellite data will benefit future efforts.

Keywords

NDVI, phenology, snowmelt

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#### Payment for Environmental Services and Local Protected Areas in Calakmul, Mexico

What will I get out of this?

Biosphere reserves and Payment for Environmental Services programs are criticized for favoring top-down decisions. This study explores how both tools are influencing local conservation.

**Abstract** 

The Calakmul Biosphere Reserve of Mexico was conceived to protect an extensive tropical moist forest. Since the 1980s, over fifty village settlements (ejidos) have been established within the forest margins. The Reserve's existence has had little impact on the land use decisions of most settlers, while NGO and government conservation and development efforts have often worked at cross-purposes. In 2016, the author interviewed leaders of 15 villages, to learn about their own concepts of parks and protected areas. Contrary to expectations, only a few villages set aside land for conservation as a part of local, "organic" process. Instead, a new program of Payments for Environmental Services (PES) implemented by the Mexican federal government is having a direct impact on local conservation, in a way the Biosphere Reserve never achieved. However, most PES-registered set-aside lands were already considered by villagers to be unsuitable for cultivation.

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PES, biosphere, Mexico

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#### Law Enforcement and Crime in the National Park Service's Pacific West Region

What will I get out of this?

Will provide insights on what factors may lead to more or less recorded crimes in US National Parks.

**Abstract** 

To ensure effective management of National Parks it is essential not only to understand the ecologies of these places, but also the enforcement of the rules and regulations within them. Preventing and detecting crimes within US National Parks helps ensure environmental sustainability, as well as political and economic sustainability. Safe and well managed parks foster strong connections between people and place. This paper focuses on law enforcement within the Pacific West Region of the United States where differing geography, human and agency relationships, technologies, and visitor needs all play a role in determining how and in what ways national parks detect and record crime. Using these data, our study seeks to explain why certain parks record more crime than others. The findings from this study help us to provide insight as to what infrastructural, staffing, and programmatic changes parks could make to best detect crimes in the future.

Keywords

Crime; Law Enforcement

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### The National Park Service Ranger as a Historically Contradictory Figure

What will I get out of this?

Learn about the history of law enforcement in the National Park Service and how enforcement strategies have changed over time.

**Abstract** 

Keywords

Ranger; Law Enforcement

The paper traces the complex history of the US Park ranger through time to show how the Ranger as an outward embodiment of state power has been contradicted by administrative and practical logics directing rangers to educate, welcome, and guide park visitors. Rangers' work as territorial enforcers, and as strongarms of the state has been tempered and defined by multiple disciplining forces over time. Using a political ecology approach, this paper examines how shifting political economic contexts, shifts in park use and park visitors, and a changing national law enforcement milieu influenced how and in what ways National Park Rangers have performed law enforcement in US parks over the last 100 years. The paper argues that the mutable history of National Park Rangers' law enforcement practices offers empirical evidence that the militaristic models of conservation around the world can also change.

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10719 Skills Session

#### **RFP Writing 101 for Parks and Cultural Sites**

What will I get out of this?

Participants learn to write an RFP that creates clarity around project goals, scope, and schedule; assists with vendor selection; and leads to better project outcomes.

**Abstract** 

How can you write a Request for Proposals (RFP) that leads to a project that connects people to your site or park? A well-written RFP converts ideas and values into a defined outline of desired actions. In this session, participants will learn how to articulate the need in a way that encourages experienced and qualified people to respond. Participants will learn the importance of various RFP components, develop a vocabulary to convey their needs, practice creating a schedule and technical specifications, and convert their project goals into criteria for evaluating and selecting a vendor. This session will assist agencies and organizations in writing clear and effective RFPs that attract vendors who are a good fit for their project.

Keywords

RFP, Skills, Evaluation

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10722 Challenge Session

#### Lessons on Truth, Reconciliation, and Healing for Parks and Cultural Sites

What will I get out of this?

Understanding the interests and frustrations—the truths—held by the communities with whom we work. What is truth, and whose truth are we talking about?

**Abstract** 

Planning professionals and educators must cultivate an understanding of the interests, concerns, and frustrations-the truths-held by the communities with whom they work. But what is truth, and whose truth are we talking about? The Truth and Reconciliation Commission that emerged during the dismantling of South Africa's apartheid system in 1998 developed four notions of truth as part of a societal healing process: factual truth, personal truth, social truth, and healing truth. These truths should form the fiber of our efforts as professionals. Accounting for these multiple truths has intrinsically valuable outcomes (dialogue and healing) and also instrumentally valuable outcomes such as plans, curriculum, site experiences). We'll discuss three types of engagement within the context of these four truths: interpretive planning & design for historic sites, commemorative event planning, and curriculum development. Presenters will share how their work with African American and Native American communities is seeking to weave these truths into practices that heal historical traumas, into equitable collaborations, and into inclusive storytelling and interpretation.

Keywords

Equity, healing, truth

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Wildlife-human interactions on park roadways: What do we know and where should we go?

What will I get out of this?

This study describes visitor and animal behaviors and visitor management during wildlife jam events in an effort to better inform management of these events.

**Abstract** 

As recreation and tourism in parks and protected areas increases, managers face rising concerns of natural resource and visitor experience degradation. An experience frequently sought in these areas is viewing wildlife. Visitor behavior in prime wildlife-viewing areas often involves visitors parking along roadways and exiting their cars to view wildlife. This creates a phenomenon known as a "wildlife jam". To date, no studies have comprehensively investigated this phenomenon. This study characterizes the nature of wildlife jams along the Moose-Wilson Road in Grand Teton National Park. Global Positioning System and behavioral data were collected for jams that occurred with and without park staff present. Preliminary results suggest that presense of park staff at a jam impacts the duration, extent, and visitor behaviors that occur. Understanding the nature of these jams will enable managers to develop management strategies that minimize the potential negative effects of jams on wildlife and the visitor experience.

Keywords

Visitor-behavior, wildlife-jam, visitor-management

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Deer impacts to vegetation recovering from Superstorm Sandy in overwashes of Fire Island National Seashore

What will I get out of this?

A hyper-abundant herbivore population likely alters the successional trajectory of post-disturbance coastal vegetation and may indirectly affect barrier island resiliency.

**Abstract** 

In 2012, Superstorm Sandy caused unprecedented storm surges and inundation of Fire Island. Many primary dune systems were eroded or overwashed in the Otis Pike High Dune Wilderness Area, leaving inland ecosystems subject to erosion and salt water inundation. We hypothesize that the combination of a high magnitude disturbance in the presence of a hyper-abundant, large herbivore population reduces the rate of vegetation recovery through selective grazing and browsing. Since the storm, we identified an increase in both vegetation cover and primary productivity of overwashes. We used trail cameras to index overwashes in terms of deer use, and documented a gradient in use from the built environment to wilderness. Selective browsing by deer influences vegetation cover and primary productivity, which we will quantify in the near future. Impacts to vegetation of a dense deer population could impact the stability of primary dunes and resiliency of the barrier island system.

Keywords

coastal, resilience, deer

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Using digital point-intercept and sub-meter navigation to assess vegetation recovery in Fire Island's wilderness

What will I get out of this?

Digital point-intercept alleviates the need for permanent vegetation plot placement and reduces time in the field, without sacrificing accuracy or utility of vegetation data.

**Abstract** 

Traditional point intercept (TPI) techniques are sensitive to wind bias, which is exacerbated in coastal environments. We used digital point intercept (DPI) and sub-meter GPS navigation to assess vegetation recovery since Superstorm Sandy in the Otis Pike High Dune Wilderness Area of Fire Island National Seashore. Digital point intercept uses a mounted camera to take high-resolution, nadir photographs of vegetation plots, which are later analyzed digitally. DPI ameliorates wind bias and provides archival images as a permanent record of vegetation cover for future analyses. Sub-meter navigation reduces plot establishment time and eliminates the need for permanent plot markers. We compared results from DPI and TPI for permanent plots established in overwash fans created by Superstorm Sandy. DPI required significantly less field and processing time and exhibited higher accuracy than TPI, as determined using classified vegetation plot images. We determined this combined technique is highly valuable for coastal vegetation assessment.

Keywords

point-intercept, coastal, vegetation

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#### Remote Sensing of Vegetation Diversity Change in Acadia National Park

What will I get out of this?

Remote sensing technology as a monitoring tool for identifying recreation resource impacts at a large spatial scale

**Abstract** 

Keywords

The purpose of this study was to monitor plant diversity changes resulting from recreational uses at Cadillac Mountain Trail Network, Acadia National Park, Maine. In this study, we propose the use of remote sensing technology as a monitoring tool for identifying plant response characteristics. We hypothesized two scenarios that maintain different numbers of plant species (25 and 50 classes) at the target study area by classifying the multiple Normalized Different Vegetation Index (NDVI) layers extracted from 2000, 2005, and 2010 Landsat TMs. Then, the Shannon-Weiner (SW) indices were calculated to compare the vegetation diversity in each class. In addition, T-test was used to compare the SW indices between trail group and non-trail group based on the systematic sampling design. The study will report preliminary results associated with developing a monitoring technique designed to cover a large spatial scale.

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Integration of Scientific, Cultural, and Recreational Values in Invasive Species Management on Maunakea

What will I get out of this?

Overview of an integrated invasive species plan-incorporating diverse cultural practices, land uses, and visitor patterns-in managing public lands and especially scientific research.

**Abstract** 

invasive, plannina, science

The invasive species management plan for the high-elevation Mauna Kea Science Reserve on the Island of Hawaii was approved by the community-based Maunakea Management Board in 2015. The 11,288 acre Mauna Kea Science Reserve is used as a scientific complex in support of astronomical observatories, is a culturally significant site, and is a popular visitor destination. Managed by the Office of Maunakea Management under the University of Hawaii at Hilo, the plan's invasive species prevention measures implement both pathway and species-specific risk management approaches with a suite of risk mitigation procedures, adapted from biosecurity protocols. Pathway analyses led to development of pre-planned responses aligned with traditional cultural priorities. Communication tools highlight the prevention, early detection, and response rationale that guide decision-making processes. Continued adaptation and updates ensure relevancy, address lessons learned, and promotes use such as informing other scientific and recreational invasive species planning efforts in the region.

Keywords	invasive, planning, science						
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Assessing the Cultural Context for Predator Conservation in/around Protected Areas: A Social Suitability Index

What will I get out of this?

Participants will learn about a new cultural index that can be used to inform park and protected area management around the world.

**Abstract** 

Populations of predators are in decline worldwide as human growth and development alters their habitats. Large predators are a tourist attraction in many regions of the world, bringing essential income to governments and local communities. These complex interactions create conflict between humans and predators that greatly impact local communities. Our study focuses on development and implementation of a Social Suitability Index (SSI) that measures the cultural context for predator conservation in a region. We use the SSI to measure social suitability in villages surrounding Maasai Mara National Reserve, Kenya and Dong Van Karst Geopark, Vietnam, and identified factors that influence this cultural context for conservation, including the potential effects of ecotourism-based livelihood strategies. Our analysis, one of the first to directly integrate social and cultural metrics into conservation planning, provides critical information that should influence the protection of both human livelihoods and the lives of predators in/around protected areas.

Keywords

conservation, predators, human\_wildlife\_interactions

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#### **Recreational Suitability Mapping to Address Recreational Conflict**

What will I get out of this?

Attendees will learn how Recreational Suitability Mapping can assists with recreational conflict reduction and resource protection by quantifying terrain and infrastructure preferences of specific recreationists'.

**Abstract** 

As the participation in outdoor recreation grows, land managers are challenged with protecting resources, while providing recreational opportunities. The Lake Mountains is an area of public land managed by the BLM that is south of Salt Lake City, Utah and adjacent to the town of Saratoga Springs and Eagle Mountain City. The area has experienced immense visitor use, 20,000 to 50,000 visitors per year, public safety concerns, trash, and archaeological site damage. Subsequently, researchers administered onsite questionnaires at the Lake Mountains (n = 405) to help managers identify terrain and infrastructure preferences of target shooters, OHV riders, campers, and hikers. Mapping these preferences using GIS techniques in ArcMaps helped land managers properly zone the area for the four types of recreation to reduce recreational conflict and increase resource protection. The presentation will outline management issues, methods, and describe how recreation suitability mapping can assist with resource protection and conflict reduction.

Keywords

**Recreation Suitability Mapping** 

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#### **National Park Teacher Corps**

What will I get out of this?

Exchanging ideas about structuring effective educational partnerships will inspire attendees to participate in a national conversation on engaging teachers and students in place-based education.

**Abstract** 

The National Park Service (NPS), the National Park Foundation (NPF), and the National Park Learning Alliance (NPLA)—a nationwide, professional alliance of educational program providers allied with parks—have come together to ensure that more students and teachers experience national parks as places for learning. Representatives from each entity will be on hand to hear your ideas about how we can build upon the educator resources and programs that are already at work in our parks to establish a scalable, sustainable National Park Teacher Corps. How can we provide professional development for more teachers and leverage their ability to reach additional students throughout their teaching careers? How can we strengthen partnerships between schools and parks and provide more students with in-park learning experiences? We want to hear your ideas!

Keywords

Parks, teachers, education

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Values of front and backcountry users at Denali National Park change across space and scale

What will I get out of this?

Audience members will learn about a new way to approach park management to improve visitor experiences.

**Abstract** 

Activities preferred by visitors to national parks may be partially attributed to the values perceived in a landscape. Understanding the reasons why people believe protected areas are important to stakeholders is crucial to improving park management decisions. This study drew on survey data collected from visitors to Denali National Park and Preserve that involved a mapping exercise. Respondents were asked to allocate 100 points to 13 values ranging from tangible (e.g. economic value) to intangible (e.g. aesthetic) qualities of place. Results showed a stark difference in the point density and distribution of values assigned by front and backcountry users. Generally, backcountry users allocated a smaller number of points to a broader range of values, whereas frontcountry users assigned larger numbers to fewer values. This information can be used to facilitate better management practices and improve visitor experiences by focusing management on activities that appeal to an array of stakeholder groups.

Keywords

values, behaviors, management

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Huika'i 'Olelo o Hawai'i: Lessons from the 2016 IUCN World Conservation Congress

What will I get out of this?

This session will connect participants to outcomes of the largest global conservation event ever convened in the United States.

**Abstract** 

The largest conservation event on the planet exceeded all expectations during the meeting of the International Union for the Conservation of Nature (IUCN) in Honolulu, Hawai'i, USA. The number of participants also exceeded earlier Congresses, held every four years: over 10,225 people from 193 countries. As host country the United States set a high bar with arguably the best organized global IUCN conference to date. Many of the challenges that were covered are present in the microcosm in the Hawai'ian Islands, including biosecurity, indigenous issues, endangered species, and marine and ocean stewardship challenges. The session will explore continuing opportunities for biocultural connectivity that the conference brought forward.

Keywords

**World Conservation Congress** 

Lead author / Session organizer

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Brief Perspective on the WCC, the Ever-evolving Global Conservation Agenda, and Protected Area Governance

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Hawai'i Holds Many Lessons for the World

The Promise of Sydney After Honolulu

Connecting Nature-Culture for More Effective Conservation

Connecting Nature-Culture for More Effective Conservation

10910 Compass Session	Traditional Science: What is its Place in Protected Area Management Today?
	This session will explore the role of traditional science in protected area management today.
nat will I get out of this?	
Abstract	This session will explore the role of traditional science in protected area management today.
Keywords	traditional science
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10908 Challenge Session

# The Rabbit in the Mouth of the Coyote: Indigenous Employees in the Service of Government

What will I get out of this?

Indigenous audience members will have the chance to explore the delicate topic of divided loyalties; non-Indigenous participants will hopefully come away sensitized to this situation.

**Abstract** 

Indigenous employees occupy various levels of government from junior ranks to some of the more senior levels. Joining a parks service, be it federal, state or provincial, is both a way of bringing a person's culture and history to their work while at the same time creating a dual dynamic for many Indigenous employees: seen as an outsider with priority interest for Indigenous peoples by their colleagues as well as seen as a sell out by their community. This session will explore this dynamic and allow Indigenous peoples to share their experiences of wearing the 'colonizers' uniform.' It will tackle the racism both from within and without the parks services and hopefully offer a brighter more inclusive future for Indigenous employees in the years to come.

Keywords

Indigenous employees; racism

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10871 Update Session

#### Because it's 2017: Parks Canada Perspectives

What will I get out of this?

This panel will present a snapshot of the work Parks Canada Agency has undertaken to not only our Canada's 150th anniversary year but also to look to the future of the heritage places in Canada.

**Abstract** 

Connecting people to places in the Parks Canada Agency context touches many aspects; from Indigenous Peoples' engagement in the establishment and management of heritage places and traditional territories, to Canadians and visitors experiencing the many historical voices and narratives of our special places, to adapting our landscapes to new infrastructures, and to welcoming New Canadians to our heritage places through innovative programs such as the Learn to Camp Program. For more than a century, Parks Canada has continued to advance one of the finest and most extensive systems of protected natural places in Canada and fostered the designation of cultural heritage places for all Canadians through protection and presentation. Now, in 2017, as Canada celebrates the 150th anniversary of Confederation and the 100th anniversary of National Historic Sites, join this panel of Parks Canada team members who will be presenting a snapshot of the work the Agency has undertaken to not only mark this important year but also to look to the future of heritage places in Canada.

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Reconnecting Indigenous Peoples to Traditional Lands

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Establishing New National Parks and Protected Areas: Connecting People to Canada's Heritage Places

Re-thinking the Stories of Canada: Connecting people, places and time in one national narrative

Learn to Camp Program: Connecting New Canadians to Parks Canada Heritage Places

Western Highways Corridors: Adaptation and challenges for preserving the cultural landscape tools

Linking nature-based recreation and pro-environmental behavior: empirical support for the Conservation-Recreation Model

What will I get out of this?

This presentation explores links between nature-based recreation and conservation behavior and discusses the implications of connecting people and places to enhance protected area management.

**Abstract** 

Efforts to conserve the health and viability of parks and protected areas may ultimately depend on functional and emotional connections between people and their environment. Nature-based recreation fosters many of these connections, potentially leading to engagement in multiple forms of proenvironmental behavior (PEB). This study used a structural equation modeling approach to empirically investigate hypothesized associations among nature-based recreation, sense of place, and PEB. Data were collected in spring 2013 via surveys of landowners (n=387), licensed hunters (n=227), and avid birders (n=646) across several counties in upstate New York. Results showed that participation in birding and hunting was a significant positive predictor of PEB. This relationship was partially mediated by the effect of recreation participation on place attachment and community involvement. The study highlights the potential value of the Conservation-Recreation Model as a mechanism for illuminating the direct and indirect contributions of nature-based recreation to park and protected area management.

Keywords

Behavior, Conservation, Recreation

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What will I get out of this?

Attendees will learn spontaneous, audience-centered, experiential, interpretive techniques that specifically address how to adapt interpretive programs to changing budgets, emerging issues, and evolving audiences.

**Abstract** 

A new paradigm in interpretation is necessary. Parks face numerous changes. Budgetary, societal, political, and demographic changes challenge interpreters to rethink our approach. In response to less staff, new audiences, an increasingly individualistic culture, evolving technology, and expanding shared authority Pinnacles National Park has changed how, where, when, and why they deliver interpretive programs. The approach is to create spontaneous, audience-centered experiences. The program is spontaneous; it does not require them to be at a specific location and time. It is audience-centered. Regardless of topic, techniques maximize emotional, creative, and experiential input from the visitor. The program moves beyond interpretation to provide the visitor a formative experience. Examples include journaling chairs in the backcountry, "ask it forward cards" (un-facilitated facilitated dialogue), and a tournament of challenges. This approach is effective at reaching all audiences, building relevancy, and creating connections. The methods are replicable, and results are quantifiable at any unit.

Keywords

relevance, connections, inclusion

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Second Century Thinking: Research to Support Interpretation, Education, and Engagement

What will I get out of this?

The session will explore state-of-practice research designed to support desired outcomes and enhanced effectiveness of interpretation, education, and engagement programs.

**Abstract** 

Key elements of the Second Century Commission's recommendations to "advance the 21st-century National Park idea" include: affirming that the National Park Service has a fundamental role to play in American education; strengthening connections between the national parks and educational institutions; helping the public to build personal connections to the national parks; and engaging diverse audiences. This session will explore the ways in which research is being applied to help inform and support interpretation, education, and engagement objectives within the National Park Service and beyond. A primary goal of the session is to provide a venue for scientists and practitioners to discuss challenges and opportunities for building within society strong connections and sense of engagement with National Park Service programs and places.

Keywords

Interpretation, Education, Engagement

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The Inspiring a New Generation Summit: Findings from Census-building Workshops on Engaging Children with Parks

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Influencing Youth Behavior and Nature Engagement Through Leave No Trace Education

Education and Interpretation in the Lab: Simulated Soundscapes' Role on Memory, Attention, and Personal Reflection

What Makes an Environmental Education Program Successful? Defining Success and Studying What Leads to It

Evaluating the Effects of Crowding on Interpretive Experiences at Castillo de San Marcos National Monument

Looking back and Creating A Vision -Natural Resource Science, Stewardship, and **Leadership Beyond the Centennial** 

What will I get out of this?

What does it mean to our focus for science and stewardship and DO# 100 implementation?

**Abstract** 

This session and dialogue will take a brief look back at the last few decades of natural resource stewardship within the National Park Service, lessons learned, and discussion of a path forward. What does it mean to our focus for science and stewardship and DO# 100 implementation? How will we embrace new technologies and approaches to stewardship? We will highlight how science and scholarship have shaped the past of national park natural resource management, and provide a forward look at the next century of collaborative science and scholarship in America's national parks. Session will feature current and past Associate Directors and Chief Scientists of Natural Resource Stewardship and Science, and forwardthinking Superintendents and park managers and collaborators.

Keywords

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**Directors Order Natural** 

Lead author / Session organizer Elaine Leslie Taking a Look Back While Creating A Vision Forward-Natural Resource Science,

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Moving from the Thinking Phase to an Implementation Plan for a Landscape Approach to Conservation

What will I get out of this?

How do the NPS, other agencies, and private land managers, partners, and neighbors contribute to a National Conservation Strategy - we connect resources at scale.

**Abstract** 

How do the National Park Service (NPS) and other federal, state and private land managers, partners, and neighbors contribute to a larger National Conservation Strategy? This would be a strategy that uses best available science, and builds from the core of already protected areas to ensure that we act upon the conservation of our national natural heritage today and well into the future. What is needed now, is not just a cohesive and comprehensive approach for a cornerstone strategy, but proof of concept projects implemented on the ground that embrace and exhibit concepts of connectivity and landscape level principles. For the NPS, it requires expanding beyond our constructed boundaries within the states as well as reaching out to our trinational partners-using new technologies and strategies in a more unified approach to continental conservation.

ad	author/	

Keywords

large landscape conservation

Le Session organizer

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## Native Wildlife and Ecosystem Health-What are the Facts About Impacts from Feral Cats?

What will I get out of this?

Without many precedents and with a volatile topic among stakeholders and employees, the NPS is attempting to deal with feral domesticated cat-wildlife interface issues.

**Abstract** 

Keywords

and titles of their presentations are given here feral cats, domesticated

Feral and free-ranging domestic cats are exotic and invasive species to North America and are responsible for the extinction of numerous mammals, reptiles, and as of 2013 at least 33 bird species. Effects of cat predation and disease spread are most pronounced in island settings, where populations of wildlife are already low or stressed by other factors. Effects are also significant in natural and urban areas where cat colonies become established. Although there is clear policy to inform NPS management of its responsibilities toward exotic and invasive species, many parks have been unable to navigate this issue due to volatile and contentious debate surrounding free-ranging domestic cat management caused by concerns associated with wildlife conservation, cat welfare, and public health. As a result, many parks have reached out to the Biological Resources Division (BRD) and regional offices seeking guidance. This contemporary conservation issue has few precedents to draw from.

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#### **NPS Strategic Invasive Animal Science Workshop**

What will I get out of this?

Invasive species are the second most significant threat to biodiversity, after habitat loss. Help the NPS determine a strategic servicewide approach to this pervasive issue.

**Abstract** 

Invasive species are the second most significant threat to biodiversity, after habitat loss. In their new ecosystems, invasive species become predators, competitors, parasites, hybridizers, and diseases of our native species. It makes sense then, that invasive animals are a mission-critical issue for the National Park Service (NPS) due to their wide-ranging, detrimental impacts on NPS resources. Despite the fact that almost every NPS unit with land and water to manage is being affected by invasive animals, the NPS has yet to develop a servicewide strategic approach to invasive animals. This piecemeal approach is utilizing increasingly larger levels of funding and personnel, yet is not an effective strategy. This session will evaluate the extent of the problem, assess NPS' management needs for invasive terrestrial vertebrates, review existing case studies and identify the potential for new studies, and review organizational models that could serve as a servicewide organizational framework for NPS.

Keywords

Invasive animals, NPS

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Kent Redford-Session Facilitator

## NPS Strategic Invasive Animal Science Workshop (INVITE ONLY 1.5DAY Workshop)

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Keywords

Invasive animals, NPS

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**Independent Science Team** 

Invited Speakers

Channel Islands National Park, Superintendent

**Invasive Species Coordinator, DOI** 

Pacific Island Network Inventory and Monitoring Program, NPS

Chief of Biological Resources, NPS

#### **Novel Approaches for Monitoring Solitude in Urban-Proximate Wilderness Areas**

What will I get out of this?

Attendees will learn the ways in in which GPS technologies and GIS analyses can better inform management decisions concerning solitude monitoring in designated wilderness areas.

**Abstract** 

The 1964 Wilderness Act states that wilderness "...has outstanding opportunities for solitude...". However, designated wilderness areas in close proximity to urban areas pose challenges for finding and evaluating opportunities for solitude due to increased visual and auditory encounters with other visitors. This study advanced the minimum protocols for evaluating opportunities for solitude in three urban-proximate wilderness areas in Utah (Uinta-Wasatch-Cache NF) by employing and aggregating information from GPS technologies, infrared trail counters, visual assessments, and sound scape assessments in addition to traditional encounter data. Findings were analyzed and substantiated using GIS technologies. This spatially explicit and integrated process provides new contributions to understanding visitors' senses of solitude in urban-proximate wilderness areas. We conclude with recommendations for applying these approaches to other wilderness areas and in other visitor use management situations.

Keywords

Soundscapes, GIS, Viewsheds

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10947

Pensacola Bay Ferry: Resilient Transportation and Tourism at Gulf Islands National Seashore

What will I get out of this?

Learn about the planning for Gulf Island National Seashore's new ferry service and the critical role it will play for local transportation and tourism.

**Abstract** 

A passenger ferry in Pensacola Bay has been a long time in the making. As part of the restoration actions after the Deepwater Horizon oil spill, funds were appropriated for the purchase of two ferry vessels for the Pensacola Bay. Since then, Gulf Island National Seashore has been working closely with local partners to establish the ferry service. Access to the Fort Pickens area of Gulf Island National Seashore is currently via a road that is extremely susceptible to closure due to flooding and/or storm damage. Further, the primary route from Pensacola to Santa Rosa Island, the barrier island on which Pensacola Beach and Fort Pickens are located, is via a bridge that is often congested. As such, implementing a ferry service for this area provides a new way to travel between and experience key locations in the Pensacola Bay area and, in doing so, improves resiliency of the community.

Keywords

resiliency, ferry, feasibility

Lead author / Session organizer

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NPS NEPA Reviews: Concise, Focused, and Timely?

What will I get out of this?

Learn about the 2015 NPS NEPA Handbook. This poster reflects on elements successfully and easily adopted for more concise, focused, and timely NEPA documents.

**Abstract** 

In this poster, VHB's NPS NEPA team reflects on the documents being prepared under the new NPS NEPA Handbook. This policy was released in September 2015 with guidance for more concise, focused, and timely NEPA reviews. To that end, the revised guidance for writing NEPA documents includes the opportunity to streamline or even eliminate components from the document. VHB's team has found that there are some document elements that have been readily and successfully streamlined in light of these updates, while additional opportunities sometimes remain. The challenge facing each planning team is creating very concise documents with only the information that is needed to convey the proposed action and assess the potential impacts. This poster presents a synthesis, from VHB's perspective, of how project teams have embraced the new changes since the new guidance was issued, and where old habits die hard.

Keywords

NEPA, planning, streamlining

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Reverberations in Soundscapes at the Interface Between Indigenous Peoples and National Parks in Southwest USA

What will I get out of this?

This is original research being conducted with the Hualapai on Native American soundscape perspectives. It is key to understanding future park management decisions.

**Abstract** 

The National Park Service recognizes the inherent value of preserving or sustaining its natural and cultural soundscapes as a priority for the continuation of the overall park experience. These aural collections are rich and diverse spanning numerous ecotones. In the late 1980s, the Hualapai Nation decided to grant controlled access to its lands. It was here that visitors could enjoy the Grand Canyon experience without the continuous flow of large crowds often seen at the North and South Rims. This research focuses on Native American perspectives with respect to 'natural quiet' and 'natural soundscapes' at cultural or sacred sites in the Grand Canyon. Literature is limited, gaining knowledge on the significance of 'Place,' beliefs systems, and the role that soundscapes play in traditional and religious practices is key to understanding current and future management decisions; while maintaining mutual respect for long standing tribal presence, cultural histories, traditions, and knowledge systems.

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Soundscapes, Cultural Sites

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# Applying Varied Coding Techniques to Ethnographic Analysis

What will I get out of this?

This poster will outline how NCR Cultural Anthropology applies different coding techniques to interviews/oral histories and how coded data is used in regional projects.

**Abstract** 

Keywords

authors

ethnography, qualitative data

Interviewing stakeholders is one of the primary ways that data is collected by NPS cultural anthropologists. However, data from transcribed interviews often remain in a narrative structure and only find use in a narrow qualitative domain. The Cultural Anthropology program in the National Capital Region has found some success in taking a multi-method approach to research design and data analysis. Interviews are coded to provide data for formal inductive statistical analysis using descriptive, bivariate and multivariate techniques. In addition, this coding technique allows for the integration of GIS generated data sets into the overall analysis by providing not only mapping products but also graphic connections between spatial anchors, individuals, and social and behavioral attributes.

Lead author /	Noel Lopez	Cultural	Anthropologist
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thors / organizers			

#### FOREST VEGETATION FOLLOWING NATURAL DISTURBANCE EVENTS ON PRESERVED LANDS

What will I get out of this?

Human disturbance of forests is associated with the spread of invasive organisms. What threat might natural disturbance events pose to our forests?

**Abstract** 

Land preservation, a key element of conservation biology, consists of the effort to protect habitat from human-caused threats such as fragmentation, development, species loss, and the encroachment of alien invasive plants (AIP). The establishment and expansion of AIP are closely associated with human disturbances such as logging, mining, road construction, agriculture, horticulture, and development. Not only are humans often responsible for the disturbances that facilitate AIP invasion, we often are directly responsible for the dispersal of AIP into these areas through propagule transport. Does the removal of human disturbances through land preservation limit the establishment and expansion of AIP? We examined the impacts that two severe storm systems had on long-term vegetation monitoring plots to study if AIP move into these naturally disturbed areas.

Keywords

Invasive, Plants, Disturbance

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10459 Update Session

# Enhancing the Sustainability of Visitor Use Management through the Application of Recreation Ecology Research

What will I get out of this?

Participants will learn the latest recreation ecology research findings and their implications for the sustainable management of park visitation.

**Abstract** 

This session presents recent recreation ecology research findings that describe common visitor impact management problems caused by trail use, camping, and rock climbing. Insights into the effective management of these problems will be communicated by describing recent research findings about the measurement of visitor resource impacts and the relative influence of use-related, environmental, and managerial factors. The focus of the research and presentations will be on sharing scientific findings and management implications that inform park managers about effective and sustainable visitor use and impact management strategies and practices.

Keywords

recration, impacts, VUM

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**Jeffrey Marion** Recreation Ecologist

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Recreation Ecology Research and Geospatial Applications to Enhance the Sustainability of Trails

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

Recreation Ecology Research to Enhance the Sustainability of Primitive Camping

Recreation Ecology Research to Enhance the Sustainability of Rock Climbing

Successful Applications of Recreation Ecology Science in Enhancing the Sustainability of Park Visitation

10971

Biodiversity Information Serving Our Nation (BISON): Providing species occurrence data for the U.S.

What will I get out of this?

Users will learn about the BISON web-based resource they can use for finding species occurrence data for their protected areas in the United States.

**Abstract** 

Biodiversity Information Serving Our Nation (BISON) <a href="https://bison.usgs.gov">https://bison.usgs.gov">is a data repository with free and open access that allows users to find, explore, and download occurrences of species found in the United States via the BISON web portal and web services. BISON currently contains more than 261 million species occurrence records from diverse sources, which can be accessed by searching for a species at the national, state or county level, or by defining a polygon for an area of interest. Search results can be viewed online as point locations in a map and as checklists and downloaded to the user's desktop. BISON enables the discovery and use of data otherwise not known to those working on protected areas, since checklists of species found within national park boundaries have a greater number of distinctive species when data from BISON is included than when it is not for example.

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species, occurrences, data

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10701

**Evaluating Diverse Trail Projects Using Standardized Assessment Tools: Conservation Corps Example** 

What will I get out of this?

Describes standardized assessment protocols to evaluate trail work conducted by conservation corps across diverse habitats, supporting environmental evaluation and outcome communication for public land resources.

**Abstract** 

The effects of conservation corps programs on participants are well documented, with service-learning involvement leading to increased community engagement, positive attitudes toward public lands, and broad social, health, and economic benefits. However, evaluation of environmental outcomes is less documented due to the diversity of projects and habitats in which crews work. Evaluation contributes to national-level assessment of improved ecosystem health, increased accessibility and public lands usage, enhanced visitor experiences, and promotion of human health outcomes. As part of a collaboration with 14 conservation corps working across the U.S., this project developed standard assessment protocols for trail maintenance and construction projects on public lands. This paper provides an overview of a multi-corps and research institution collaboration, description of the protocols development and associated training materials, and results highlighting the environmental changes associated with corps work. Tangible outputs also include how these protocols could fit other programs or nature conservation goals.

Keywords

Conservation, Corps, Evaluation

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Using social media data to identify valued recreation resources and inform climate change adaptation planning

What will I get out of this?

An innovative, rapid, low-investment assessment of recreation resources using hashtagged images reveals key components of visitor experiences and may inform climate change adaption planning.

**Abstract** 

Climate change will impact the natural resources within parks and protected areas, which will potentially alter the recreation opportunities and beneficial outcomes obtained by visitors. Given the uncertainties of climate change and its associated impacts, managers need to better understand visitor perceptions of key recreational resources and experiences. Researchers typically employ survey research as the primary tool to collect visitor insights. Less understood is the role social media data can play in enhancing managers' understanding of key recreation resources for visitor experiences. Social media posts provide a free, readily available, up-to-date and site-specific account of recreationists' preferred resources and settings. This paper will present the methodology, results, limitations, and implications of using social media data to inform park and protected area planning. Managers should be able to apply this inventive method of assessing key resources to their recreation sites.

Keywords

recreation, adaptation, social-media

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Aquaculture in Coastal Parks: Growing out of Control?

What will I get out of this?

Participants will understand the implications of aquaculture for park resources and explore technical and policy approaches to address it.

**Abstract** 

Keywords

coastal, fish, planning

Several coastal parks confront a legacy of shellfish aquaculture, while other parks are viewed as potential areas for development. As state agencies and NOAA continue to aggressively promote shellfish aquaculture, more parks will face pressure to allow it on their submerged lands and waters. Is shellfish aquaculture environmentally sustainable, as proponents claim, or is it a source of conflicts with recreation, pollution, habitat damage, disease and invasive species that must be avoided? How do parks confront the problem of unauthorized aquaculture already established within their boundaries, or deal with proposals to create new leases and operations? Are there ways to manage aquaculture to harmonize this commercial use with park purposes when part of a cultural landscape? This presentation will explore case studies where these questions arose, and invite discussion of this emerging issue.

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10744 ration Session	National Park System Planning: A Canadian and American Perspective
get out of this?	Investigating and identifying potential actions that the National Park Service and Parks Canada could take update or revise their respective national park system plans.
Abstract	As Parks Canada and the National Park Service just initiated discussion on the possibility of this topic per discussions with Dave Harmon, a more formal and complete proposal for a combination Compassession PLUS Collaboration Session will follow.
Keywords	park system plan
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10741 Compass Session

# **Expanding National Park Systems: Perspectives from America and Canada**

What will I get out of this?

Explore potential collaborative between NPS and Parks Canada to update or revise their respective national park system plans.

**Abstract** 

In the early 1970s, both the National Park Service and Parks Canada adopted a national park system plan to systematically guide the expansion of their respective networks, with a focus on national significance and representation. The purpose of this workshop is to summarise the system plan of each organization and basic establishment process that each country utilise. Presentations will also highlight what has been accomplished to date, the challenges and lessons learned in using a system plan, and what the future may entail. For example, the National Park Service has been working to update its system plan, while Parks Canada will need to decide how to best update and complete its national park system plan to ensure it is grounded in 21st century conservation science. Given the global need and challenges for large-scale landscape conservation, the workshop will also explore opportunities for collaboration amongst two of the planet's earliest national park services.

Keywords

park system plan

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Raymond M. Sauvajot, Associate Director, NRSS, National Park Service

# **Establishing New National Parks and Protected Areas: A Perspective from Canada**

What will I get out of this?

There are lessons to be learned from Parks Canada's ability to significantly expand its national park and marine conservation area systems.

**Abstract** 

The creation of new national parks and protected areas is a political decision. Since 2003, the Canadian government has authorized the establishment of seven new national parks totaling 82,437 km2 and two new marine conservation areas totaling 14,380 km2, as well as significantly expanding several existing parks by almost 32,000 km2. This has been accomplished as a result of several factors including the involvement of Indigenous Peoples and provincial and territorial governments, federal budgets that fund system expansion, strong support from environmental groups, support by specific commercial interests, and continuing traditional land uses by non-Indigenous populations under certain conditions. This presentation will summarize these accomplishments, the techniques used to secure this legacy, and the lessons learned from this work. It will also identify future protected areas that will be added shortly to the system.

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Canada, establishment, Indigenous

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10606 Fasttrack Session

# Planning for resource protection and visitor use in Brazilian national parks

What will I get out of this?

The USFS and NPS collaboration in Brazil provides a novel approach to efficiently and strategically plan for the future protection and use of conservation areas.

**Abstract** 

The US Forest Service (USFS) invited the US National Park Service (NPS) to assist with recent efforts for general management planning for the conservation system of Brazil, managed by the Instituto Chico Mendes de Conservacao da Biodiversidade (ICMBio). ICMBio identified the NPS planning process to develop "foundation documents" as an excellent starting point for building new management plans and adapting to the Brazilian legal framework in order to meet the needs of federal conservation units. Over the course of the past two years, NPS has assisted the USFS with several organizational and teaching workshops and two pilot projects to apply this new approach to general management planning in two very distinct Brazilian conservation units- Sao Joaquim National Park and Soure Marine Extractive Reserve. Lessons were learned that can be applied to general management planning for land management in the United States and globally.

Keywords

international, conservation, planning

Lead author / Session organizer Sarah McPartland Visitor Use Management Specialist

Setting the context: Federal land management in Brazil

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10802 Fasttrack Session

Social Science and Planning: Applications in the National Park Service

What will I get out of this?

To provide context for how and why the National Park Service incorporates social science research into Visitor Use Management planning.

**Abstract** 

Planning for and managing visitor use is at the heart of the National Park Service mission. Proactively planning for visitor use supports responsive management that increases the ability of the NPS to encourage access and maximize visitor opportunities. This planning process is greatly informed by a variety of social science information that is often collected within the context of specific planning efforts. During this session a brief overview of NPS visitor use management planning will be provided followed by individual presentations on four topic areas where social science information is highly applicable to visitor use management planning: decision space, civic engagement, data types, and data integration. Each presentation will explore critical questions relating to the role of social science information within each topic. As a collective they tell the story of how data is used in planning from project initiation to preparing a final document.

Keywords

Planning, Social Science

Lead author / Session organizer Susan McPartland Visitor Use Management Specialist

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Establishing a decision space: identifying planning issues, project scope, and research questions

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Civic engagement: beyond involvement and into social science information

Sliding scale of data types: identifying what is needed and in what format

Putting it all together: integrating data into the planning process

10627 Update Session National Parks as Part of a Broad National "Learning Ecosystem"

What will I get out of this?

Participants will be inspired to collaborate within and outside the NPS to extend the contribution of NPS science and history to the learning ecosystem.

**Abstract** 

Sources of information on environmental and social issues are expanding rapidly with the rise in popularity of social media and other online news outlets. Information consumers need critical thinking skills to recognize biased or false claims. The National Park Service is well-positioned clarify these issues in the context of the parks. As a part of a larger learning ecosystem, the National Park Service contributes to the national dialogue about complex environmental and social issues by presenting science- and history-based understanding of issues, helping audiences understand how we know what we know, being inclusive of traditional knowledge, and reaching out to a diverse array of audiences. This session will explore the role of park science and history in the learning ecosystem through place-based opportunities and partnerships; examine the challenges and opportunities faced by innovators; and inspire creativity to expand what the National Park Service can accomplish in support of this important role.

Keywords

science, history, learning

Lead author / Session organizer

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10751 Update Session

## Socio-Economic Monitoring Developments in the National Park Service

What will I get out of this?

The NPS is challenged now more than ever with issues of relevancy and visitor management. Socio-Economic monitoring describes existing conditions and evidence for decision making.

**Abstract** 

The National Park Service (NPS) recorded over 307 million recreation visits to park units in 2015. This record level of use demonstrates the public's interest in national parks and coincides with the NPS centennial year efforts. Despite the apparent success of increasing overall use of park lands, it is difficult to measure the broader benefits and implications. Socio-Economic Monitoring (SEM) data can provide evidence to inform a wide range of visitor experience and service issues. This session will highlight a wide range of developments and refinements that are collecting park visitor and public information for the NPS. Reaching new and more diverse audiences, accurately counting park visitation, and understanding the economic benefits to local communities and the nation as a whole from visitation and tourism as stated in A Call to Action start with understanding existing socio-economic conditions and tracking trends of NPS visitors and non-visitors alike.

Keywords

**Socio-Economic Monitoring** 

Lead author /
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The Need for Comprehensive Socio-Economic Monitoring for the National Park Service

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The National Park Service Comprehensive Survey of the American Public: Past, Present and Future.

Development and Pilot Implementation of an In-park Socioeconomic Monitoring Program

Socio-Economic Monitoring Data for Visitor Spending Effects Modeling

Counting on visitors: Monitoring National Park Service Visitation through the Public Use Statistics Program

# Outside Science (inside parks): Students Engaged in Science in National Parks

What will I get out of this?

Viewers will be inspired to think about ways to involve students and young professionals in scientific activities and to communicate science through digital storytelling.

**Abstract** 

Keywords

Invited Speakers or a Panel Discussion,

additional speakers/panelists and titles of their presentations are given here social media, science

Sara Melena Education Specialist

Outside Science (inside parks) is a webisode series highlighting science in parks. Traveling from the mountains of Denali, to the saltwater marshes of Cape Cod, to the caves of Buffalo National River, and the beaches of Padre Island, this series follows students of all ages, from grade school up through Ph.D programs. Outside Science (inside parks) aims to inspire the next generation of conservationists by reaching them where they are—on social media—and showing them that nature is awe-inspiring, fun, and worth protecting. This program also proves how parks are ideally situated as classrooms and laboratories to study significant ecological challenges, like climate change, biodiversity, invasive species, and habitat fragmentation.

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	Brittni Connell
	Assistant Web Manager
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10648
Collaboration Session

The Goldilocks Syndrome and Park-based Science—Brokering outreach opportunities that are just right

What will I get out of this?

Guidelines: setting expectations so that park-based researchers' work builds staff resource knowledge and increases the visibility of the park as a research setting.

**Abstract** 

This session brings to light the practices parks use to insure that staff and visitors benefit from the park-based research scientists propose and conduct. Like Goldilocks, we tend to encounter expectations of scientists or parks that are too big and too small, at times too ambitious and at times unnecessarily limited. What are the questions we ask of ourselves and researchers to get it just right? Presenters share how they have shaped opportunities for scientists to reach an audience of park staff, neighbors, and visitors. The goal is to make outreach a routine, standard part of scientists' experience in parks with options that fit the park's needs as well as scientists' varied skills and interest. Participants will use presenters' vignettes of more and less successful efforts as a springboard for articulating guidance for park staff interested in making agreements and arrangements on collaborative efforts with scientists.

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Martha	Merson	Project Director		
iSWOOI	e at TERC	martha_merson@terc.edu		

## iSWOOP, Interpreters and Scientists Working on Our Parks

What will I get out of this?

Park leaders can play a gate-opening role in facilitating communication about park-based science between interpreters, scientists, and the public. Presenters will highlight promising strategies.

**Abstract** 

Research in parks is vital. Though scientific research often uses cutting-edge methods, requires acts of courage, involves determination and persistence to arrive at startling results, these stories are not always visible or obvious to the public. iSWOOP offers promising strategies for increasing the prominence of park-based research. Presenters will speak to preliminary findings about the usefulness of research briefs, field work conducted by interpreters led by scientists, and the role for data visualizations. iSWOOP is aligned with the 21st century interpretive competencies.

Keywords

science, communication, relevance

Lead author / Session organizer

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Additional authors / organizers

One or more of the following will join me:

Tracey Wright, TERC, Research Associate

Nickolay Hristov, Winston-Salem State University, co Project Director

Louise Allen, Winston-Salem State University, coProject Director

Abe Miller-Rushing, Acadia National Park, Science Coordinator

Marc Albert, Boston Harbor Islands National Park Area, Stewardship Program Director

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10686 Update Session

# Multi-Scalar Approaches to Addressing Climate Change Impacts on Cultural Heritage

What will I get out of this?

This session will bring together NPS programs and partner institutions to discuss ongoing scaled-approaches to assess climate change impacts on cultural heritage.

**Abstract** 

Recent NPS work clearly recognizes multiple connections between cultural heritage and climate change. These can be summarized as "impacts on cultural heritage from climate change and capacity to learn from cultural heritage about human history with variable climates and environments." While both connections are essential to climate change response, it's difficult to learn from heritage that has been damaged or destroyed. Therefore, this session takes a dive into understanding impacts of climate on cultural heritage. The session will set out a multi-scalar view of current practice – How are heritage materials being affected by climatic changes? How are we assessing impacts at the field/resource level? at the regional level? at the national level? The session will then ask the audience: What next? How do we continue to grow and interrelate these efforts to ensure that stewardship of cultural heritage is strong enough to meet challenges projected by climate change?

Keywords

Climate Change; Heritage

Lead author / Session organizer Lauren Meyer Vanishing Treasures Program Manager

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Additional authors / organizers

Marcy Rockman, Climate Change Adaptation Coordinator for Cultural Resources, National Park Service

Zoom Out: Cultural Resources and Climate Change at the National and Global Scale

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

Navigating Cultural Landscapes in the Era of Climate Change: Lessons from Western National Parks

Climate Change Vulnerability and Risk Assessment Framework for Cultural Resources in NPS Intermountain Region

Climate Change Impacts on Cultural Materials

A Future for Fort Union: Preserving Adobe Ruins in an Age of Climate Change

10700 Challenge Session

# Brainstorm solutions to challenges facing a new park unit here in Hampton Roads, Virginia

What will I get out of this?

Discuss creative ways that Fort Monroe National Monument, partners, and community members can outline an inclusive and sustainable future for this new national park unit.

**Abstract** 

Fort Monroe National Monument in Hampton Roads, Virginia, joined the national park system in 2011, with lands and property acquired from the US Army in 2015. Today the park faces challenges common among new NPS units and illustrative of the complexity of partnerships. Old Point Comfort, the peninsula upon which Fort Monroe National Monument sits, is managed cooperatively by the National Park Service, the Commonwealth of Virginia through Fort Monroe Authority, and the City of Hampton. The park superintendent invites conference attendees to participate in a creative brainstorming session to generate possible solutions to challenges involving different perspectives among partners, engaging new audiences through inclusive outreach, and connecting people to the significant and relevant American stories of the place and the natural and cultural resources of Fort Monroe. Conference attendees are invited to attend an orientation tour of Fort Monroe the evening prior. For more information, please visit nps.gov/fomr.

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Partnership, relevancy, fort

Lead author / Session organizer Carrie Miller Cultural Resource Specialist

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Additional authors / organizers

Superintendent of Fort Monroe National Monument / A Brief Overview of Fort Monroe National Monument		

Virtual Visitors: Social Media in Yellowstone National Park.

What will I get out of this?

Understanding of why people are using social media to interact with national parks and how millennials differ in their preferences and interactions.

**Abstract** 

Social media is ubiquitous in society today and shows no signs of slowing down. Many organizations have been trying to benefit from the large number of people using this communication tool. The National Park Service (NPS) is no exception to this. For the NPS, social media is a tool that can be used to engage, interpret, and communicate with people. However, we know next to nothing about the people who "like" national park Facebook page, which are called "virtual visitors". This research begins to uncover the characteristics, motivations, and preferences of these virtual visitors. Additionally, comparisons are made between younger "millennial" and non-millennial virtual visitors to evaluate how social media may be impacting different audiences. A survey conducted on Yellowstone National Park's Facebook virtual visitors is used as a case study in this research.

Keywords

socialscience, social media, education

Lead author / Session organizer

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Social Science Perspectives on Human-Bison Interactions: A Comparison of North American and International Visitors

What will I get out of this?

Insight into differences among international and north american visitors to help improve communications about wildlife safety.

**Abstract** 

Viewing wildlife is one of the main reasons people visit national parks. However, in places like Yellowstone, the large, free-roaming wildlife does not only draw people to visit, but also presents a safety hazard. As visitation in Yellowstone is growing, it is also changing. In particular, international visitors appear to consist of a larger proportion of visitors. However, very little research has been conducted on international visitors preferences and experiences in the national parks of the U.S. This research uses simulated photographs to provide some preliminary perspectives about the differences in perceptions about safety around bison between international and North American visitors. Results are interpreted to help improve communications in Yellowstone about bison safety.

Keywords

humandimensions, social science, bison

Lead author / Session organizer

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10623

Do we need 'actual' park visitation for Park Rx? Studying nature-based virtual reality for stress-reduction

What will I get out of this?

Audience members will experience cutting-edge 360-degree nature video demonstrations and learn preliminary results on how these videos reduce stress compared to actual park visits.

**Abstract** 

Nature parks can promote human health and well-being. However, park access in unsafe neighborhoods or for people with physical limitations can be difficult or even impossible. Preliminary research suggests park visits in virtual reality (VR) can provide some health benefits for minimal cost to those who cannot otherwise access safe, nature parks. But this begs an important question: Which health benefits of parks can be reproduced in VR, and which cannot? We are starting to answer this question. Our pilot study tests stress-recovery after a mock job interview and mental arithmetic task in park settings experienced through a VR headset or by sitting outdoors in the park. Subsequent analyses will determine the extent to which people can quickly and efficiently recover from low-level, everyday stressors by visiting their favorite neighborhood (or far-away) park, from the convenience of their home or office.

Keywords

Park Rx, stress

Lead author / Session organizer

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10791 Compass Session

## Reaching Out on Scaling Up: Lessons from Landscape Scale Conservation

What will I get out of this?

This session will focus on the difficult realities of landscape-scale conservation. Participants will share lessons learned and yet-to-be learned about networked governance.

**Abstract** 

Climate change, habitat fragmentation and globalization require that conservation work at ever-larger scales. As we "scale up" to system-level planning and connectivity conservation, we must complement site-level management to accommodate and embrace a multiplicity of ownerships and interests across landscapes of diverse and competing land uses. But while the rationale for collaborating in this way is clear, the mechanisms are not. Institutional, economic and cultural barriers abound. This session will follow on the recent George Wright Forum theme issue on Scaling Up: Landscape-Scale Conservation. It will begin with short presentations but encourage audience sharing of experience. As part of this discussion, participants will explore issues in what is coming to be known as networked governance: shared decision-making over different types of protected areas and other conserved areas by a diverse network of organizations and individuals with interdependent interests in affected land and resources.

Keywords

landscape scale governance

Lead author / Session organizer

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National Parks and the Scaling Up Imperative

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Additional authors / organizers

Emily Bateson, Executive Director, Practitioners' Network for Large Landscape Conservation

Christina Marts, Assistant Superintendent, National Park Service

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Overview: Opportunities and Challenges for Scaling Up from a Networked Governance Perspect	ive

Chesapeake: A Network of Conservationists Across 64,000 Square Miles

TBD

11592 Update Session Privately Protected Areas: Issues, Opportunities, and International Examples

What will I get out of this?

An update from the IUCN World Commission on Protected Areas specialist group, and how to engage.

Abstract

Privately Protected Areas (PPAs) are under-represented in national protected area systems and under-reported internationally despite the fact that they are a rapidly growing element of the conservation estate. PPAs will be an essential component in achieving the Convention on Biological Diversity (CBD) Aichi Biodiversity Target 11 on completing ecologically representative PA networks around the world. This session will review recommendations and findings of the first global assessment, Futures of Privately Protected Areas, and outline plans to develop best practice guidelines for PPAs. We will describe responses to a new international mandate to support, promote and study PPAs; discuss issues in reporting governance to the World Database of Protected Areas; and provide several national case studies before opening up to discussion and updates from the audience.

Keywords

privately, private, governance

Lead author / Session organizer

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Additional authors / organizers

Overview of Privately Protected Areas Globally

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

Sharing U.S. Protected Areas with the World: PAD-US and the World Database for Protected Areas

**Brazilian Privately Protected Areas** 

Protected Area Governance in Belize

10855 Compass Session

#### **Advancing Nature-Culture Connections**

What will I get out of this?

Emerging initiatives recognize that natural and cultural heritage are bound together in many landscapes and seek to identify next steps to advance integration in conservation.

**Abstract** 

There is growing evidence that natural and cultural heritage are closely interconnected in many landscapes/seascapes and effective conservation of such places depends on better integration for planning and management. Natural and cultural heritage experts face similar conservation challenges in places with complex interrelated ecological and cultural networks and each brings a body of complementary knowledge and capacities. In response, ICOMOS and IUCN co-sponsored a Nature-Culture Journey at the September 2016 IUCN World Conservation Congress in Hawai'i, a series of over 50 related sessions that explored examples and produced a statement of commitments for advancing good practice. It was agreed that additional dialogue was critical to more fully explore and advance this approach to conservation. 10-minute panel presentations will reflect on this Journey and describe collaborative initiatives in key areas of conservation practice. Discussion will highlight examples of integrated conservation strategies and identify next steps to advance this work.

Keywords

nature-culture interlinkages, conservation

Lead author / Session organizer **Nora Mitchell** Adjunct Associate Professor

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Additional authors / organizers

Tim Badman and Andrew Potts

IUCN's perspective on the importance of interlinkages of nature and culture for conservation

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ICOMOS's perspective on the importance of interlinkages of nature and culture for conservation

Strengthening the Intersection of Conservation, Sustainability and Human Rights

Protected Landscape/Seascape perspective on the importance of interlinkages of nature and culture for conservation

NPS Perspective on the importance of interlinkages of nature and culture for conservation

Utility of using submerged aquatic vegetation as an indicator to focus monitoring and build partnerships

What will I get out of this?

Multiple partners have built a lake monitoring program to understand why aquatic grasses have disappeared from Lake Mattamuskeet, Mattamuskeet National Wildlife Refuge.

**Abstract** 

The purpose of Mattamuskeet National Wildlife Refuge is to protect and conserve migratory birds and other wildlife resources through the protection of wetlands. In 2012, USFWS, USGS, NC Wildlife Resources Commission and NC Division of Water Resources partnered to build a lake monitoring program for the purpose of improving understanding why submerged aquatic vegetation (SAV) was disappearing from the 40,000 acre Lake Mattamuskeet, the centerpiece of the 50,180 acre Refuge. Lake Mattamuskeet is a shallow lake that has recently experienced a reduction in water clarity and submerged aquatic vegetation, and an increase in nutrients, phytoplankton, harmful algal blooms, and cyanotoxin production. Moving forward, SAV will serve as our indicator species for lake health at Lake Mattamuskeet and monitoring, research, and management efforts will focus on the restoration of SAV at Lake Mattamuskeet.

Keywords

Partnerships, water quality

Lead author / Session organizer

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John Stanton, USFWS

Adam Smith, USFWS

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10770 Compass Session

## **Conserving Climate Change Refugia as a Climate Adaptation Strategy**

What will I get out of this?

We will showcase the latest science on climate change refugia and how NPS managers are focusing on them to improve resource management and conservation

**Abstract** 

The novelty, uncertainty, and complexity of climate science make it difficult to translate into action on-the-ground. Speakers will present a framework for identifying and conserving climate change refugia, areas buffered from climate change that enable persistence of physical, ecological, and cultural resources, as a potential climate adaptation option, with NPS examples of how they are being managed. Toni Lyn Morelli will chair, with an overview presentation of 15 minutes followed by a 5-minute Q&A session. That format of 15+5 minutes for Q&A will continue with four other speakers: Glacier NP Superintendent Jeff Mow, USGS Biologist Jennifer Cartwright, Devils Postpile NM Superintendent Deanne Dulen, and Alec Nelson (all confirmed, presentation titles above). For the final 20 minutes, Morelli, Mow, Dulen, John Gross, and Gregor Schuurman would act as panelists to dialogue with the audience. While the presentations are ongoing, questionnaires will record audience interests and questions they have for the panel.

Keywords

climate change adaptation

Lead author / Session organizer

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Additional authors / organizers

Managing Climate Change Refugia for Biodiversity Conservation

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

Climate change refugia for cold water fisheries

Remote sensing approaches to identify drought refugia

Confirmed

One Hundred Parks and Counting: Biodiversity Findings and Outreach Impacts from a Nationwide BioBlitz

What will I get out of this?

Audience members will learn about how citizen science is helping national parks, national monuments, and other NPS lands better understand their species diversity.

**Abstract** 

The National Park Service hosted a national BioBlitz, in partnership with National Geographic Society, to celebrate its 2016 Centennial. Participants entered species observations including photos into iNaturalist, making observations instantly viewable and organized into a single, georeferenced database. This provided an unprecedented nationwide look at the intersection of biodiversity and people. We examined what percent of known biodiversity was recorded, how these percentages varied across species groups and nearly 100 parks and monuments, and if any climate migrants were identified. We also looked at how public engagement contributed to science and conservation: how did visitor numbers on BioBlitz weekends compare to other weekends? How many people made observations via iNaturalist? Did numbers and diversity of species recorded depend on participant numbers or outreach effort or the weather? Our analyses enable development of park-specific, regional, and national hypotheses about biodiversity, and improvement of methods to engage and benefit diverse human communities.

Keywords

biodiversity, Centennial, citizen-science

Lead author / Session organizer

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Additional authors / organizers

Bogulima Backiel - University of Massachusetts

Jennifer Briggs - U.S. Geological Survey

Erin Boydston - U.S. Geological Survey

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A Preservation Paradox: Reconciling the Wilderness Act and Cultural Resource Protection Mandates in Wilderness Management

What will I get out of this?

Learn about new guidance from the NPS addressing cultural resources in wilderness that builds on interagency guidance and court decisions, with focus on wilderness character.

**Abstract** 

Wilderness managers are faced with particularly acute dilemmas when managing cultural resources in wilderness – how to manage cultural resources appropriately while following the Wilderness Act? This presentation considers implications of past court cases, and offers a thoughtful way forward, to build appropriate management practices. It focuses on a framework and guidance for considering cultural resources within a wilderness context, developed by the NPS Wilderness Leadership Council. The presenters also offer interpretations of the Secretary's standards for cultural resources located in wilderness. Consultation and interdisciplinary working groups have potential to create environments in which everyone has a stake in conserving important resources.

Keywords

wilderness, cultural resources,

Lead author / Session organizer

Karen Mudar Archeologist

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Additional authors / organizers

Laura Kirn is Chief of Resources at Channel Islands National Park. She has much experience managing cultural resources in Yosemite Wilderness and other wilderness areas in the National Park System.

Cultural Resource Conservation Practices: Assessing Trends in Prosecuting Archeological Site Destruction on Federal Lands

What will I get out of this?

This study presents rare data about archeological looting and vandalism. Analytic results assist in developing ways to better protect archeological resources on Federal lands.

**Abstract** 

One component of place-based conservation is resource protection. How do we build agency-wide conservation practices that protect cultural resources? Mudar and Burgin examine current Federal agency conservation practices for protection of archeological resources. Using data on all Federal prosecutions of violations of the Archaeological Resources Protection Act (ARPA) from 1986-2012, and a sample of agency-reported infractions, the authors demonstrate that ARPA prosecutions decline over time, but that the prosecution success rate increases. A significant number of looting incidents are handled informally by the land manager through other means, and through other types of prosecutions. Comparison with reported incidents of site damage demonstrates that looters and vandals are apprehended less than 1% of the time. Recommendations include a need for more accurate reporting in order to assess success of conservation practices.

Keywords

ARPA, looting, prosecutions

Lead author / Session organizer

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Additional authors / organizers

Leah Burgin, Brown University

#### **Citizen Science Acoustical Bat Monitoring**

What will I get out of this?

This project highlights the use of citizen science, cross divisional collaboration, and the use of technology to draw visitors into deeper understanding.

**Abstract** 

Acoustic monitoring of bats to determine baseline species diversity at elevation gradients (5000 – 8000 ft elev) along the Highway 120 corridor of Yosemite National Park. This project was a cross divisional effort: involving Yosemite's Resource Management and Science as the guidance and support, and interpretive rangers and wildlife interns working hand in hand with the public to conduct an educational program while beta testing Sonabat4 to collect data. This project proved to be an effective mode of inviting visitors into science in the park, interacting with a species that visitors don't normally see, and integrate new technology into a direct experience with the parks through audience centered interpretation and hands on science. The next step Summer 2017 "The Yosemite Bat Channel" – a live feed on the Yosemite website of the bat activity in Yosemite Valley. This will be supported by curriculum to engage students in inquiry based science.

Keywords

Bats, Citizen-science, interpretation

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Lead author / Session organizer **Lisa Murphy** Mather District Interpretive supervisor, Yosemite

Additional authors / organizers

A Good Beginning – Working With Indigenous Peoples for New National Parks in Northern Canada

What will I get out of this?

The presentation will share examples and experiences of fruitful cooperation between a park agency and Indigenous governments and organizations during the park establishment process.

**Abstract** 

In the past 25 years, Canada's national park system has grown in area by 85% through the creation of over a dozen new national parks. Most of the area added to the National Park system has come as a result of agreements negotiated with Indigenous communities and organizations. The relationships established during the work to create the new park are fundamental to the success of the project and ultimately to the successful cooperative management of the park in the future. The presentation provides examples of park establishment projects, with lessons learned and key results.

Keywords

negotiation, indigenous, collaboration

Lead author / Session organizer **David Murray** Senior Planner, New Northern Parks

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**10911**Day-Capper (UPD)

#### Kontiwennenhá:wi: Women Carrying Words

What will I get out of this?

You'll be introduced to social songs and dances of the Kanienkeha:ka (Mohawk) Nation, their role in the community, and how they support the Mohawk language.

**Abstract** 

Kontiwennenhá:wi, which translates to Women Carrying Words, is a women's singing group that originated from the Kanienkeha:ka (Mohawk) Nation in 1998. Kontiwennenhá:wi is comprised of young women, mothers, aunties and grandmothers who all work full time as teachers, social workers, students, and homemakers. The women of Kontiwennenhá:wi, have embraced the duty to help our language survive; this is why we have created songs that incorporate our language. We use song and dance to lift spirits and develop friendships. We will share what we call social song and dances. We will explain what the dance is and demonstrate the dance, but at the same time, we invite everyone to dance, if they'd like to. In between dances, and to give people an opportunity to rest, Bear Fox will share some songs that she created.

Keywords

Indigenous song, dance

Lead author / Session organizer

**Elizabeth Nanticoke** Elder and member of Mohawk Women's Singing Society

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Additional authors / organizers

Iawentas Nanticoke, Tekonwakwenni Nanticoke, Bear Fox, Maxine Cole, and Katsitsionni Fox


# Using motion-activated photography to evaluate physical activity in parks

What will I get out of this?

Attendees will learn how motion-activated cameras aid in tracking visitor activity type to connect parks and health.

**Abstract** 

Park professionals and researchers often identify visitor activity type (e.g., runners, bikers, walkers) to evaluate the physical health benefits of parks. However, identifying and monitoring visitor activity types at multiple locations within a park unit is time consuming, resource intensive, and subject to observer error. Therefore, managers and researchers have begun using motion-activated cameras to document visitor activity to assess the health benefits of parks. Past studies have suggested time-lapsed and motion-activated cameras to be affordable, efficient, and provide digitally formatted data that clearly differentiates between activity types. The motion-activated camera method helps provide managers with valuable information for National Park Service (NPS) initiatives, such as Healthy Parks, Healthy People, to document the connections between parks and health. This poster will outline the motion-activated camera method, its past applications in parks and protected areas, rationale for use, and recommendations for use in diverse environments, including NPS units.

Keywords

camera, health, parks

Lead author / Session organizer

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Additional authors / organizers

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Perceived Health Benefits Associated with Engagement with Klondike Gold Rush National Historical Park

What will I get out of this?

Parks are more than the location where physical activity takes place; we must advance our understanding of the many ways park engagement influences health.

**Abstract** 

Goal three of the National Park Service's 2011 call to action is: EXPAND the use of parks as places for healthy outdoor recreation that contributes to people's physical, mental, and social well-being. While seemingly a comprehensive view of health, this definition places health within discrete domains. This leads to simplistic conceptions of how people experience health in parks, often with the emphasis of physical health and casual mention of mental health. The goal of this case study of Klondike Gold Rush National Historical Park is to explore how diverse visitor populations (cruise ship passengers, multi-day backpackers and independent visitors) conceive of their own health through park engagement as well as how park employees perceive how visitors experience health. How we view nature colors how we see people in nature, which then affects what is healthy in nature. Through this exploration, I hope to expand the definition of health in parks.

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Health, Engagement, Social

Lead author / Session organizer Sara Newman Doctoral Student

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Additional authors / organizers

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# The Application of Drones to Applied Science and Management in U.S. National Parks

What will I get out of this?

The audience will learn how drones can be applied responsibly and realize the enormous benefits of drones, including decreased data collection costs and reduced risk.

**Abstract** 

The irresponsible operation of drones by hobbyists initiated severe limitations on their use in U.S. National Parks. Following thorough review by federal officials, commercial drones are slowly being re-introduced (under specific permits) for science and support services in national parks. We describe the current state of small unmanned aircraft systems and their application to habitat health assessments, coastal erosion surveys, water quality measurements, endangered species monitoring, invasive species tracking, marine debris identification, and infrastructure inspection. We focus on three specific case studies from the Cape Lookout National Seashore: monitoring submerged aquatic vegetation, assessing at-sea distributions of sea turtles, and inspection of the iconic lighthouse. We also highlight safe operations and legal requirements for drone use, and illustrate how they can decrease costs and reduce human risk. This information will motivate the audience to develop further applications of drones to support conservation efforts in our National Parks and other protected areas.

Keywords

drones, robotics, sensors

Lead author / Session organizer

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Additional authors / organizers

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Ms Jeri DeYoung, Chief of Resources Management, Cape Lookout National Seashore

Mr Pat Kenney, Superintendent, Cape Lookout National Seashore

Dr David Johnston, Director, Duke Marine Robotics and Remote Sensing Facility

# Spatial Temporal Dynamics of Visitor Stopping Behavior Along a Rustic Park Road

What will I get out of this?

Audience will learn how ArcGIS's "space time cube", when applied to visitor behavior data, can improve understanding, planning, and adaptive management of park transportation systems.

**Abstract** 

Visitor use of parks and protected areas is dynamic. The flow of visitors changes from hour to hour, day to day, and season to season. Previous studies have used geospatial models to better understand visitor flow. Geospatial data give a more accurate and precise insight to visitor movements, however few studies utilize integrated spatial and temporal data. This presentation focuses on the application of the ArcGIS toolbox, which combines space and time into one analysis to identify space-time hot and cold spots, representing various levels of use through time in the Moose Wilson Corridor (MWC) of Grand Teton National Park. Based on "vehicle stop" data within the MWC, spatial-temporal hot and cold spots were classified and then described by paired demographic data. Such information is valuable to park managers to better understand and adaptively manage visitor flow and the impact on the quality of the visitor experience.

Keywords

visitor use, GPS

Lead author / Session organizer

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B. Derrick Taff, Pennsylvania State University

Ashley D'Antonio, Oregon State University

Christopher Monz, Utah State University

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Utilizing GIS and Citizen Science for Climate Change Adaptation at North Cascades National Park Complex

What will I get out of this?

Audience members will learn about new cloud-based GIS technologies that enable land managers to integrate research with public engagement through citizen science.

**Abstract** 

Climate models predict substantial increases in annual temperature in the Pacific Northwest, projecting a warming of about 2°C by the 2040s and over 3°C by the 2080s. Culverts are generally designed to withstand current climatic conditions, but stream flow changes resulting from climate change will heighten the risk of culvert failure. Culvert failure deteriorates water quality, impacts stream function, acts as a barrier to aquatic organism passage, and threatens transportation infrastructure used by park staff and visitors. The existing infrastructure database utilized by North Cascades National Park is not spatially referenced, preventing employees and researchers from using GIS to perform critical analyses on culverts. Hydrologic models have projected future peak flows by location, which, coupled with geospatial culvert data, would allow park staff to pinpoint undersized or at-risk culverts. Using volunteers and cloud-based Esri mobile tools, park staff at NOCA now have the capacity to collect georeferenced information on infrastructure.

Keywords

GIS, Citizen Science

Lead author / Session organizer

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Regina Rochefort, National Park Service

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## **Building a NPS Workforce of Young Leaders in the Second Century**

What will I get out of this?

Facilitators will challenge participants to question assumptions about diversity and develop creative ideas to recruit, mentor, and hire young scientists into the NPS workforce.

**Abstract** 

Three national programs use novel internship models to integrate diversity and science-based decision making into the workforce of the National Park Service. As we enter a second century of new challenges, seasoned employees seek creative ways to cultivate the next generation of NPS leaders and benefit from the creativity and innovation of talented young scientists. Facilitators invite employees, young scientists, and others to share ideas on ways to retain institutional knowledge, build the leadership capabilities of the next generation, and opportunities for direct hire. Participants will explore best practices to integrate science into decision-making, and the benefits of and effective methods to recruit and retain diverse young scientists. Participants will depart with tangible plans to transfer institutional knowledge through mentorship, access the next generation of scientists through the Direct Hire Authority, increase the diversity of the NPS workforce, and integrate science into decision-making to prepare national parks for the future.

Keywords

Youth, Diversity, Workforce

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## Online Visualization Tools for Bird, Water, and Forest Data in Capital Region Parks

What will I get out of this?

Learn how to use interactive online maps and graph tools showing data on vegetation, water quality, and birds in National Capital Region parks.

**Abstract** 

A new type of online tool allows users to dig deep into data on park natural resources like water quality, forest trees and plants, and birds. At first glance, the National Capital Region Inventory & Monitoring Network's (NCRN I&M) forest vegetation visualizer might just look like a map. But zoom in closer and you will see the locations of their 400+ monitoring sites across Maryland, DC, Virginia, and West Virginia. Individual plots reveal the list of the species found there, ranging from trees and shrubs, to vines and herbs. A search for a particular species will cause the plots containing it to light up. Or if you're more interested in park-wide trends or trends over time, those are available in graph format. These visualizers make it easier to answer questions on the fly and with the most up-to-date information, in a way that published reports can't.

Keywords

forest, water, birds

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#### **Adapting Storage Solutions in a Changing Climate**

What will I get out of this?

The audience will learn about innovative storage solutions to maximize storage capacity and better care for the collections we manage.

**Abstract** 

In an ever changing world, we must continually adapt and develop new strategies to ensure the best care and management for the collections we are tasked to protect and preserve. By reflecting on the past mismanagement of collection storage spaces throughout the country, we are better able to develop innovative storage designs. With the aid of advanced storage systems, designed with flexibility and growth of collections in mind, we as stewards of the past can plan for unknown additions and developments to collections in the years to come. This allows for the ability to progress towards centralized storage collection centers, such as the Museum Resource Center, the curatorial storage facility for the National Capital Region of the National Park Service. By utilizing such a facility, collections can be stored in a facility with proper environmental controls and physical security systems, safeguarding an ever-increasing number of collections.

Keywords

Storage, innovative, growth

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Social media as a communication tool for promoting conservation and park visitation in the NPS.

What will I get out of this?

This poster will shed light on the discussions of users of parks and public spaces, the conversation on conservation and park visitations.

**Abstract** 

Social media has emerged as a viable mode of communication and promotion of tourism, and is increasingly being used by agencies managing parks and protected areas to promote their destinations. A growing number of Destination Management Organizations are also using various forms of social media platforms to effectively promote their products and services, and to directly engage with the end users about their experiences. Social media also provides an interface for which users and visitors interface with the park management agencies in real time and can provide feedback on their experiences. This paper will examine the impact of the National Park Service centennial social media promotions on users, and in particular look at the Facebook and Twitter presence and use.

Keywords

Social media, parks

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Investigating the early snowmelt of 2015 in the Cascade Mountains using new snowmelt timing maps

What will I get out of this?

Using MODIS imagery, we create snowmelt timing maps for North America, and identify spatial patterns of snowmelt anomalies for ROMO, CRLA, and LAVO NPs.

**Abstract** 

The spring of 2015 brought an alarmingly early snowmelt to the Cascade Mountains, impacting flora, fauna, watersheds, and wildfires. It is important that we understand these events because model-based projections suggest that snowmelt may arrive an average of 10-40 days earlier across the continental US by the year 2100. Available snow measurement methods including SNOTEL stations and stream gauges offer insights into point locations and individual watersheds, but lack the detail needed to assess snowmelt anomalies across the landscape. In this study we describe our new MODIS-based snowmelt timing maps (STMs), validate them with SNOTEL measurements, then use them to explore the spatial patterns of the 2015 snowmelt in the Cascades. We found that the Cascade Mountains experienced snowmelt 41 days earlier than the 2001-2015 average, with many areas melting >70 days early. Of concern to land managers, these events may be the 'new normal' in the decades to come.

Keywords

GIS, watershed, climate

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## Keep Your Chinn Up: Lessons Learned in Managing for Change During WWII

What will I get out of this?

The fall of Chinn House from 1936-1950 serves as a case study of success and failure in managing change toward "the heritage of the future."

**Abstract** 

Hazel Plain, later known as the Chinn House, was likely built around 1769 on land that is now part of Manassas National Battlefield Park. It was an example of the Georgian architectural style for plantation houses and served as a field hospital during the battles of First and Second Manassas. The U.S. Government acquired the property in 1936, when the house was 176 years old. The National Park Service planned to restore it, but World War II got in the way. By 1950, NPS razed the house down to the foundation because it had become such a safety hazard. It is now unusual among ruins because recent cultural landscape inventory compiled photographic documentation of its fall from a standing structure to foundations. This case study of devolution is an example of how resource management through triage and documentation in a time of major change affects "the heritage of the future."

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Chinn, House, Preservation

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Find your park online: An analysis of social media and the National Park Service Centennial

What will I get out of this?

Attendees will learn about the public conversation around social media campaigns related to national parks, including various details of users and online behavior.

**Abstract** 

Social media is a key communication method for agencies and organizations to distribute information to the general public. This communication, and the resulting conversation, has been a part of the National Park Service (NPS) Centennial through the use of specific tags used across various social media platforms. This paper will look at social media use surrounding the NPS Centennial through the specific hashtags #FindYourPark and #NPS100. We will present an analysis of how these tags, promoted by the NPS and its partners, are used and what insights can be gleaned from conversations related to them. Particular aspects will be examined such as sentiment, frequency, and location of social media posts. Radian6, a social media tracking software, and R, a software environment for statistical computing and graphics will be used to analyze the content that was shared online by users.

Keywords

social media, engagement

Lead author / Session organizer

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**Evaluating Employee Perceptions of Vulnerability and Resilience to Extreme Weather Events** 

What will I get out of this?

My audience will learn new approach to evaluating perceptions of vulnerability and resilience to extreme weather events in parks and other protected areas.

**Abstract** 

This study describes employee perceptions of vulnerability and resilience in Missouri State Parks & Historic Sites due to extreme weather events that occur across the state, but grouped according to physiographic provinces. Using a 4-point rating scale, perceptions of vulnerability and resilience were divided into high and low sub-groups, thus allowing researchers to construct a 2X2 typology of employee responses. Subsequently, this data was used to develop a 3-point continuum (1=high vulnerability / low resilience to 3=low vulnerability / high resilience) of environmental concern (higher scores meant more concern). Employee scores were then compared against a statewide assessment which combined social, economic, infrastructural and environmental indicators of vulnerability and resilience. State park employees thought the system was less vulnerable and more resilient to climate change than data found in statewide assessment (2.02 vs. 1.85). This result was also consistent in three out of five physiographic regions across Missouri.

Keywords

Parks, Vulnerability, Resilience

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10716

# **Evaluating Conservation Corps Habitat Projects: Forest Fuels and Invasive Species Management**

What will I get out of this?

We share newly created standardized assessment protocols for evaluating conservation corps' efforts in promoting natural habitats through forest fuels reduction and invasive species management activities.

**Abstract** 

Large-scale evaluation of environmental work completed by conservation corps on public lands across the U.S. is challenging due to the diversity of project and habitat types, as well as measurement tools. The purpose of this study is to create standardized protocols to collect data on habitat improvement projects on public lands. In collaboration with 14 corps working in 11 states, protocols were developed for two habitat project objectives common across the corps: invasive species removal and forest fuels reduction. Standardized measures assist corps in evaluating their work and communicating their efforts to state and federal land agencies, supporting funding proposals and additional opportunities. Conference attendees will come away with an understanding of the sampling, instruments and indicators being tested by the corps and how the protocols could be applied to additional work by other organizations.

Keywords

Habitats, Conservation, Corps

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10863

Experiences from the field: Linking community and conservation through ecotourism in Nepalese National Park

What will I get out of this?

Audience members can apply the lessons learned from this project to promote inclusive ecotourism planning and development in their own contexts.

**Abstract** 

Bardia National Park (BNP) of Nepal is an emerging ecotourism destination with global significance in part due to its role in conserving endangered wildlife such as Bengal Tigers. However, there have been very limited efforts to promote ecotourism in the area despite its cultural attractions and rich biodiversity. This poster will include our experiences of working with the park managers, tourism entrepreneurs and local communities to promote local participation in tourism in Bardia National Park. Using holistic approach of stakeholder collaboration, community capacity building, and research, the project has strengthened community based conservation institutions to take lead on ecotourism planning and development process within their communities. This project has laid foundation for locally driven, planned and inclusive ecotourism development in the park.

Keywords

ecotourism, community, Nepal

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Dr. Brijesh Thapa is a professor in the Department of Tourism, Recreation and Sport management at University of Florida with more than 15 years of experience on building capacity for ecotourism development in developing countries especially in and around protected areas. Over the years, he has been extensively engaged in numerous projects in various capacities(e.g. research, training, university partnership, graduate student research mentorship, etc.) in 32 countries including Nepal.

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## Impacts of community based ecotourism on Tharu indigenous community in Nepal

What will I get out of this?

Audience members will have better understanding of possible impacts of community based ecotourism on indigenous communities

Abstract

Community based ecotourism (CBE) is increasingly promoted in and around protected areas as a way to directly provide conservation benefits to communities who are adversely affected by protected area establishment. However, there is need of additional cases that illustrates what the theoretical promise of CBE has to offer to the indigenous communities. In this paper, we present the case of Khata bio-corridor homestay (KBH) located in buffer zone area of Bardia National Park as a successful indigenous community led CBE project in Nepal. Using data from participant observation, interviews, community workshop and household surveys, we analyzed the impacts of KBH on various domains of wellbeing and empowerment of indigenous Tharu people involved in KBH. Findings suggest that CBE has enhanced quality of life of Tharu people mainly by increasing family income, diversifying household economy, empowering women, strengthening community pride and belongingness, increased connectedness to outsiders, recognition and preservation of culture.

Keywords

ecotourism community Nepal

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# Climate Change Marine Vulnerability Assessment of Cumberland Island National Seashore

What will I get out of this?

Learn about a methodology for assessing and calculating the climate change vulnerability of marine habitats within a geographic area.

**Abstract** 

The goal of this project was to develop a framework for assessing the vulnerability of marine habitats within the NPS, beginning with a pilot project at Cumberland Island National Seashore (CUIS). This framework employs a vulnerability assessment approach in which vulnerability is the sum of exposure (the magnitude of the stressor), sensitivity (how strongly a system is affected by the stressor), and adaptive capacity (the potential to adjust in response to the stressor). Four climate-change-related stressors were analyzed: SLR, temperature change, salinity change, and ocean acidification. The marine habitats of interest include subtidal and intertidal environments at CUIS. For each habitat-stressor combination, the exposure, sensitivity, and adaptive capacity were rated on a qualitative scale of low-medium-high. Results show the most vulnerable marine habitat at CUIS to be high-fringing salt marsh, a narrow and sporadic zone between the expansive low salt marsh and the uplands.

Keywords

climate, marine, vulnerability

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#### Factors Affecting Public Awareness of and Visitation to National Parks

What will I get out of this?

Findings of study advance theories of underrepresentation of racial/ethnic groups in outdoor recreation areas, and provide empirical suggestions for NPS to engage with diverse audiences.

**Abstract** 

National parks represent America's democratic idea and attract more than 300 million visits annually. However, racial/ethnic minority groups are underrepresented in the visitation numbers and tend to have lower awareness about national parks than Whites. To investigate what may influence awareness level and visitation patterns to national parks, study conducted a general population survey of New York City. The multivariate relationships among social-economic characteristics, childhood visit history, awareness of national parks, and visitation rate by racial/ethnic groups were analyzed using Path Analysis. Study findings suggest that Hispanics and Blacks tend to have lower levels of awareness about national parks than Whites. Awareness levels and childhood visit history significantly impact visitation to national parks. Study findings partially support marginality and subculture hypotheses, illustrate the differences in awareness levels and visitation patterns by racial/ethnic groups, and suggest potential approaches to encouraging diverse racial/ethnic groups to learn about and engage with national parks.

Keywords

Awareness, Race/Ethnicity, Visitation

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Urban Opportunity: A Multi-method Evaluation of the National Park Service Urban Agenda's Multi-dimensional Resilience

What will I get out of this?

This presentation will demonstrate ways of effectively combining multiple data types, investigating large issues in complex settings, and harnessing collaborative opportunity present in urban areas.

**Abstract** 

The National Park Service (NPS) has recognized and acted upon the need to connect its parks and programs to urban communities with its centennial Urban Agenda. Understanding current NPS-community relationships is vital to implementing relevant efforts and having a baseline for comparison. Such an understanding requires investigating conditions both deeply and broadly, especially when considering long-term contributions and resilience. We undertook a program of multi- method research in three (Boston, Tucson, and Detroit) of the 10 NPS pilot Model Areas to assess this depth and breadth of conditions: in-depth qualitative interviews with 21 NPS staff and community partners per site (63 total) and quantitative social network analysis (39 in Boston, 80 in Tucson, and 79 in Detroit). Both methods, separately and together, yielded information pertinent to urban park managers and resilience theory on the role of collaborations in facilitating robust and relevant park connections with local urban audiences.

Keywords

collaboration, urban, relevancy

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10829

# Creative Edges and Innovative Brokers: Social Network Structure, Resilience, and the National Park Service

What will I get out of this?

This poster will relate the value-added opportunities that partnership networks harbor. Viewers will learn about structures that may increase institution, location, and systems resilience.

**Abstract** 

The Urban Agenda of the National Park Service (NPS) provides opportunity for critically examining partnerships to promote connections to proximate populations. Although one-on-one partnerships are often probed, the critical broader scale of overall NPS relevance and cityscape resilience in networked partnerships is less examined. Examining different relationship networks may help identify structures that promote the building and maintenance of partnerships for NPS (and other institutions') relevancy. To this end, we conducted an ego-centric social network analysis in three cities with differential NPS physical presence: Boston (urban-embedded parks), Tucson (urban-adjacent park), and Detroit (programmatic-only). Relationship networks identified by NPS staff tasked with being urban conveners (N = 39/Boston, 80/Tucson, and 79/Detroit) were surveyed as to the strength and directionality of relationships, as well as the potential for new future relationships. This research yielded findings of interest to managers working in concert with other organizations and to theories of collaboration and resilience.

Keywords

quantitative, urban, collaboration

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Robert Manning - University of Vermont

10724 Compass Session

Looking ahead: The future of visual resource management in the NPS

What will I get out of this?

Scenery is central to experiencing parks and protected places. This session will consider how the NPS manages scenery now and in the future.

**Abstract** 

Scenic views inspire future generations, are windows to the natural world, and foster connections with history and culture. As landscapes change with increasing speed, agencies need to actively engage in management of views within and beyond boundaries. The value of scenic views can be measured in terms of aesthetic beauty, economics, health benefits, psychology, and educational potential. Views can also be inventoried and weighed against other resource considerations. Understanding our role in preserving and protecting visual resources will be critical to the continued viability of protected areas as places of refuge and learning into the future. Join panelists in this session for a series of brief presentations on the value of scenic views, the evolving NPS approach to managing them, and case studies; followed by an open discussion.

Keywords

Scenery, Management, Visual-resource

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Cartographer, Appalachian Mountain Club

Air & Water Quality Program Manager, Shenandoah National Park

Superintendent, Potomac Heritage National Scenic Trail

10735 Update Session

#### Science and the BIG Picture for National Park Resources

What will I get out of this?

Ever wonder how the natural resource conditions in your area fit into the bigger picture? Come learn what NPS knows about resources across the US.

**Abstract** 

As resource professionals we spend a lot of time studying the minute details of research questions. This session will provide an opportunity for stepping back and looking at what science in parks is telling us about our natural resources at a national level. We will also hear from subject matter experts about major trends and our evolving approach to understanding resources. Resources covered will include air quality and scenic views, geology, climate change, natural sounds and night skies, and invasive plants.

Keywords

Resource, Condition, Science,

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Clean Air and Clear Views... Are we there yet?

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Animals and Plants: How Are They Doing in National Parks?

Climate Change and Our National Parks

Natural Soundscapes and Lightscapes in National Parks

Put it on a map! With inventory data scenic views are more than pretty pictures

What will I get out of this?

Come see the power of mapping for gaining new insights about scenic views.

**Abstract** 

Maps have the power to help us visualize and communicate the value of scenic views in a new way. The NPS visual resources inventory allows parks to document and spatially define what they care about and why. Data include the location of the view on the landscape and its visual extent combined with ratings for scenic quality and view importance. Spatial analysis can quickly show where views overlap, which portions of the landscape are truly visible from a given view point, and what the composite value of all intersecting views is. This information allows managers to integrate visual resource considerations into park planning and management. This is especially important when working with partners beyond our boundaries to affect project proposals and target critical areas for visual resource protection. Join me to learn more about the NPS visual resource tools and see some examples of in-park application.

Keywords

Views, Mapping, Scenery

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10651

GPS Visitor Tracking to identify ideal locations for park staff-visitor interactions at Cumberland Island

What will I get out of this?

This presentation will outline the management issues, methods, and describe how GVT can help identify the locations and times for efficient park staff-visitor interactions.

**Abstract** 

Park volunteers, rangers, and staff are often placed along key visitor travel routes and destinations. However, determining the locations and personnel resources to effectively intercept visitors is complex and often varies by season. GPS Visitor Tracking (GVT), which consists of distributing small GPS units to visitors, helps identify visitors' temporal and spatial travel patterns and the variation of those patterns across seasons. Consequently, GVT can help identify key locations and resources needed for ideal park staff-visitor interactions across and within seasons. This study gathered seasonal GPS tracks of day-use visitors at Cumberland Island National Seashore (CUIS) and analyzed the tracks using GIS. Resulting data illuminated visitor travel routes, and the ideal locations for park staff-visitor interactions at the seashore. The presenters will display a series of maps and emphasize the management implications at CUIS and beyond

Keywords

**GPS Visitor Tracking** 

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Dr. Matt Brownlee is an Assistant Professor of Natural Resources Recreation Planning and Management at the University of Utah. His inter-disciplinary research links outdoor recreation and resource management, and provides information to help park and protected area managers plan for, monitor, and evaluate visitor experiences. Dr. Brownlee also examines how nature-based recreation into interest the provides are a supported by the provides and important to dispute a provide and important to dispute a pr

recreationists' interactions and attachments to climate-sensitive and impacted environments influence their a) attitudes towards sustainability initiatives, b) visitation and recreation behavior, and c) opinions about global climate change. His research generally incorporates student learning and addresses a pertinent management need in addition to unanswered academic questions.

Dr. Ryan Sharp is an Assitiant Professor in the Park Management and Conservation program at Kansas State University where he teaches and conducts research related to visitor use management in parks and protected areas.

#### A Genetically-Mediated Trophic Cascade

What will I get out of this?

Audience members will receive a timely update on the longest-running study of predator-prey dynamics every conducted, with implications for understanding the importance of apex carnivores.

**Abstract** 

A single wolf arriving in Isle Royale National Park in 1997 reinvigorated a genetically moribund population, leading to resurgence in wolf density and predation rate by 2004. Moose and beaver declined to historic low densities in 2004-2010, resulting in a terrestrial & aquatic trophic cascade. Growth resumed in balsam fir <1m tall that had been stunted by moose herbivory for many decades and in watershield, a native aquatic plant. A wolf decline after 2012 caused by renewed severe inbreeding (from lack of ice connections to the mainland in winter) is associated with reversal in plant recovery.

Keywords

wolf, moose, predation

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Letting the Landscape Speak: Values and Challenges of "Primitive Area" Design at Fort Bowie NHS

What will I get out of this?

Examine history of park landscape design. Explore successes and challenges of primitive area protection.

**Abstract** 

At the height of the Mission 66 development frenzy, Fort Bowie National Historic Site was established to preserve the ruins of one of the most important military centers active during the Indian Wars. Anticipating 400,000 visitors yearly, Fort Bowie's first design plan envisioned full site development and a cable car to transport visitors to the ruins. Others saw a historic environment unaltered by human intrusion. By preserving Apache Pass in a primitive state, the visitor would instead experience a landscape of Historic Abandonment. Still without an entrance road, today's visitor must hike this foreboding landscape marked by past tragedies and redolent of ghosts to reach the Fort ruins. Though visitation numbers are small, hikers almost uniformly praise this park experience as one of the best. However this primitive area designation has engendered challenges -- ecological, administrative, and financial -- that were unforeseen at Fort Bowie's inception.

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Additional

primitive area, design

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Measuring color and brightness of artificial sky glow from cities using an all-sky imaging system

What will I get out of this?

This poster will display information about the impacts of LED lighting in cities across America and how this impacts night sky quality in National Parks.

**Abstract** 

Artificial light at night, when observed at some distance from a city, results in a dome of sky glow, brightest at the horizon. The spectral power distribution of electric light utilized will determine its color of the light dome and the amount of light will determine its brightness. Recent outdoor lighting technologies have included blue-rich light emitting diode (LED) sources that may increase the relative amount of blue to green light in sky glow compared to typical high pressure sodium (HPS) sources with warmer spectra. Measuring and monitoring this effect is important to the preservation of night sky, we present a method using a wide field CCD camera which images the entire sky in both Johnson V and B photometric bands to evaluate the impacts to night sky and night vision of this new lighting technology.

Keywords

Night Skies, Photometry

Lead author / Session organizer

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Shifts in Messaging at Coupled Human-Natural Systems to Achieve Reduced Impacts to the Acoustic Resource.

What will I get out of this?

Monitoring soundscapes is an important way to quantify wildlife and visitor use. Educating the public about natural quiet can make positive changes to acoustic resources.

**Abstract** 

Muir Woods National Monument, right outside of the San Francisco metro area, had over a million visitors last year. The park encompasses 554 acres, including magnificent old-growth Coastal Redwoods. Managing large numbers of visitors in a geographically small park takes creative planning. The monument has worked with the Natural Sounds and Night Skies Division and Universities to test different treatments evaluating how the natural soundscape could be improved for the visitor experience. After previous research, there was a management decision to place signs ahead of the Redwood groves asking visitors to "enter quietly." For the current project, we proceeded with two different treatments, additional "quiet" signs throughout the park and removal of all "quiet" signs in the park. Trail counters collected visitor data, along with sound pressure level meters and acoustic recording units. A wildlife study was conducted simultaneously to determine how levels of activity changed with different treatments.

Keywords

Soundscapes, Visitor Experience

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Invasive Eucalyptus Removal and Hydrologic Implications on Santa Cruz Island, Channel Islands National Park

What will I get out of this?

Audience will learn about invasive eucalyptus removal on 30 acres and the indirect effect of tree removal on groundwater elevations.

**Abstract** 

hannel Islands NP embarked on restoration of the largest wetland on all the Channel Islands and associated riparian corridor by removing 10,000 yards of fill, planting 12,000 native plants, and removing 30 acres of invasive eucalyptus trees in cooperation with partner, The Nature Conservancy. During the feasibility and early implementation phase observation wells were installed in four locations in the wetland area and five locations in the riparian corridor, including three wells in eucalyptus groves, one in native willows, and one in native oaks. Transducers were installed in wetland wells in 2011 and in riparian wells in 2012 which record groundwater elevation every 30 minutes. In 2011 a drought of record began and continued until 2017. Eucalyptus removal on 30 acres began in 2013. Data from observation wells and the effects of extreme drought and eucalyptus removal will be presented along with results from restoration efforts in the project area.

Keywords

groundwater, eucalyptus, restoration

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10831 Update Session

#### **Update on U.S. World Heritage Program**

What will I get out of this?

Will be of particular value to managers of U.S. World Heritage sites, those on the Tentative List, and those interested in becoming World Heritage sites.

**Abstract** 

During 2016 - 2017, the U.S. World Heritage program has been very active. A newly revised U.S. World Heritage Tentative List was announced in early 2017 and one or more nominations to the World Heritage List are being considered. In addition, the NPS is working to develop draft guidance to Department of the Interior agencies regarding how to consider World Heritage values in planning activities, with the ultimate goal to make such guidance government-wide. Input from managers of World Heritage sites in the U.S. on this guidance will be sought at this session. We will also provide updates on other aspects of the World Heritage program, including the World Heritage Fellowship, dues to UNESCO, and other hot topics.

Keywords

World Heritage, international,

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Chief, Office of International Affairs, Status & Future Plans for U.S. World Heritage Program		
International Cooperation Specialist, Co - Presenter on Above topic		

10402 Update Session Return of the Buffalo: A discussion of the impacts of federal buffalo on receiving Tribes

What will I get out of this?

Current issues concerning regulations that limit the ability of buffalo to get to Tribes and the transfer of live buffalo from Yellowstone NP.

**Abstract** 

The session will provide an update on current Tribal usage of buffalo acquired from federal facilities and show the positive impacts on Tribal life. ITBC has been assisting Tribes in acquiring buffalo considered "surplus" by federal parks and refuges since 1992. During that time Tribes have incorporated the buffalo into various aspects of their life and this session will show the impacts. Tribes have utilized the buffalo for cultural purposes, for addressing health issues and economic development. Current issues concerning regulations that limit the ability of buffalo to get to Tribes as well as the transfer of live buffalo from Yellowstone National Park will also be discussed. The role Tribes play in federal buffalo management and "conservation" of the species as well as the future of tribal buffalo management and the inclusion of federal "surplus" buffalo will also be discussed.

Keywords

bison, national mammal

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ITBC Executive Director

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ITBC President, Blackfeet Nation

ITBC Region 4 Director, Taos Pueblo

ITBC Vice President, Standing Rock Sioux Tribe

ITBC Tribal Representative for Fort Peck Assiniboine & Sioux Tribes

10759 Challenge Session

# International Protected Area Management Priorities and Perspectives - Identifying Common Challenges and Leveraging Shared Solutions

What will I get out of this?

Protected areas around the globe face common challenges and constraints. Identifying shared solutions can leverage expertise, improve administrative efficiency, better protect resources, and sustain benefits.

**Abstract** 

Multiple models of natural and cultural resource protection have been developed around the globe, at a range of scales, and to realize diverse objectives. While the differences among protection models and mechanisms reflect respective administrative, physical, and social environments, many areas experience common management challenges and constraints. Solutions to these challenges can be shared across political boundaries and among protected areas with similar priorities and circumstances. Sharing management solution can leverage scientific expertise and organizational investment to greatest effect. This session outlines priorities for and perspectives on protected area management around the globe, including World Heritage Sites, Biosphere Reserves, the NPS Scaling Up Initiative, and other approaches. Through a panel of diverse speakers, we look for points of intersection and divergence among management challenges and priorities, and consider when, where, and how management solutions can best be shared among diverse protected areas.

Keywords

**International Protected Areas** 

Lead author / Session organizer

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# Counting visitors – alternative approaches for estimating public lands visitation

What will I get out of this?

Managers must know how many people visit their lands. Many current counting approaches are inaccurate or out-of-date. Alternative approaches may yield better, cheaper estimates.

**Abstract** 

The number of visitors using public lands and waters is basic and necessary information for planning and management. Accurate and up-to-date visitor use statistics are important for administrative planning and resource allocation, visitor use and resource management, and public relations. While counting visitors may seem simple, developing accurate estimates of visitor use can be difficult in complex, porous, extensive, and/or dispersed visitor use areas. Further, many existing visitation estimation systems overcount some visitors and under-count others, with few mechanisms to correct these errors or validate results. This poster presents alternative approaches that can improve the accuracy and efficiency of estimating visitor use. Case studies describing approaches for a diverse range of public lands and waters include Western Arctic National Parklands, Hot Springs National Park, and the Chattahoochee River National Recreation Area.

Keywords

Visitor use estimation

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Pam Ziesler, Dave Pettebone, and Bret Meldrum; National Park Service, Social Science Program

Application of the Spatial Marsh Equilibrium Model to parks in Northeast Coastal and Barrier Network

What will I get out of this?

High-resolution spatial modeling of sea level rise using site specific input data produces more accurate and higher quality tools to guide management decisions.

**Abstract** 

While the amounts and rates of sea level rise predicted during the next century are contested, the inevitability of sea level rise is real, and 92% of coastal national parks are or will be affected by sea level rise. The purpose of this project is to model saltmarsh resiliency and migration in four national parks - Cape Cod, Fire Island, Gateway, and Assateague. The Spatial Marsh Equilibrium Model (MEM) utilizes site-specific inputs derived from analysis of field data (biomass, total suspended solids, water levels, and sediment organic content among others) to forecast future relative marsh surface elevation based on observed and predicted sea level trends. Digital elevation maps and maps of future intertidal plant community distributions provide the National Park Service with information needed to guide management and mitigation decisions to reduce the negative impacts of sea level rise.

Keywords

saltmarsh, sealevel, spatial

Lead author / Session organizer

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11348 Update Session

# IUCN WCPA members' meeting on Promise of Sydney initiatives and follow up actions

What will I get out of this?

This will inform IUCN WCPA members of current initiatives and strive to recruit WCPA members to join those initiatives.

**Abstract** 

This Update Session will review the recent initiatives of the IUCN World Commission on Protected Areas and how members can participate. The progress made on the recommendations from the the "Promise of Sydney" summary action plan developed at the 2014 World Parks Congress will be briefly described. In addition, the key recommendations and new initiatives produced at the 2016 World Conservation Congress in Hawaii will be reviewed. There will be time for questions and discussions, as well as issues members may wish to bring forth. This session will bring WCPA members up to date on the latest initiatives. Non-WCPA members, especially those with an interest in joining the global protected area network, are also urged to attend.

Keywords

IUCN, WCPA, global

Lead author / Session organizer **David Reynolds** GWS Board Member

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11372

Long-term trends of seabeach amaranth, a globally rare beach plant at Fire Island National Seashore

What will I get out of this?

Audience members will learn about combined methods for surveying rare plants, and how managers use this data in recovery efforts at one site in particular.

**Abstract** 

Seabeach amaranth (Amaranthus pumilus) is a rare annual member of the Amaranthacae and is endemic to Atlantic Coast beaches and barrier islands from South Carolina to Long Island, New York. The species was listed as globally rare (G2 ranking) in 1990. The rarity of this species has made it a conservation priority for managers across its range. After a 40 year absence it was rediscovered on Long Island (including Fire Island) in 1990. Since then National Park Service biologists at Fire Island National Seashore have annually recorded the total number of plants and GPS locations. In 2009 survey efforts were expanded to record the reproductive status, size or spread, and evidence of browsing impacts for each amaranth plant. This additional data provides managers with more information on seed output and contribution of individual plants at their site and to the overall seed bank for this dynamic species.

Keywords

endangered species

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### A Delicate Balance - Public Access and Healthy Ecological Function

What will I get out of this?

Simple rules of thumb to begin crafting equilibrium between site ecology and built environments. Successes, limitations, and implications of choices made at popular recreation destination.

**Abstract** 

Restored and protected natural landscapes with their supporting ecological systems are a central component of open space resources in natural and urbanized areas throughout the world. Sustaining a healthy functioning ecosystem is critical to longevity of the resource and its contributions to the site, the region, and the planet. Human access to those places, in whatever form the built environment takes, will affect the dynamic balance within the system. Human uses and wild nature can coexist, or even thrive and become an ordinary part of daily life if the access systems are conceived to support the natural system instead of dominating and disrupting. This paper examines the successful ecologically-based design strategies employed in balancing public access with a 30+ acre wetland restoration at the heavily used Muir Beach unit of the Golden Gate National Recreation Area just north of San Francisco, with application to similar conditions in other popular parks.

Keywords

Additional

Ecological-design, public-access

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"La Familia": a powerful tool for engaging Hispanic youth in National Parks

What will I get out of this?

The enduring value of engaging sibling pairs in research at Channel Islands National as a way to engage diverse audiences.

**Abstract** 

CSU Channel Islands is a Hispanic Serving Institution (HSI) with an alliance to the National Park through our involvement with the Santa Rosa Island Research Station. This places our institution in a unique position to engage underserved students and youth. This project builds upon the literature that suggests familial engagement with National Parks can provide unique and enduring relationships with these special places. Utilizing students from the CSU Channel Islands this project invited students and their siblings enrolled in local high schools or community colleges to experience the National Park in the company of a trusted family member over a 3 days. As a culture that values collectivistic family values, this initiative speaks to the connection between family members creating trust and opportunities for genuine engagement. Follow up focus groups were used to assess program outcomes regarding a host of learning objectives that included a commitment to future park engagement

Keywords

Diversity, Hispanic, engagement

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Equitable engagement?: Constraints and place attachment of diverse groups in Portland parks

What will I get out of this?

Audience members will gain a better understanding of constraints to park visitation and their effects on place attachment to these parks.

**Abstract** 

This study focuses on urban parks in the Portland, Oregon metropolitan area and examines relationships between perceived constraints to park visitation for traditionally underserved communities (i.e., ethnic and racial minorities) and attachment of these communities to parks. Data were obtained from: (a) a mixed-mode survey (i.e., internet, mail) of a representative sample of ethnic and racial minority residents in Clackamas, Multnomah, and Washington counties; and (b) an internet survey of a convenience sample of Opt-In panel members (Portland area residents interested in park management who signed on to this panel). This study: (a) identifies primary constraints that inhibit visitation to urban parks in this area, and (b) examines relationships between these constraints to visitation and attachment to these parks. Findings will not only inform local management objectives associated with reaching ethnic and racial minorities and engaging them in parks, but they will also inform similar objectives at a national scale.

Keywords

Constraints, place attachment

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10596 Update Session

# Innovative Strategies for Inventory and Monitoring of National Park Service Paleontological Resources

What will I get out of this?

Paleontological Resources Preservation Act (2009) specifically mandates paleontological resource inventory and monitoring. This session shares new and effective strategies and methods for management of fossils.

**Abstract** 

Advances associated with the inventory and monitoring of National Park Service paleontological resources are directly attributed to the rapid development of new technologies and specific legal mandates identified in new federal law. The Paleontological Resources Preservation Act (2009) specifically mandates paleontological resource inventory and monitoring, requiring federal land managing agencies to develop strategies and plans to support fossil management. This session will include presentations which reflect cutting-edge work which is transforming the methods and strategies in paleontological resource management. Paleontological resource photogrammetry, geospatial data acquisition, digital geologic mapping and other technologies collectively enhance opportunities for informing park managers and scientists. The benefits gained through the advances in paleontological resource inventory and monitoring have helped to promote science and stewardship of America's paleontological heritage.

Keywords

Paleontology, Inventory, Monitoring

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Justin Tweet

Integration of Paleobiological Data into All Taxa Biodiversity Inventories: A Temporal Perspective

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The Paleontology Synthesis Project: Data Management and the National Park Service's Fossil Record

Quantifying and Assessing Vulnerability of National Park Service Paleontological Resources

Paleontological Resource Monitoring of Coastal Areas at Point Reyes National Seashore, California

Photogrammetric Applications Supporting Paleontological Resource Inventory, Monitoring and Research

## Positioning for Success in a World of Continuous Change

What will I get out of this?

This session will invite discussion and address key concerns about the future of park resource stewardship in a world of continuous and accelerating change.

**Abstract** 

Parks and protected areas exist in a world of continuous and accelerating change. From altered ecosystems to shifting socioeconomic characteristics, park managers are confronting significant challenges as well as potential opportunities. Resource stewardship must rely on scientific and scholarly information about these changes and application of this knowledge in innovative ways. Conservation scientists must approach these issues as a multidisciplinary community, ensuring that diverse expertise is engaged and that collaboration sparks creativity. We will explore these ideas from the perspectives of emerging thinkers in science, scholarship, and resource management. We will ask how managers, conservation stakeholders, and the public are responding to these challenges, and what new directions may be necessary to sustain conservation success. These issues are especially timely as the U.S. National Park Service enters its second century, and as parks and protected areas remain imbedded in changing physical landscapes and shifting landscapes of public expectation.

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stewardship, science, change

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Engaging citizens through technology in the field - an overview iNaturalist in Colorado's State Parks

What will I get out of this?

Learn how iNaturalist can encourage on-park plant and animal observations and how those data integrate into decision making processes for park use and development.

**Abstract** 

Encourage your citizen scientists and visitors to embrace the digital age and collect data that become immediately available for educational programs and park management decisions. Learn how iNaturalist has been a successful program for Colorado Parks and Wildlife to help document biodiversity. This ongoing effort is providing new ways to connect visitors, staff and volunteers with biological resources. This presentation will focus on an overview of iNaturalist, our State Parks NatureFinder project, the challenges and opportunities that have presented themselves along the way and how these data are utilized for park management.

Keywords

citizen, GIS, technology

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Gnarly problems: examining natural resource climate change adaptation in the NPS through the policy lens

What will I get out of this?

Here we showcase an NPS effort that analyzes current policy regarding adaptation, identifies where further guidance is needed, and provides a foundation for policy evolution.

**Abstract** 

The advent of the NPS' second century is an opportunity both to reflect on 100 years of ground-breaking natural resource management and address emerging challenges. As managers seek to adapt stewardship approaches to an era of accelerating and complex global change, they confront the fact that many natural resource management policies, goals, and core management principles developed within a comparatively static climate paradigm. Efforts to shift management are therefore often considered in the absence of policy that clearly considers climate change and its impacts, and this situation can potentially inhibit effective climate change adaptation. This session features brief presentations followed by a panel conversation with a diverse group of NPS working group leaders who will share analyses of truly 'gnarly,' policy-related park questions about issues as diverse as fire and vegetation management, ecological restoration, endangered species and managed relocation, wildlife and human health, and climate-driven species extirpation.

Keywords	climate change, policy				
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'Resilience' – it's everywhere, but what does it mean in a climate change adaptation context?

What will I get out of this?

Attendees will learn about challenges associated with the term 'resilience' in climate adaptation, and about alternative frameworks and more specific terminology that support collaborative action.

**Abstract** 

Climate change adaptation is a rapidly evolving field in conservation and includes strategies from resisting to actively directing change on the landscape. The term 'climate change resilience,' frequently used to characterize adaptation strategies, deserves closer scrutiny because it is ambiguous, often misunderstood, and difficult to apply consistently across disciplines and spatial and temporal scales. Current definitions of resilience encompass all aspects of adaptation from resisting and absorbing change to reorganizing and transforming in response to climate change. Climate change adaptation practitioners, funders, and stakeholders require clear terminology to articulate and understand management strategies and the inherent tradeoffs involved in adaptation. Language that distinguishes among strategies that seek to resist change, accommodate change, and direct change (i.e., persistence, autonomous change, and directed change) is prerequisite to clear communication about climate change adaptation goals and management intentions in conservation areas. This presentation illustrates the challenges and presents alternative frameworks and terminology.

Keywords

Climate change, adaptation

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Cat Hawkins Hoffman (NPS Climate Change Response Program)

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Gnarly problems: examining natural resource climate change adaptation in the NPS through the policy lens

What will I get out of this?

Here we showcase an NPS effort that analyzes current policy regarding adaptation, identifies where further guidance is needed, and provides a foundation for policy evolution.

**Abstract** 

The advent of the NPS' second century is an opportunity both to reflect on 100 years of ground-breaking natural resource management and address emerging challenges. As managers seek to adapt stewardship approaches to an era of accelerating and complex global change, they confront the fact that many natural resource management policies, goals, and core management principles developed within a comparatively static climate paradigm. Efforts to shift management are therefore often considered in the absence of policy that clearly considers climate change and its impacts, and this situation can potentially inhibit effective climate change adaptation. This presentation will synthesize the work of a diverse group of NPS managers and scientific subject matter experts to analyze truly 'gnarly,' policy-related park questions about issues as diverse as fire and vegetation management, ecological restoration, endangered species and managed relocation, wildlife and human health, and climate-driven species extirpation.

Keywords

Climate change, adaptation

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Either Leave No Trace...or no trace of this park will be left

What will I get out of this?

This session will examine state-of-knowledge of Leave No Trace research, sharing lessons learned and practical implications for management and directions for future research.

**Abstract** 

Messaging promoted through the Leave No Trace (LNT) Center for Outdoor Ethics is the most prominent visitor education strategy in protected areas, with the goal of protecting resource and social conditions by positively influencing behaviors. To influence protected area visitor behaviors, we must understand those cognitive processes that drive behavior, and use that knowledge to influence behaviors in a manner that reduces impact. A growing body of transdisciplinary LNT research including paired recreation ecology and social science approaches has emerged, improving our understanding of scientific processes to protect resource and social conditions. This session will provide case study examples from expert panelists, describing innovative methods, results, and key lessons learned from these studies. Ultimately, this presentation will provide protected area managers and researchers with information that can be used to influence visitor behaviors in a manner that aligns with management objectives, and protects ecological and social wellbeing.

Keywords

LNT, Attitudes, Behavior

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Special events on public lands: Understanding participants' attitudes so we can mitigate impacts.

Diffusion of the Leave No Trace Visitor Education Program in Two U.S. National Parks.

Strategies for understanding off-trail travel in an open-space environment: Pairing observation and self-report data.

Is dispersed pristine-site camping effective? Evaluating a Wilderness Therapy program in Grand Staircase-Escalante

Will they 'leave what they find'? Efficacy of a Leave No Trace program for youth.

Decision support for cultural resources climate adaptation planning: Advancing an optimization model piloted at Cape Lookout NS

What will I get out of this?

Prioritizing historically designated structures for adaptation treatments necessitates continued deliberation of how to best integrate aspects of vulnerability, significance and use potential.

**Abstract** 

Cultural resource adaptation planning requires consideration of multiple and competing values, as well as fiscal, environmental, and technological constraints. Transparent, science-driven modeling can help managers optimize decision-making given climate change uncertainties. In this workshop, we will present the components of a decision support tool developed as a pilot study at Cape Lookout National Seashore. Specifically, we will explain how we integrated the NPS Coastal Hazards & Climate Change Asset Vulnerability Assessment Tool with newly developed indicators of historic significance of NHRP listed buildings and the use potential of those buildings for park operations and visitor services. We will also demonstrate how different management objectives and budget allocations can yield different adaptation strategies. Then, we will elicit feedback on the historic significance and use potential indicators and deliberate the utility of the tool for park-by-park and regional decision-making, as well as other types of cultural resources.

Keywords

CRM, Climate change

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Max Post van der Burg, Research Ecologist, USGS, Northern Prairie Wildlife Research Center

Patrick Kenney, Superintendent, Cape Lookout National Seashore

Jeri DeYoung, Chief of Resources Management, Cape Lookout National Seashore

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Traveling through our past: Documenting historic resources on National Trails and Parkways

What will I get out of this?

Audience members will learn from three National Park Service projects the methods, benefits and challenges of documenting large, linear historic resources.

Abstract

The Appalachian National Scenic Trail and Captain John Smith Chesapeake National Historic Trail are utilizing Multiple Property Documentation Forms to document historic properties along the trails; the Blue Ridge Parkway recently used a comprehensive survey and inventory to inform a National Historic Landmark nomination effort. These projects involve very different types of linear resources---a water-based trail whose historic resources are more than 400 years old; an over 2,000-mile-long foot path built in the twentieth century; and a 469-mile recreational motorway. Each project presents unique challenges, among them: how to document indigenous cultural landscapes within the National Register of Historic Places rubric, best capture a mutable resource on public or private property, adequately record the character of vast landscapes, and distinguish between regional typologies. At the same time, how do we balance the needs of multiple stakeholders? The presentation will address lessons learned, as well as outreach strategy approaches.

Keywords

historic, trail, documentation

Lead author / Session organizer

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Liz Sargent, Principal, Liz Sargent HLA

Virginia H. Adams, Senior Architectural Historian, Public Archaeology Laboratory

## Mining Claims in Selected Wilderness Areas of the Greater Yellowstone Ecosystem

What will I get out of this?

The Wilderness Act permitted mining in wilderness areas. For five pre-1984 GYE wilderness areas, only the New World Mine was a subsequent mining threat.

**Abstract** 

Keywords

wilderness, mining, Yellowstone

The general public may think that mining cannot occur in wilderness areas. However, the Wilderness Act of 1964 permitted new mining claims to be filed in wilderness areas until the end of 1983 and allowed already existing mining claims to be "grandfathered" into new wilderness areas. The eight selected wilderness areas in the Greater Yellowstone Ecosystem (GYE) were designated between 1964-1984 and five of these were designated before the end of 1983. My research sought to determine now many mining claims existed in these five national forest wilderness areas adjacent to Yellowstone and Grand Teton National Parks from pre-designation until now. I was able to answer this question: did this 20-year mining claim window result in more mining claims today? The only attempt at mining in these eight wilderness areas was the New World Mine, next to the Absaroka-Beartooth Wilderness Area, halted through Presidential intervention beginning in 1995.

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# Ocean Acidification: Clarifying and Enhancing NPS Effectiveness in Research and Monitoring

What will I get out of this?

NPS ocean acidification research/monitoring currently occur provincially and bottom-up. Would higher-level coordination improve quality and effectiveness? If yes, how could greater coordination be achieved?

**Abstract** 

Ocean acidification (OA) as a marine manifestation of climate change is gaining ever more attention as an important threat to the health of ocean communities and associated human populations. Marine protected areas like national parks have an important role to play in understanding and responding/adapting to the issue. Currently, National Park Service OA activities (research, monitoring, outreach/education) are mostly de-centralized and originate at the park level. Panelists will present today's NPS programs and emerging initiatives, both internally and with outside agency and institutional partners. The panel will then discuss among themselves and with the audience whether and how the current NPS "grass-roots" model can be enhanced by greater coordination to make the agency's OA efforts more effective, and to maximize the NPS contribution nationally and internationally.

Keywords
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acidification, ocean, marine

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## Advancing the practice and discourse of visitor capacity in parks

What will I get out of this?

Past lessons learned will be applied to new forward thinking frameworks on visitor use and visitor capacity in parks and protected areas.

**Abstract** 

Visitor capacity is considered the amount and types of visitor use that a park unit or zone can accommodate while maintaining desired resource and experiential conditions consistent with the purposes for which the park was established (IVUMC, 2016). Recent increases in visitation has required many parks to confront capacity issues and complex capacity decisions. As managers move forward with the implementation of new guidance related to visitor capacity, the following should be considered: a) is capacity different from use limits, b) are 'multiple capacities' practical and efficient for park managers, c) can managers and researchers 'confirm' when capacity has been addressed, d) do agencies have the institutional and political will to alter use when necessary, and e) can inconsistent monitoring negate the value of capacity decisions? Each panel member will provide a statement about visitor capacity and then engage in an interactive conversation with the audience.

Keywords

Visitors, capacity, research

Lead author / Session organizer

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Did you see that? How differences in attention and perception lead to differences in experience.

What will I get out of this?

Participants will learn the value of human attention and perception. Participants will be urged to consider a new wave of research that examines these issues.

**Abstract** 

Every day we are bombarded with millions of sensory impulses, of which we pay attention to just a few and our individual differences influence our perceptions of these objects. Utilizing eye-tracking technology, researchers can measure what it is people attend to. For parks and recreation, the design of signs, maps, and websites are all things we see and perceive differently than other people. Using measures of visual attention (eye-tracking), we can understand how the presentation of external information influences human behavior. To emphasize the power of subtle differences, we focused our study on the small and seemingly insignificant insect. We took a collection of insects with varied external traits (e.g. stingers, jaws, wings) and assessed human visual attention and perception of these traits through the use of eye-tracking methodologies. During our presentation we will briefly discuss our findings and discusses the application of attention and perception theories to park management.

Keywords

visual-attention, eye-tracking, insect

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10823

Ecotourism impacts on conservation and local livelihoods: A case study of Ranthambore National Park, India

What will I get out of this?

This presentation uses a case study to illustrate how ecotourism impacts conservation and transforms the lives of local residents around protected areas in developing counties.

**Abstract** 

Ecotourism has been recognized as both a boon and a bane for conservation, depending on how ecotourism ventures are conceptualized and structured. If ecotourism enterprises are successfully designed to minimize consumption, generate economic benefits for local communities, support conservation efforts, and enrich and educate visitors and locals alike; they can represent a powerful tool for transforming and empowering rural communities of developing countries. This case study explores the impact of 'tiger tourism' in and around Ranthambore National Park, Rajasthan, India. The qualitative analysis highlights tourism practices in Ranthambore and illustrates the diverse ways in which tourism has benefited the community while also supporting conservation efforts in the park. The Ranthambore case study demonstrates the dire need to study the complex relationship between ecotourism, conservation, and rural community development around parks and protected areas, with the ultimate goal of maximizing benefits for all stakeholders.

Keywords

**Ecotourism, Conservation, Communities** 

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Parveen Shaikh, Sr. Research Fellow, Bombay Natural History Society, India

Dr. Lincoln Larson, Dept. of Parks, Recreation & Tourism Management, Clemson University

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Evaluating visitor support for restricting brown bear viewing at Katmai National Park & Preserve

What will I get out of this?

Understanding visitors' wiliness to restrict their own access to conserve wildlife will become increasingly important as habitat shrinks and visitation increases.

**Abstract** 

Does viewing wildlife, such as brown bears, create an emotional connection within visitors and drive actions for conservation? Katmai National Park & Preserve provides a unique setting to explore this phenomenon as visitors are virtually guaranteed a once in a lifetime brown bear viewing experience. Visitors flood the Brooks Camp area to view some of the 2,200 brown bears feasting on the largest salmon run in the world. Managers must balance viewing opportunities with visitor safety and impacts to bears. Often this results in limiting viewing opportunities. This study explored the impacts of the viewing experience on visitors' support for management polices and pro-conservation behaviors. Data were collected from 235 visitors in July 2016. Results indicate visitors form a strong emotional connection to brown bears and this predicts visitors supporting restricting viewing options ( $\beta$  = .44, R2 = .20). Mangers may consider these results with projected increases in visitation.

Keywords

wildlife, visitor behaviors

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#### A growing trend: Recreational vehicles in public lands

What will I get out of this?

Discusses the state of the recreational vehicle industry and the implications of increased recreational vehicle usage in public lands.

**Abstract** 

Recreational vehicles (RVs) are designed as temporary living quarters for recreational, camping or travel use and include motorized (e.g., motorhomes), towable (e.g., travel trailers) and conversion units. Already owned by 8.5% of American households, RVs are growing in popularity and production. The RV industry is in the midst of its largest expansionary period, with 2016 marking the sixth consecutive annual increase in the shipment of new RVs. Public lands, such as national parks and state parks, are common destinations for RV travelers. This presentation provides an overview of the RV industry, its current trends and potential implications to public land management. Research needs will be discussed.

Keywords

Recreational vehicle, growth

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Climate change and maple syrup quality: A citizen science collaboration at Indiana Dunes National Lakeshore

What will I get out of this?

Attendees will discover a scientific investigation in which local citizens participate in science, learn about climate change, and strengthen their connection with national park resources.

**Abstract** 

Sugar maple (Acer saccharum) is a significant cultural and ecological resource in northeastern North America. Climate change may affect maple syrup production by influencing tree health, the timing and duration of the tapping season, sap quality, and ultimately the availability of trees to tap. ACERnet (Acer Climate and Socio-Ecological Research Network) has teamed up with park staff and citizen scientists to examine the impacts of climate variability on sap flow and quality at Indiana Dunes National Lakeshore. Citizen scientists weigh sap, determine its sugar content, collect sap samples, and record data. ACERnet analyses the phytochemistry of the sap samples and combines the data with that from other sites across sugar maple's range. Through this partnership, researchers gain valuable data from the western part of the species' range. Local citizens gain a better understanding of scientific investigations, climate change, and park resources while strengthening their connection with their local national park.

Keywords

Climate, maple syrup

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## Connecting people and natural resources through social media

What will I get out of this?

With thought and creativity, social media connects diverse audiences to the NPS and its natural resources. Various platforms helped the NRSS directorate receive national attention.

**Abstract** 

Fifteen years ago people heard "America's Storytellers" share experiences through written and print publishes. Now, people can participate and share their experiences through social media, engaging visitors unlike ever before. Taking advantage of this opportunity extended the reach of the 2016 National Parks BioBlitz through vast social networks. This poster summarizes the reach of this event digitally. Presented by the number of hits, likes, comments, and posts garnered, social media proved to be a powerful tool for the NPS to promote and communicate with their primary audience for the event, even at one point trending as one of the top 10 most discussed topics on Twitter during the two day celebration. The success of utilizing social media for the event can be held as proof to park units as well as researchers the benefit of letting strategic and creative technology play a role in their respective missions.

Keywords

social media, science

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# Reimagining the Preservation Workforce, Public Engagement, and Technical Education

What will I get out of this?

Understanding of the NPS ethic facilitates their participation in the preservation of communities and identification of cultural values that reflect their histories.

**Abstract** 

Mather High School was conceived as a way to realize several complementary aims in both preservation and education. NPS recognized an opportunity to begin to train a new generation of practitioners in the preservation trades, in a more hands-on way than had traditionally been available in the US. The NPS saw in the model a means to enhance the educational mission of the organization; increase engagement with the country's changing demographic. The DOE saw an ideal focus for a Career and Technical Education school (CTE), an update of the 20th-century vocational-technical model where instead of being tracked into career skills training or a college preparatory education, all students receive both, with the two curricula (trades and core academic) drawing from one another to produce an engaging, relevant education for a wide range of public high school students.

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Education, Preservation, Hands-on

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#### **Backcountry Use Concentrated within Denali National Park Wilderness**

What will I get out of this?

This paper illustrates GPS Visitor Tracking (GVT) as a technique for understanding visitor use patterns in large protected areas.

**Abstract** 

The capacity for parks and protected areas to accommodate recreational use is an increasingly important issue to consider in the face of social-ecological change. Understanding recreational use through the analysis of travel patterns and use densities is particularly difficult in backcountry settings due to their remoteness and the large areas they encompass. This study used GPS visitor tracking methods to determine use patterns in the backcountry of Denali National Park and Preserve. During the 2016 summer season, spatial data were collected from groups of backcountry hikers; the destination, length, distance, and level of remoteness of Denali backpacking trips were examined. Although the park's backcountry management plan encourages wide-spread dispersion of backpackers to reduce environmental and social impacts, backcountry use was highly concentrated along the park road and clustered within specific areas. Implications include the ways GPS visitor tracking informs managers' decisions about visitor carrying capacity and resource protection.

Keywords

backcountry use, GVT

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Jeff Rose – Assistant Professor in Parks, Recreation, and Tourism at the University of Utah

10849
Collaboration Session

The Next 100 Years: Principles to Guide the National Park Service

What will I get out of this?

By identifying ways to embed the principles of the Urban Agenda throughout the Service, this session will illuminate the potential of NPS to impact communities.

**Abstract** 

As the NPS begins its second century, the agency continues to look for innovative ways to work with communities, leveraging its portfolio of parks and programs. The NPS designed an Urban Agenda to catalyze the adoption of three principles—Be Relevant to All Americans, Activate One NPS, and Nurture a Culture of Collaboration. While these principles were developed regarding the NPS' role in urban areas, they have resonated with the Service. Exploring pioneering work in the NPS, partners, and communities, this session focuses on how parks, programs, and partners can work together to embed these principles in the NPS. Participants will discuss how these principles relate to parks, programs, partners, and communities and how we can enhance the dialogue around these issues and the role of the NPS in enhancing community quality of life. Participants will share examples of the principles in action, and opportunities for expanding those approaches.

Keywords

Collaboration, Relevancy, Parks

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Michael Creasey, General Superintendent, National Parks of Boston

Gayle Hazelwood, Senior Urban Program Manager, National Park Service

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#### The Promise & Challenge of New Parks & Protected Areas

What will I get out of this?

Bringing together practitioners and researchers to identify promising practices in establishing and managing new units allows for knowledge sharing that improves practice and fosters connections.

**Abstract** 

In the US National Park Service alone 23 units have been designated in the past 10 years. New units everywhere hold great promise for protecting important natural and cultural resources, interpreting a more inclusive history, and making connections with diverse communities. In the US and Canada, new units are making connections directly into communities and bridging the gap between natural areas and urban environments. Globally, protected areas are being managed in increasingly diverse and complex governance structures. New units also provide a unique set of challenges and opportunities for governments, non-profits, and communities including governmental support, landowners, partnership and collaboration efforts, philanthropic funding and support, and management.

This session will explore how new parks and protected areas are being established, supported, and managed. We will examine the challenges of designing and managing 21st century parks, how the definition of partnership parks is evolving, and hear from practitioners about promising practices.

Keywords

parks, partnerships, management

Lead author / Session organizer

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Rick Kendall, Superintendent, Marsh-Billings-Rockefeller National Historical Park, Saint-Gaudens National Historic Site, NPS Stewardship Institute

Brent Mitchell, Senior Vice President, QLF Atlantic Center for the Environment

Parks Canada- Invited

CONANP- Invited

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10660 Skills Session

## R Tools for Sampling and for Status and Trend Estimation

What will I get out of this?

Participants will learn R software skills for drawing spatially-balanced samples, drawing GRTS samples, and estimating status and trend for equiprobable and complex survey designs.

**Abstract** 

The National Park Service is tasked with estimating the status and trend of park Vital Signs. In this workshop, two sets of R software tools developed by Western EcoSystems Technology, Inc. (WEST) for meeting these goals are presented: (1) the SDrawNPS package for drawing and analyzing data from GRTS samples, and (2) an R package for estimating trend from complex survey data. The SDrawNPS package combines elements of existing R packages with a graphical user interface for sample selection, status estimation, weighting adjustment, mapping, and R code archival. GRTS sampling from several frame types and status estimation from GRTS samples will be demonstrated. The second part of this workshop will begin by reviewing a simulation study comparing an unweighted linear mixed model to a probability-weighted model. Impacts of design weights and temporal revisit designs on trend estimation are reviewed, and R tools to estimate trend are demonstrated with monitoring data.

Keywords

Status, trend, R

Lead author / Session organizer

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Jonathan Nesmith (Ecologist, NPS - SIEN)

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## SDrawNPS: A Graphical User Interface for GRTS Sampling and Analysis

What will I get out of this?

Participants will learn about R tools with a graphical user interface for drawing spatially-balanced samples, status estimation, and weighting for nonsampling error.

**Abstract** 

Spatially-balanced sampling provides a probabilistic sampling mechanism that avoids selecting locations that are close in proximity and distributes sampling locations more-or-less evenly across the landscape. Generalized random tessellation stratified (GRTS) sampling is a spatially-balanced sampling approach that provides an efficient and flexible alternative to simple random sampling. WEST, Inc. developed a new tool with a graphical user interface for drawing and analyzing data from a GRTS sample of points. The SDrawNPS package combines elements of existing R packages with new features for sample selection, data analysis, mapping, and R code archival. This work is funded by Western Region networks of the National Park Service.

Keywords

GRTS, sampling, status

Lead author / Session organizer

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## **Trend Analysis for Complex Survey Designs**

What will I get out of this?

Participants will learn about different ways to estimate trend in R software and when design complexity should be accounted for in a trend analysis.

**Abstract** 

The National Park Service is tasked with monitoring trend in outcomes of interest, often across challenging landscapes and with limited sampling resources. Sampling design complexity and temporal panel structure incorporate features such as stratification, unequal probability sampling, and revisit designs for statistical and practical efficiency to optimize effort in both time and space. The impacts of design weights and temporal revisit designs on model-based trend analysis are investigated for acid neutralizing capacity measured at Sierra Nevada lakes. An unweighted linear mixed model for trend is compared to a trend analysis of annual design-based estimates and a probability-weighted trend model. Simulations indicate sensitivity of the methods to the revisit design specification, variance composition of the outcome of interest, and the presence of extreme trends in an undersampled subpopulation. This work is funded by Inventory and Monitoring Networks in the Western, Intermountain, and National Capital Regions of the National Park Service.

Keywords

Trend, design, weights

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## Regional vegetation monitoring: emerging themes and challenges

What will I get out of this?

Audience will gain insight into how we are using this regional data to give context to our results and how it can inform management decisions.

**Abstract** 

One of the greatest benefits of long-term vegetation monitoring is the ability to compare the same sites over time, gaining insight into long-term patterns and trends, and sorting local causes from regional phenomena. In the desert southwest a single protocol has been implemented by three I&M networks, with well over 400 sites now established in 19 parks and refuges in the Sonoran Desert and Chihuahuan Desert over the past 9 years. This broad application allows managers and scientists to compare and contrast rates, patterns, and trends at multiple spatial scales, and on lands with similar ecosystems but divergent land management and disturbance histories. At the individual park scale, local results are given regional context for resource protection, interpretation and land management planning. We will present emerging themes from this broad-scale effort, and link our results to key challenges facing land managers in the American Southwest.

Keywords

Vegetation; Scale; Monitoring

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Cheryl McIntyre is a physical scientist/ecologist with the Chihuahuan Desert Network, inventory and monitoring program.

Preserving Parks in a Changing World: A Mixed-Methods Approach at Joshua Tree National Park

What will I get out of this?

Audience members will learn how a mixed-methods approach (manager focus groups and visitor choice modeling) could help managers make decisions despite rapid change and uncertainty.

**Abstract** 

In this poster, I describe an interdisciplinary project seeking to answer: How will environmental and social changes and uncertainty influence management priorities in and visitor perceptions of U.S. National Parks? I conduct research at Joshua Tree National Park (JTNP), a landscape at the center of management concerns about the cultural and ecological consequences of rapid environmental change. Here, I present the results of a focus group with JTNP staff that discussed challenges facing the park and alternative management options in anticipation of those changes. This first phase of the research will lead to the design of a "choice experiment," a survey instrument in which participants make selections among different future scenarios for JTNP, to quantify visitor acceptance of the biophysical and management changes under each scenario. My research will contribute novel insights for the management of vulnerable park systems facing changing environmental baselines and evolving visitor preferences.

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Choice experiment, interdisciplinary

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#### **Geospatial Analytics for Park & Protected Area Decision Support**

What will I get out of this?

Many park and protected area management agencies have yet to generate knowledge from data trapped within visitor reservation databases. I argue that should change.

**Abstract** 

Reservation databases utilized by parks and protected lands (PPLs) are a source of empirical data that holds a wealth of spatiotemporal information about both destination usage (from the supply side) and visitor characteristics (the demand population). Unfortunately, PPL reservation databases are rarely leveraged with these goals in mind. Inductive exploration and geovisualization of reservation data identify longitudinal trends, geospatial patterns and relationships that can help PPL managers generate knowledge useful in decision support. To demonstrate the knowledge that can be gained through geospatial analytics of PPL reservation data, 12.5 million reservation records from the recreation gov database between January 1, 2007 and December 30, 2015 are explored. Both visitor origin characteristics and 3272 distinct destinations providing camping, permitting or ticketing on U.S. Federal PPLs are examined. Similar geospatial analytics and geovisualization approaches can be applied to support tourism and resource management decisions being made by international, national, state and local agencies.

Keywords

Geospatal, analytics, planning

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10647 Challenge Session

Healthy Parks Healthy People: State of the Evidence and Paths to Improve the Science

What will I get out of this?

After learning about the state of evidence, panelists and participants will identify deficiencies and develop strategies for advancing park-based health science.

**Abstract** 

Parks and public lands are increasingly recognized for their diverse contributions to public health. Beyond traditional values such as recreation, new paradigms assess park-related impacts through metrics such as ecosystem service provision and coupled environmental and social health. Directives such as the National Park Service's Healthy Parks Healthy People program and the associated Science Plan have catalyzed research and programming focusing on parks and health. Although scientific understanding is rapidly advancing, many opportunities exist for improving methodological approaches to park-based health assessment, enhancing management of park health resources, and developing health promotion policies and programs based on empirical evidence. This session will feature expert panelists from diverse academic disciplines and agencies describing the state of scientific evidence and practice. After presenting, panelists will lead a facilitated discussion framed around the emerging Healthy Parks Healthy People Criteria Tool to enhance strategies for identifying, monitoring, and managing park health resources.

Keywords

Health, Wellbeing, Parks

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Jennifer Thomsen, Assistant Professor, Department of Society and Conservation, University of Montana

"NPS's Healthy Parks Healthy People Program – Optimizing health values and benefits of public lands"

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

"Parks & Health: The State of the Scientific Evidence"

"Trails as Health Resources: Examples from Montana's Park and Trail Rx Program"

"Participatory mapping: a tool to elicit nonmaterial values and identify the health benefits of nature"

"Urban Parks, Healthy People, and the Pursuit of Environmental Justice"

Valuation study of social and economic benefits generated by Barigui Park to society

What will I get out of this?

This study strengthens the relevance of parks as productive areas, bringing them closer to other processes of human, social and economic development.

**Abstract** 

Barigui Park is the most relevant protected area in the capital of Paraná State. It has 140 hectares and 9 million visitors/year. This study aimed valuating the social and economic benefits generated by the park. The methodology compares scenarios considering the city WITH and WITHOUT this park. In that context, six benefits were considered, such as: 1) Recreation; 2) Green taxation; 3) Impact of personnel hiring and local purchasing; 4) Environmental Education; 5) Scientific Research; 6) REDD. These six social and economic benefits generated by the existence of the park amounted U\$ 14,889.767 versus an annual investment of U\$ 1,413.667. Therefore, for each U\$ 0.31 invested in the maintenance and implementation of the park, an excess of U\$ 3.93 returned to the society as benefit. This information builds an robust argument to new public policies in Curitiba to the implementation and the creation of new areas.

Keywords

benefits valuation, parks

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What will I get out of this?	Value proposition to come (25 words max)
Abstract	Abstract to come (150 words max) ABSTRACT NEVER SUBMITTED
Keywords	keywords to come
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Assessing Climate Change Vulnerability using Measures of Exposure and Terrestrial Resilience

What will I get out of this?

New data for NCR parks shows climate already changing compared to mid-20th century 30 year baseline. High terrestrial resilience lessens vulnerability in some places.

**Abstract** 

To better understand climate change vulnerability and adaptation potential of NPS NCR park resources, NatureServe integrated measures of historic and near-term future climate exposure with measures of terrestrial resilience. Estimates of climate exposure were derived from bioclimatic variables generated annually from TopoWX and PRISM datasets. Terrestrial resilience was measured as a derivative of landscape diversity and connectivity, using data developed by the Nature Conservancy. Results, presented as a series of compelling visualizations for parks and the region, provide managers with specific information about how climate is changing, which areas are most at risk, and which areas are most important for facilitating adaptation. The region is becoming hotter and wetter, with some local variation. Many NCR parks are characterized by relatively high landscape diversity. As pockets of natural vegetation in a fragmented landscape, these parks have an important role to play in facilitating adaptation in the face of climate change.

Key	wo	rds

climate, resilience, terrestrial

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Diane Pavek, National Park Service

www.ExploreNaturalCommunities.org – a place based, interactive website for exploring natural communities at national parks

What will I get out of this?

www.ExploreNaturalCommunities.org engages park staff and visitors in place-based, mobile friendly, interactive maps and multimedia content on natural communities in National Capital Region parks.

**Abstract** 

With NPS support, NatureServe formed a team including ecologists, software developers, writers, and college-level interns to create a mobile friendly interactive website focused on the natural history and natural communities of NPS National Capital Region parks. Starting with Rock Creek Park, the Explore Natural Communities website is now expanding to other parks. With a mobile device (cell phone, tablet, iPad, etc.) and an internet connection, website users can access a map of the park, track their location along trails, query the map for information about nearby natural communities, use pictures of plants and animals that help form the natural communities to learn to recognize them in the field, enjoy prebuilt hikes, listen to podcasts, and watch videos all focused on the natural history and natural communities of the park. Check it out on your mobile device at http://explorenaturalcommunities.org/parks-places/rock-creek-park/mobile-map.

Keywords

mobile, map, plant

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Climate Driven Extent Changes in Perennial Snowfields in Gates of the Arctic National Park, Alaska

What will I get out of this?

Audience members will learn how climate change is affecting both the physical environment and cultural resources of Alaska Arctic National Parks.

**Abstract** 

Perennial snowfields are an important component of National Parks in Alaska. The Arctic is shifting rapidly, and these small, but widespread features are retreating quickly. Reductions in extent have been observed in Gates of the Arctic National Park & Preserve in the Brooks Range. Perennial snowfields are important ecosystems for wildlife, influence hydrology, affect Native Alaskan subsistence caribou hunting, and have implications for cultural resources. Rare, well-preserved archaeological artifacts and paleoecological specimens are sometimes preserved in snowfields. They also influence geology, hydrology, and permafrost distribution. To study extent changes, hydrology, archaeological potential, and relationship to wildlife, a geographic extent model was created. The model utilizes satellite imagery, field data, and caribou movement data. To date, no artifacts have been discovered; however, well-preserved animal remains were identified, and field results indicate agreement with the model. Work is ongoing to address the needs of both scientists and local Native Alaskan subsistence users.

Keywords

Climate, Snow, Arctic

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## Turtle T.H.i.S. (Teens Helping in the Seashore) A Citizen Science Project

What will I get out of this?

Participants will be provided information allowing them to develop research projects which engage youth and produce scientifically sound results.

**Abstract** 

Turtle T.H.i.S. is a research study with three goals; 1) to produce scientifically sound results to manage sea turtle nesting habitats; 2) to cultivate environmental stewardship for sea turtle habitat; and 3) to provide youth field experiences. Gulf Islands National Seashore (GINS) spans 160 miles of Gulf coastline in the states of Mississippi and Florida and due to the nominal presence of development, provides pristine environments for sea turtles. However, nearby anthropogenic light sources are attributed with disorienting hatchling sea turtles and are hypothesized to affect females attempting to lay eggs. This light may reduce how far ashore the adult females crawl to lay eggs. GINS and the Gulf Islands Research and Education Center partnered with the U.S. Geological Survey, National Park Service Night Skies Program, Conservation Legacy, the National Park Foundation, and local high schools to collect nocturnal ambient light data at sea turtle nest locations.

Keywords

research, stewardship, youth

Lead author / Session organizer

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Mark Nicholas, National Park Service

Jeremy White, National Park Service Night Skies and Sounds

Reid Harwell, Pensacola High School

Matt McGregor, Escambia County High School.

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10387 Exhibit --

#### Turtle T.H.i.S. Citizen Science at Gulf Islands National Seashore

What will I get out of this?

GWS participants will recieve details suffiecient to duplicate a research project which is staffed and managed by youth citizen scientists. Interships will be advertised.

**Abstract** 

Turtle T.H.i.S (Teens Helping in the Seashore) is a youth oriented citizen science research project developed to provide park managers with scientifically sound information about ambient light influences on nesting sea turtles and to raise awareness in the community about light pollution impacts to nesting sea turtles. The project has expanded to include an employment ladder, beginning with local high school volunteers, leading to paid summer internship, the next level are post college internships lasting 12 months. This series of internships prepares the students well for seasonal employment and entry level permanent positions in the National Park Service and other land management organizations.

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research, citizen-science, youth

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## Growth in Chinese Tourism to National Parks: A Case Study in West Yellowstone

What will I get out of this?

Audience will learn about recent trends in Chinese tourism to U.S. national parks and the implications for tourism and management in the park's gateway communities.

**Abstract** 

Recently, China has experienced a rapid growth in outbound international tourism. Marketing of Yellowstone National Park and other iconic national parks has amplified Chinese visitation and the parks' gateway communities. While this growth in tourism has many opportunities, park professionals and tourism operators have been faced with challenges for managing the park's resources and the tourists' experience. Despite this continuous growth of Chinese tourism, there has been no research investigating Chinese tourists' motivations and expectations in the U.S. national park setting, their understanding of management practices, and the best strategies for communication and interpretation. This presentation will present a study exploring Chinese tourism in West Yellowstone, the park's major gateway community. The findings, which explore perspectives from Chinese tourists, tour operators, and local business owners, can inform tourism marketing and management of Chinese tourism to national parks and gateway communities in addition to strengthening communications with Chinese tourists.

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Yellowstone, tourism, Chinese

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10543 Compass Session

# GWS Student Summit Reflections: Challenges and Opportunities Facing Protected Areas over the Next Century

What will I get out of this?

This session offers reflections on where we have been and where we are going in protected area management from the inaugural GWS Student Summit.

**Abstract** 

The National Park Service (NPS) centennial represents a time for professionals in protected area management to reflect on the past and look toward the future. The challenges in protected area management are increasingly complex and uncertain. However, these challenges can be viewed as opportunities to further strengthen protected area management and research. Recently, future leaders in protected area management have begun to form student chapters of the GWS and the inaugural student-led summit was convened this past July in Glacier National Park with representation from six universities. Five themes were discussed: unbounding parks, core park values, visitor use management, perspectives on natural change, and reimagining the NPS. During this compass session, summit attendees will provide an overview of each theme and engage the audience in discussions to address the challenges of protected area management in the NPS' second 100 years.

Keywords

student, summit, future

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PhD Student, University of Montana

University of Utah

PhD Student, University of Utah

PhD Student, University of California, Merced

10708 Update Session Making nature-culture connections by broadening metropolitan conservation alliances

What will I get out of this?

Bringing cultural heritage together with natural heritage on equal terms has many benefits. How can metropolitan conservation partnerships move in this direction?

**Abstract** 

This session is an update on the Natural Neighbors concept, discussed at GWS 2015 (see Trzyna, "Natural Neighbors," in the proceedings) and at the 2016 IUCN World Conservation Congress. A new movement to integrate natural heritage and cultural heritage ("Nature-Culture") promises to produce many benefits. It is represented by the USNPS Director's landmark Interim Order 100, "Resource Stewardship for the 21st Century" (2016); and efforts to connect natural and cultural heritage practice in the World Heritage System. Another movement, bringing together conservation actors in metropolitan regions, such as in the Chicago Wilderness alliance, also has great potential. Such alliances include protected area and wildlife management agencies, museums, zoos, aquariums, botanic gardens and local governments. How can these two movements be brought together? This session focuses on the "how."

Keywords

nature, culture. urban

Lead author / Session organizer

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Currently Director, USNPS; will retain stong interest in this topic per discussion with organizer 9-2016

If this is a session of Invited Speakers or a Panel Discussion, additional speakers/panelists and titles of their presentations are given here

Currently Director, USFWS; will be head of American Zoo Assn. at time of conference

Chair, IUCN WCPA Urban Conservation Strategies Specialist Group; Project Director, Natural Neighbors

Urban Fellow, USNPS; anthropologist

VP, American Alliance of Museums; Director, Center for the Future of Museums

10608

Parks and Protected Areas as an Evidence-Based Health-Promotion Context for Veterans with PTSD

What will I get out of this?

Attendees will learn about how parks and protected areas can serve as a health-promoting context for veterans with posttraumatic stress disorder.

**Abstract** 

The National Park Service's Healthy Parks, Healthy People program and current research suggests that parks and protected areas have the potential to serve as a valuable health-promoting context for veterans with posttraumatic stress disorder (PTSD). Evidence-based recreational therapy interventions also encourage the use of nature-based experiences to promote health, wellbeing, and overall symptom reduction among veterans with PTSD. While multiple theoretical frameworks provide potential explanations for the benefits of nature-based interventions, further research will help determine the specific components of these settings that produce therapeutic effects. Furthermore, collaboration among multiple interest groups can enhance the benefits and outcomes of using parks and protected areas as a health-promoting context. Topics addressed in this presentation will include the unique challenges faced by veterans with PTSD, current evidence-based interventions, user access issues, visitor use considerations, and the potential to cultivate an investment in parks and protected areas among the veteran community.

Keywords

Parks, Veterans, Health

Lead author / Session organizer

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Dr. Kelly Bricker is a professor and director of Parks, Recreation, and Tourism at the University of Utah in Salt Lake City. She is also a member of the International Ecotourism Society and the Global Sustainable Tourism Council.

Dr. Daniel Dustin is a professor of Parks, Recreation, and Tourism at the University of Utah. His current research focuses on nature's restorative and resiliency-building properties for veterans, service members, and their families.

10940 Collaboration Session

## Developing a Sustainable Recreation Research Agenda for Public Lands

What will I get out of this?

We want them to contribute their thoughts and ideas toward Developing a Sustainable Recreation Research Agenda for Public Lands.

**Abstract** 

The Forest Service, through its Pacific Northwest Research Station and in collaboration with Colorado State University, are planning a national symposium to re-envision and re-invigorate recreation research about the new planning paradigm of sustainable recreation and tourism on public lands. This session's purpose is to provide a quick presentation on sustainable recreation and tourism on public lands and then follow that presentation with an open interactive group dialogue on what the nature of a research agenda would look like. The design of that engagement would depend on the amount of participants but would most likely involve participatory break-out groups following by plenary presentations of the group results and a final discussion period. The results of this dialogue would then be used as direct input in the national recreation research symposium in the fall.

Keywords

Sustainable Recreation, Tourism

Lead author / Session organizer

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Additional authors / organizers

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## Monitoring and Evaluating Indicators of Recreation Quality on the White Mountain National Forest

What will I get out of this?

Audience members can expect to learn about a method for developing an efficient, sustainable monitoring program of experiential indicators of recreation quality.

**Abstract** 

Research to support monitoring and evaluation of experiential indicators of quality was conducted in White Mountain National Forest (WMNF). A first phase of research focused on arrival counting, and indicator monitoring. A second phase of research focused on development of distribution models of visitor use at study sites, and administration of visitor surveys. These activities were designed to determine the experiential quality of recreation in the WMNF, the relationship between visitor use levels and experiential quality, and visitor evaluation of different levels of experiential quality. The information was used to develop a system for easily monitoring and evaluating indicators of experiential quality on the forest. Monitoring protocols were developed, tested and documented and visitor-based evaluative standards were elicited. This program of research provided WMNF with the tools necessary to deploy an efficient, sustainable and scientifically valid program of experiential indicator monitoring and evaluation.

Keywords

visitor capacity management

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Jeremy Wimpey - Applied Trails Research, Inc.

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## #NatureForAll: Parks at the heart of a global movement to inspire a love of nature

What will I get out of this?

During this session, attendees will develop best practices for connecting new audiences (e.g., youth, urban) with nature to build support for parks and protected areas.

**Abstract** 

#NatureForAll – a global movement to inspire a universal love for nature – was launched at the 2016 International Union for Conservation of Nature (IUCN) World Conservation Congress with over 100 partners. It is now an important new area of work for IUCN that will raise awareness of nature and its values and enable more people to experience, connect with, and take action to conserve nature. Parks and protected areas will benefit from #NatureForAll through increased and sustained support and action for these treasured places. But they and their partners also have a huge role to play in delivering #NatureForAll programs. Building on outcomes of previous international and North American events, feedback on this presentation will contribute directly to on-line best practice guidance for implementing #NatureForAll.

Keywords

youth, urban, connection

Lead author / Session organizer

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Integrating multiple values and environmental behavior reported by visitors to Denali National Park and Preserve

What will I get out of this?

This paper will advance understanding of how values relate to human activities that influence environmental management in the context of a federally designated Wilderness.

**Abstract** 

Human behaviors that benefit the environment are influenced by an array of factors, particularly values that reflect the underlying cognitive processes that shape decisions. Despite the importance of understanding values to inform resource management decisions, few studies have integrated different kinds of values (i.e., cultural, individual, and assigned) to determine their relative effects on behavioral engagement. We share results from a study that explains why people choose to act in environmentally friendly ways in Denali National Park and Preserve. Drawing on a sample of visitors contacted in summer 2016, we found that variation in reported behaviors was explained by cultural cognitions (e.g., egalitarian and hierarchical worldviews), individual value orientations (e.g., egoistic, biopsheric, altruistic), and the perceived qualities of nature (e.g., aesthetics, perceived biodiversity). This paper aims to stimulate a dialogue about how to better characterize the relationship between values and behaviors performed in parks and protected areas.

Keywords

recreation, behavior, values

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10548 Update Session Developing the Process: Initiation, Administration and Delivery of the Inaugural Social Science Park Break Experience

What will I get out of this?

The NPS and researchers identified growing social science needs in the NPS to inform planning and decision-making and have responded by advancing social science initiatives.

**Abstract** 

The purpose of this session is to present on the publication and experience from the Inaugural Social Science Park Break; a Social Science Needs Assessment for Great Sand Dunes National Park and Preserve. The program demonstrates a collaborative effort among social scientists, park managers, and universities to promote proactive, science-based visitor use management. Specifically, the contributing presenters will provide on the administration and delivery of the first social science park break experience. The National Park Services' Social Science Division and the Denver Service Center supported the initiatives in addition to faculty from Clemson and Kansas State Universities. Student perspectives come from the nine graduate students representing six universities from across the U.S. The presenters will discuss the final report, Great Sand Dunes National Park and Preserve Social Science Needs Assessment including the methods, central research themes and how this informs decision-making as well as international transference.

Keywords

park break

Lead author / Session organizer

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Understanding and Informing Decision Making in the NPS: Social Science Initiatives, Planning, and Park Break

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International Transference from Park Break: Integrating Social Science in Parks, Protected Areas, and Cultural Sites

Unplanned trail creation in Gatineau Park, Canada: engaging users in finding a sustainable solution

What will I get out of this?

The audience members will learn about an innovative collaborative approach to find sustainable solutions to unplanned trail creation in a Canadian federal conservation park.

**Abstract** 

Gatineau Park, Canada, receives 2.7 million visits per year. Visitors enjoy hundreds of kilometres of hiking, skiing, snowshoeing, and biking trails. While the official trail network has remained essentially the same, unauthorized new trails have been continuously created by users, such that the network of "unofficial trails" has become larger than the official network. Habitat fragmentation created by trails and conflicts with habitat protection for species at risk have become significant problems for the Park's ecological health. The National Capital Commission has initiated a series of consultations with over eighty user groups to engage them in finding a sustainable solution. Awareness of the negative environmental and public safety impacts caused by unofficial trails was enhanced among user groups and solutions to reduce these impacts were found collaboratively and are now being implemented. Recreational, operational, and natural resource management requirements have been taken into account to arrive at a sustainable solution.

Keywords

trail engagement fragmentation

Lead author / Session organizer

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Human dimensions of aquatic invasive species management in Texas protected areas

What will I get out of this?

Conference participants will learn alternative methods to education and awareness methods that are used to guide users behaviors to align with protected areas management goals.

**Abstract** 

Invasive species are ubiquitous aspect of contemporary protected areas management across people, places, and time. Often, users of parks, protected areas, and cultural sites are unintentional vectors leading to the establishment and spread of invasives. Therefore, managers must develop practices and policies that augment users' behavior in an attempt to reduce or eliminate this potential. Conventionally, practice and polices are disseminated in the form of education and awareness campaigns, which are thought to increase or change behaviors. However, these approaches, by themselves, are known to be limited in their effectiveness at changing behavior and increasing users level of engagement the necessary behavior. This project sought to understand the effectiveness of social norm messaging strategies. Results indicate both regulation messages (focusing users on the law) and social norm messages (focusing user on what others do/approve of) significantly increase users intentions to perform invasives species mitigation behaviors than information/education messages.

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behavior, invasives, norms

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10786 Poster

## 3D Cabrillo: Lessons From Building a 21st Century Rocky Intertidal

What will I get out of this?

Discover how Cabrillo NM produces 3D tactile models to connect the next generation of stewards to our park's natural resources.

**Abstract** 

Our goal as interpreters is to facilitate meaningful connections for park visitors to the resources we protect. We effectively accomplish this goal by linking intangible ideas to tangible objects. Unfortunately, select examples are unavailable for tactile learning purposes due to their high value or fragile nature. Through the 3D Cabrillo program, we initiated a platform to construct 3D replicas of our park's natural and cultural resources. These objects enhance our public interpretive programs at the park and are freely available online for community use. Cabrillo is a leader in science communication in the National Park Service and our 3D program is one innovative example of how we are bringing our nation's parks into the digital age with opportunities for a quickly evolving youth in our local and national communities. With these techniques, we look to raise awareness of park resources and foster excitement for the next century of stewardship.

Keywords

Biomodels, Communication, 3DPrinting

Lead author / Session organizer

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10586
Update Session

NPS and NASA: A Partnership to Address Resource Concerns Through Application of Geospatial Imagery

What will I get out of this?

A partnership to enhance understanding of natural and cultural park resources and responses to stressors through credible science that informs management decisions.

**Abstract** 

Our national park units are experiencing an ever-increasing range of stressors, such as urban encroachment and climate change, which are impacting the natural and cultural resources they were established to conserve and preserve. To better understand how park resources are responding to these stressors, the National Park Service (NPS) has partnered with NASA's DEVELOP Program, using NASA's Earth Observing satellites, to help inform appropriate management decisions. The NASA DEVELOP Program is part of NASA's Earth Science Division with the purpose of developing a scientific understanding of Earth's system and its response to natural or human-induced changes, and to improve prediction of climate, weather, and natural hazards. This session will share several NPS natural and cultural resource projects the NASA DEVELOP Project teams have been working on over the past year.

Keywords

NASA, Partnership

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Monitoring Snow and Ice Coverage in Intermountain Region Parks to Assess Vulnerability of Archaeological Sites

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Seeking Ancient Roadbeds Around Chaco Culture National Historical Park

Monitoring of Tropospheric Ozone Along the Appalachian National Scenic Trail

Monitoring Invasive Bromes in National Park Lands of the Northern Great Plains

NASA DEVELOP Program: Capacity Building through Earth Observations

10808 Fasttrack Session

### Coastal Parks and Refuges as Part of Marine Protected Area Networks

What will I get out of this?

This fast-paced session will explore how Coastal Parks and Refuges are an integral part of MPA networks through video, social media, lightening talks and discussion.

**Abstract** 

This fast-paced, fun session will look at the ways in which Coastal Parks and Refuges are an integral part of marine protected area networks. Coastal areas can both add to and benefit from broader networks of protected areas. Don't think of your park as an MPA? Perhaps it's time you did. We'll explore issues that connect us, including climate change, land/sea connections, invasive species, visitor use and building public support. The session will feature video, social media, lightening talks and discussion covering questions including: What is an MPA network, and why is it important? Making connections, I – building ecological networks to expand our conservation impact. Making connections, II – connecting managers and communities for coastal and marine conservation. Oceans are us – taking next steps for healthy oceans and communities.

Keywords

marine, oceans, coasts

Lead author / Session organizer Lauren Wenzel Director, National Marine Protected Areas Center

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Additional authors / organizers

What is an MPA network, and why is it important?

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Making connections, I – building ecological networks to expand our conservation impact

Making connections, II - connecting managers and communities for coastal and marine conservation

Oceans are us - taking next steps for healthy oceans and communities

11013 Poster

#### **Natural History as a Cultural Resource**

What will I get out of this?

This poster will provide practical guidance on proper long-term curation and preservation of natural history specimens and why it's important to natural and cultural resources.

**Abstract** 

Natural resources are an important part of understanding and managing our national parks. Through scientific studies of these resources, we gain a better understanding of a park's natural environment. Once a study is completed the specimens become important objects that tell not only the story of a park's natural resources, but also the story of its human environment. They become cultural resources. These natural history specimens must be curated and preserved to ensure their longevity for present and future generations. Using best practices in the preservation of natural history specimens allows us to establish cross-discipline partnerships between natural and cultural resource staff. It also allows us to tell a more complete story of how humans are interacting with their natural environment on cultural and social levels. Preserving natural history specimens as cultural resources develops a more complete understanding of park resources and forges new relationships between staff of different disciplines.

Keywords

**Natural History Curator** 

Lead author / Session organizer

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Additional authors / organizers

Lyndon Novotny - National Park Service Ashley Carter - National Park Service

Title of poster: Natural History as a Cultural Resource

Developing a Gateway for Future Land Stewards through Education and Resource Protection

What will I get out of this?

A best practice model on how: 1) a partnership can promote Public Land Hiring Authority, and 2) balancing interns personal development and meeting conservation-related tasks

**Abstract** 

given here

Over the past two summers Lake Mead NRA has partnered with the Great Basin Institute to establish a robust internship program for diverse youth blending outreach, resource management, and individual career development. Outreach activities target recreational boaters and develop awareness about Aquatic Invasive Species (AIS). Education messages highlight sense of place, stewardship, and the interconnectedness between human behavior and species distribution. Natural resource management activities focus on research and restoration activities that showcase the National Park Service's role in resource stewardship. Each intern participates in unique experiences to gain greater self-awareness and leadership skills. Interns completing this program have a gateway toward future positions through the Public Lands Corps Hiring Authority. To date, 23 interns have collectively guided close to 80,000 park visitors on a journey to better understand the delicate relationships between native and invasive species, and tested solutions to slow the spread of AIS.

Keywords	Diverse y	Diverse youth stewardship				
Lead author /	Heather	Whitesides	Aquatic Invasive Species Education Specialist			
Session organizer	National	Park Service,	Lake Mead NRA heather_whitesides@nps.gov			
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Recreation habitat vs. ecological habitat in riparian areas – Managing for both in Yosemite Valley

What will I get out of this?

Learn about "recreation habitat," riparian impacts, and support for management strategies to address impacts in high use riparian areas like Yosemite Valley.

**Abstract** 

Many riparian features important for plants and animals are also attractive to people, but recreation use can seem incongruous with ecological restoration. Using the heavily-visited Merced River in Yosemite Valley as an example, this paper considers what makes riparian zones attractive to visitors and connects high quality recreation with healthy riparian systems. The paper then explores how capacities and other management actions can control amounts and types of use to mitigate adverse visitor impacts, and calls for interdisciplinary projects that recognize how human uses fit with restoration. It also examines Yosemite visitors' perceptions of riparian impacts and their support for management actions that might reduce impacts or restore riparian conditions. Management actions that limit rather than exclude use, focusing on specific problems, impacts, and related behaviors, are more likely to succeed and develop advocates for riparian stewardship.

Keywords	riparia	<mark>n, recreatio</mark> n	n, habitat			
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On the road to capacities -- registration systems, redistribution, and the "self-limitation" ideal

What will I get out of this?

Learn about web-based registration systems that help visitors gauge use levels and redistribute use, possibly reducing the need for permit-enforced capacities.

**Abstract** 

When use is related to impacts, capacities are an effective strategy to protect visitor experiences. But many agencies find it challenging to set capacities or develop acceptable permit systems. Web-based real-time registration systems (RTRs) accurately measure use, while allowing everyone to calibrate the ways use affects high quality conditions.. In concept, visitors may "self-limit" to avoid crowded times, redistributing use and delaying the need for more formal permit systems. Implementing registration before use exceeds capacities also allows visitors, stakeholders, and agencies to re-assess capacities as they are approached, solidifying support or encouraging adjustments. Examples from Wyoming's Snake River, Oregon's Deschutes River, Alaska's Inland Passage, Washington's San Juan Islands, and California's Yosemite Valley show how RTRs have been used to address specific impacts, re-distribute use, or choose better capacities.

Keywords

capacity, recreation, permits

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10820 Challenge Session

The Contextual Landscape Values of Werowocomoco and Captain John Smith Cheaspeake NHT through different vantage points

What will I get out of this?

Challenge participants to see the many layers of values found in extraordinary places like Werowocomoco and the Captain John Smith Chesapeake Historic Trail

**Abstract** 

Four hundred years ago, Werowocomoco was the home and spiritual place of the Algonquian speaking people known as the Powhatans . In 1607, Captain John Smith and the Virginia Colony arrived in this land for exploration and settlement. The land, water and people of the Chesapeake tell the historical story of at least two worlds and two cultures in one place. How can we identify, understand and respect the many values in a cultural landscape context from different vantage points? What tools exist and are being developed?

Keywords

indigenous, cultural landscapes,data

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James Rush, The Chesapeake Conservancy and Captain John Smith Chesapeake Historic Trail

Spiritual Values of the Landscape: Engaging indigenous communities

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The View from the Water: The Virginia Colony arriving in North America in 1607

Identifying the Character Defining Features in the cultural landscape context of Werowocomoco

Indigenous Cultural Landscape Predictive Modeling: Using Data and GIS to identify Cultural and Natural Resources

## Opening a near-wilderness regional park close to Victoria, British Columbia, Canada

What will I get out of this?

To better understand the some of the opportunities and challenges in planning for and managing a large near-wilderness area within a growing metropolitan area.

**Abstract** 

CRD Regional Parks is undertaking a multi-year project to open the Sea to Sea and Sooke Hills Wilderness Regional Park Reserves - together almost 9,000 hectares of near-wilderness set against the rapidly growing Victoria, B.C. metropolitan area. Phase one of the project focuses on opening the Mount Manuel Quimper section and includes: 1) a carnivore risk assessment; 2) a trails assessment; 3) trail upgrades; 4) development of facilities; and 5) development of a communications plan. This presentation will discuss phase one of the park opening and highlights the future planning phases. The Mount Manuel Quimper section provides a perfect example of the inherent challenges in balancing between nature conservation and outdoor recreation as more people with diverse interests, abilities, and levels of outdoor experience choose to visit these close-by regional parks. The importance of near-wilderness areas in shaping an urban population's awareness of and value for nature is also discussed.

Ke		

Park planning, metropolitan

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## Seasonal water use of Saguaro cacti (Carnegiea gigantea) and their nurses

What will I get out of this?

Audience members will learn about a biological phenomena that may explain the distribution and demography of the iconic Saguaro cactus.

**Abstract** 

Saguaro National Park is currently experiencing multiple climate change factors and changes to its native plant community. The impact of climate change on the park's iconic Saguaro cactus is unknown, but survival of young plants has declined dramatically in the past 20 years as the park has experienced higher temperatures and drought. Saguaros are well-known for being part of a nurse-protégé relationship with desert trees and shrubs. This relationship protects young saguaros from extreme temperatures, but may also provide a water benefit to saguaros from nurse trees through ecological phenomena. Our project examines the seasonal use of water in saguaros, their nurses, and if these associations assist saguaros by providing adequate moisture during periods of stress. Further, we evaluate the potential results of decreased winter precipitation and hotter, drier summers on the nurse-protégé relationship and how these changing conditions may impact saguaros for generations to come.

Keywords

climate, desert, precipitation

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The unusual population structure of a pervasive invasive: Sahara Mustard in National Parks

What will I get out of this?

Audience members will learn about evolutionary mechanisms and human drivers promoting invasive species success in National Parks, with hints at how to effectively control them.

**Abstract** 

Sahara mustard has successfully colonized semi-arid Parks eastward from California to Texas and northward into Nevada and Utah since its introduction in the early 20th century. The dispersal and genetic mechanisms that have enabled its success remain unexplored and are a major hurdle in the successful control of the species in National Parks. We sequenced genomes for 943 individuals from 55 locations across the species' range to identify population structure and invasion history. We found evidence for distinct genetic clusters of Sahara mustard but overall genetic diversity was low across sites, perhaps due to the species dispersal modality and natural history. Surprisingly high heterozygosity across the range likely indicates admixture of multiple introduction sites after initial invasions. Overall, we found low levels of genetic structure supporting human-mediated migration. We present Sahara mustard as an eminently-suited study system to understand invasion evolutionary biology, and discuss implications for the National Park Service.

Keywords

invasives, climate, deserts

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## **Aquatic Invasive Species: Challenges and Solutions Across Boundaries**

What will I get out of this?

Will increase awareness of the the nature of the growing threat of aquatic invasive species and engage participants in developing solutions.

**Abstract** 

Keywords

AIS aquatic invasive

Aquatic invasive species (AIS) are among the greatest threats to the integrity of resources, values and uses in protected areas including National Parks. A recent report found that over 300 AIS have been detected within 129 National Park Service units. This information is incomplete and there is high potential for new introductions via trailered boats, fishing tackle and bait, NPS and partner equipment, and release or escape of organisms from aquaria and aquaculture. The risks of invasion are elevated by human use and climate change. AIS compromise fundamental resources and values. The costs of prevention are substantial but typically orders of magnitude lower than costs that result from establishment. This overview of a growing threat will prepare attendees to contribute to solutions by participating in an electronic survey. Results will be used by NPS program staff to establish priorities, develop recommendations, inform issue papers, pursue funding indicatives and inform planning.

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10602 Update Session People, Politics, and Place in the Historic Shaping of America's Western National Parks

What will I get out of this?

Our topic is the evolving understanding of present and absent western national parks. Historians and historical geographers will present the results of original, cutting-edge research.

**Abstract** 

Our session focuses on national parks in the American West. It updates attendees on the shifting understanding of the historic purposes, variable interpretations, and notable individuals at the center of many nationally significant sites. Lary Dilsaver begins by asking why one of the most formative events in western US history – gold and silver rushes – is so badly represented in today's National Park System. Peter Blodgett then surveys the regionally inspired and gender liberating identities that women tourists were encouraged to embrace when visiting western parks during the interwar years. Michael Pretes continues our western exploration by examining the art and science of FS Dellenbaugh whose paintings helped to promote the creation of Grand Canyon and Zion National Parks. Finally, Terence Young argues that the mismanaged Yosemite State Park was more important in the shaping of America's national park system than has been recognized. John Sprinkle will discuss.

Keywords

history, western US

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Why Are There No Mining Frontier Units in the National Park System?

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"In the Wild Heart of America": Tourism, Gender and the Promotion of Western National Parks

Frederick S. Dellenbaugh: Geographer, Explorer, and National Park Artist

Yosemite and the Origins of America's National Parks

Discussant

10593 Poster

## Daily life methods for social science research in parks and protected areas

What will I get out of this?

Attendees will learn about the various 'daily life' methods available for social science park research. Situational implications for each method will be presented.

**Abstract** 

Social scientists regularly employ survey methods and methodologies to assess visitor behavior in parks and protected areas. While often informative and practical, these self-reported, cross-sectional strategies have also been shown susceptible to response biases, such as retrospection and recall errors (e.g., Godbey et al., 2005; Schwarz, 2012; Zajchowski, Schwab, & Dustin, 2016). In contrast, "daily life" methods (Connor & Mehl, 2012) have been shown to reduce the temporal delay between experience and self-report (Reis, 2012) and increase the ecological validity of findings (Czsikszentmihalyi, 2012; McKay, Brownlee, Hallo, 2012). The purpose of this poster presentation is to share a framework that introduces various 'daily life' methods – experience sampling, daily dairies, event reconstruction, visitor employed photography, and head-cam videos – as well as assess their situational utility for park research. Presenters will provide implications for diverse management contexts, as well as diverse research programs (e.g., active living, nature connectedness, benefits-based management).

Keywords

Methods, Experience Sampling

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Dr. Jeff Rose is an Assistant Professor of Parks, Recreation, and Tourism at the University of Utah. His research agenda explores productions of social and environmental (in)justice through the interlocking systemic inequities associated with class, race, political economy, and relationships to nonhuman nature

Dr. Matthew Brownlee is an Assistant Professor of Parks, Recreation and Tourism at the University of Utah. His interdisciplinary research links outdoor recreation and resource management, and provides information to help park and protected area managers plan, monitor, and evaluate visitor experiences

10762
Collaboration Session

## Developing Effective Communities of Practice: Using COAST as an Example

What will I get out of this?

We will brainstorm and discuss what can make communities of practice successful as a communication tool to develop knowledge and shared experience for resource management.

**Abstract** 

Parks contend with a diversity of management challenges nation-wide. With limited staff and declining budgets it is critical that we work together to share knowledge and expertise to protect park resources. The National Park Service is piloting a Coastal and Ocean Advisory and Support Team (COAST). This interdisciplinary focus group will bring together experts and managers from across the Service to share skills, information and knowledge. NPS plans to use Communities of Practice to 1) improve communication between parks, regions and the Washington office; 2) encourage interdisciplinary approaches to issues; and 3) provide the right information at the right time, with little effort, and with efficient use of staff time. As our communities are being developed, we are looking for suggestions and ideas from the field on "What is important to make communities of practice successful?", "What can prevent them from being successful?", and "What are we missing?".

Keywords

Coastal, Ocean, Community

Lead author / Session organizer

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10795 Update Session

## Managing Human Uses and Impacts in Ocean Parks: The Byzantine Marine Scene

What will I get out of this?

Participants will explore how monitoring, application of policy and planning, and diligent outreach and communication can address user impacts in this new discipline.

**Abstract** 

In 2010, over 123 million people or 39 percent of the nation's population, lived in counties directly on the shoreline, with ten million more expected by 2020. Many parks are located squarely in the middle of our crowded coasts and face demands on their resources for marine recreation, seafood, infrastructure, and other needs. The land-based organizational culture of the National Park Service is playing "catch-up" on marine issues. Parks and programs are developing scientific information, garnering public support, and choosing actions to address overuse and degradation of marine resources. These stories can be shared and their value multiplied across parks and other protected areas with aquatic resources to build a community of practice. This session explores how to understand and manage certain priority uses of ocean and coastal parks and brings several valuable case studies and approaches to light.

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coastal, planning, visitors

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Implementing a Partnership Strategy to Increase Marine Resource Protection, Enjoyment and Adaptive Management in

## Dispersed Fishing Use Monitoring Using GPS: Proof of Concept

What will I get out of this?

Audience members will see results and analysis of a low-cost visitor-use monitoring technique including determination of sample sizes for meaningful management application.

**Abstract** 

Description of a project demonstrating a new fishing-activity sampling technique along Fire Island National Seashore beaches summer of 2012. Location-time when fishing was observed was recorded using handheld touchscreen GPS by existing park interns and staff. Sampling times-locations were dependent on people's regular work and varied by location. Most waypoints were logged between May and August 7, 7 am to 6 pm. Combined, searches summed to 1794 kilometers, 228 hours, 209 one-directional search-tracks, and 532 waypoints. Visitor use fishing activity was low to non-existent at the times-locations sampled, except near four locations. Fishing activity increased from May through August. The unstructured sampling provided adequate numbers of observations to compare results between areas and times that were sampled, and to statistically estimate confidence intervals. Some areas, times of day, and many months were not sampled during this proof of concept. The minimum number of samples needed in future studies was estimated.

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none

Visitor-use, GPS, fishing

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## Harmful Algal Blooms and Our National Parks: Developing Plans and Partnerships

What will I get out of this?

Learn new techniques, valuable communication tools, and learn how other parks are responding to harmful algal blooms

**Abstract** 

Harmful Algal Blooms (HABs) are an environmental problem that can have severe impacts on human health, aquatic ecosystems and the economy. Nutrient pollution from human activities such as agriculture, failing septic tanks, and fertilizer use in homes, among other activities, are contributors to the development of harmful algal blooms. For example, in south Florida, critical triggers for algal blooms include nutrients and high temperature. Harmful algal blooms require long term solutions. To that end, the National Park Service (NPS) is a member of the Harmful Algal Bloom and Hypoxia Research and Control Act Interagency Working Group. We are forming partnerships and collaborating with other agencies to detect and quantify cyanobacterial blooms and collect data on harmful algal blooms and associated human and animal illness. The NPS is developing a community of practice, including communication tools and protocols, to help deal with HAB issues in parks.

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