Collaborative Socioeconomic Tool Development to Address Management and Planning Needs

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Introduction

Public lands and resources managed by the National Park Service (NPS) and other land management agencies provide a wide range of social and economic benefits to both nearby local communities and society as a whole, ranging from job creation, to access to unique recreational opportunities, to subsistence and tribal uses of the land. Over the years, there has been an increased need to identify and analyze the socioeconomic effects of the public's use of NPS lands and resources, and the wide range of NPS land management decisions. This need stems from laws such as the National Environmental Policy Act (NEPA), increased litigation and appeals on NPS management decisions, as well as an overall need to demonstrate how parks benefit communities and the American public. To address these needs, the US Geological Survey (USGS) and NPS have an ongoing partnership to collaboratively develop socioeconomic tools to support planning needs and resource management. This article discusses two such tools. The first, Assessing Socioeconomic Planning Needs (ASPN), was developed to help NPS planners and managers identify key social and economic issues that can arise as a result of land management actions. The second tool, the Visitor Spending Effects (VSE) model, provides a specific example of a type of analysis that may be recommended by ASPN. The remainder of this article discusses the development, main features, and plans for future versions and applications of both ASPN and the VSE.

Tool #1: Assessing Socioeconomic Planning Needs

Evaluating the overall social and economic effects of land management actions continues to be an essential component of the decision-making process, and the consideration of these effects is discussed in several agency planning documents (for instance, US Forest Service 1985; Machlis 1996; Bureau of Land Management 2005). However, there is a lack of a consistent framework both within and across agencies regarding how to comprehensively identify social and economic impacts, and many planners, managers, and field staff lack exposure to the

variety of social and economic methods that can be used to analyze them. Further, agencies often have limited planning budgets and time frames to conduct such analyses, requiring a prioritization of the most pressing issues. To help build capacity for socioeconomic analyses and expand on training and education for planners across agencies, social scientists at the USGS partnered with NPS, the US Forest Service (USFS), the Bureau of Land Management (BLM), the US Fish and Wildlife Service (USFWS), and USGS information technology specialists to develop ASPN. A web-based decision-support tool, ASPN provides a consistent framework that assists land management agencies in the identification and prioritization of pertinent social and economic issues to address in their planning processes, and provides guidance on appropriate social and economic methods to address their identified issues, tailored to best meet the needs of the specific plan or project.

The development of ASPN first required the identification of a comprehensive set of social and economic impacts to various stakeholder groups that could result from the wide range of management actions taken by NPS and other land management agencies. These were identified through reviewing agency social and economic regulations, training materials, Environmental Impact Statement documents, as well as through a comprehensive review of the available social and economic analysis documents and guidance used in the US and internationally (for instance, Clark et al. 1998; US Department of the Interior 2001a, 2001b; Bright et al. 2003; Millennium Ecosystem Assessment 2003; Bureau of Land Management 2004; Audit Commission 2005; The World Bank 2005; Erikstad et al. 2008; Allen et al. 2009). The set of possible impacts was reviewed and refined by a group of economic and social science experts comprising agency personnel, university researchers, and others with expertise in these disciplines. Next, a comprehensive review of economic and social analysis methods was conducted, based on both the applicability to land management planning as well as scientific integrity. Initial reviews by the group of experts helped refine the methods, pair them with different intensity levels of analysis, and calculate the time and cost of methods based on their experience in contracting out similar analyses or conducting the analyses themselves. Additional reviews by outside experts were conducted to further ensure the scientific integrity of the suggested methods and accuracy of time and cost estimates. USGS scientists then worked closely with USGS information technology specialists to finalize the web component and add additional features to the tool, including a mapping component, various sources of demographic and economic data, and links to online social and economic planning references. The tool was pilot-tested with agency planners and additional feedback from these field tests was incorporated into the program.

The result of this highly collaborative and iterative process is a web-based tool that assists agencies in identifying and prioritizing social and economic planning issues, and provides guidance on appropriate social and economic methods to address their identified issues. ASPN is designed to provide a consistent framework for natural resource managers and planners to begin to evaluate the socioeconomic effects of management actions on public lands. Its development was driven by NPS and other agency partners, resulting in a product that reflects the needs of all partners. Specifically, ASPN is designed to:

1. Provide demographic and economic data reports for the counties and states within an agency's specified planning area;
2. Help decision-makers identify stakeholder groups that may be impacted by a specific land management action;
3. Help decision-makers identify and prioritize the social and economic issues that may need to be addressed given a specific land management action; and
4. Highlight the range of applicable social and economic methods and analyses that are available to address these issues.

ASPN steps. The specific steps of ASPN are illustrated in Figure 1. Once users log into the program, they are prompted to create an *assessment,* which is made up of one or more *analyses* that start the user through the series of the program. These are flexible and determined by the user, but could represent one alternative in the planning process, various stages of the planning process (pre-scoping, post-scoping, etc.), or one specific action. For instance, an NPS planner may be interested in identifying and prioritizing the social and economic issues associated with the development of new campgrounds in Rocky Mountain National Park.

The user is then asked to specify the physical land unit that the management action is occurring on, for example, Rocky Mountain National Park. ASPN contains geospatial land unit data for NPS, USFS, BLM, and USFWS. A map illustrates the specified land unit in red (Figure 2). The user is then asked to select a *geographic extent* of interest, which entails one of three choices: counties that intersect the federal land unit's borders (shown in yellow in Figure 2), counties that intersect a buffer area 60 miles beyond the federal land unit's borders (shown in gray in Figure 2), or counties that intersect a buffer area 120 miles beyond the federal land unit's borders (shown in orange in Figure 2). This decision drives the results

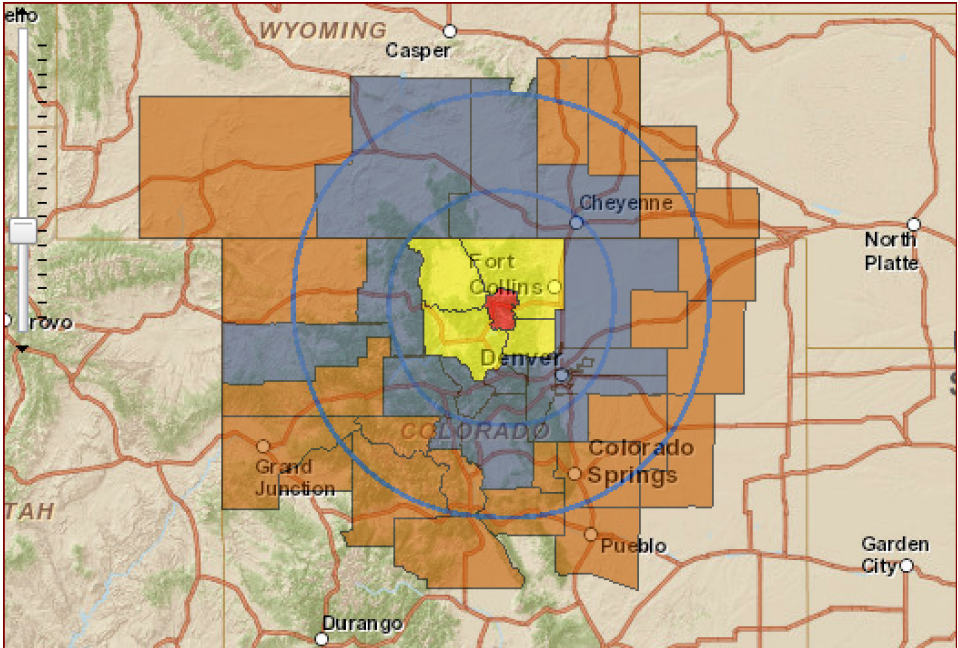**Figure 1.** Series of steps in the ASPN tool.
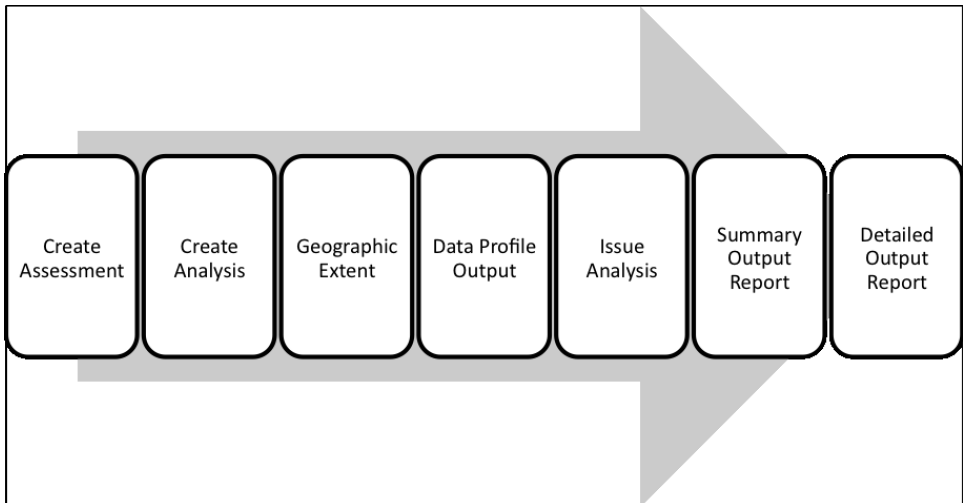
Figure 2. ASPN geographic extent map, using Rocky Mountain National Park as an example.

of the first page of output, referred to as the *data profile*, which produces demographic and economic data reports for each of the counties and states included in the specified geographic extent.

The user is then asked to identify whether six distinct stakeholder groups could be directly or indirectly affected by the management action of interest. These include: community/community residents, interest-based groups/place-based groups/general public, visitors, commercial users, traditional/subsistence users, and tribes.

Definitions of each stakeholder group, including an explanation of why they might be important to consider, is provided. The user is then presented with a series of questions associated with each group, which prompts them to think through and identify the full range of possible economic and social effects of the management action. There are a total of sixty-two questions across the six stakeholder groups, many of which contain several follow-up questions. Each question is associated with a particular issue category, such as access and resource use, demographics, the local economy, infrastructure, health, tribal uses, and values and perceptions. For each of these questions, the user is prompted to identify the level of intensity, categorized as "low," "medium," or "high." Suggested guidance for each intensity level is provided. For instance, a high-intensity issue may be one that is contentious on a local, regional, or national level; highly visible; or involves a significant change in management actions that may impose concentrated impacts on a single entity or stakeholder group. Although some guidance is offered, the selection of intensity level is still somewhat

subjective on the part of the user. This process of identifying impacted stakeholder groups and walking through a series of questions for each in order to identify the full spectrum of potential social and economic impacts is referred to as the *issue analysis* in ASPN. Agency planners and managers can use this list of questions to communicate to other members of a planning team or other agency partners how the social and economic issues associated with the management action were identified.

Next, the user is presented with a *summary output report*, consisting of a series of summary output tables aimed at helping the user prioritize the social and economic issues that may need to be addressed given a particular management action. ASPN also produces a *detailed output report*, which provides a set of recommended economic and social methods to address each individual question identified as being important in the issue analysis. For each method, definitions, benefits, and limitations are provided, along with cost and time estimates. The level of intensity of each issue serves to connect that issue to an appropriate method of analysis. For instance, a low-intensity issue may be adequately addressed with a literature review or method based on the use of existing data, whereas a high-intensity issue is more likely to require primary data collection through surveys, focus groups, etc. This is the type of information provided in ASPN's detailed output report.

Use of ASPN within NPS. The APSN website was launched in April 2014 and is available to all NPS personnel and contractors. The NPS Social Science Branch will be initiating a series of ASPN presentations and webinars to inform and provide assistance to all potential NPS users. It is anticipated that ASPN will provide a valuable starting point for a broad range of NPS users, including decision-makers, on-the-ground managers, and planners. However, it is important to note that while ASPN is meant to inform NPS managers and planners about the social and economic effects of a management action, it is not designed to replace the need for consultation with both internal and external experts in these fields. Additionally, there are specific legal requirements that must be met throughout the decision making process to ensure compliance with NEPA; ASPN does not serve as a replacement for these legal obligations. In most cases, the user will need to consult with social science or economic experts in the NPS Social Science Branch prior to or during the ASPN analysis and afterward to complete the recommended methods of evaluation.

Following the release of the first version in April 2014, it is anticipated that future versions will be developed, which will extend ASPN's functionality and incorporate feature improvements identified in ongoing usability testing with NPS personnel. For instance, several users have expressed interest in incorporating the ability for users to identify a custom set of counties or upload their own shape files in ASPN's geographic extent. This is especially useful when evaluating the potential social and economic effects associated with a new land unit. Additional features of interest include various project management components that could help the user identify a realistic work plan for the social and economic analyses, given time and budget constraints. Regardless of the specific features added to future versions of ASPN, it is clear that the collaborative nature involved in their development will be essential to ensuring that the tool continues to serve the evolving needs of NPS.

Tool #2: Visitor Spending Effects model
While the collaborative ASPN tool was developed to address the broad range of socioeconomic issues that NPS needs to consider, USGS and NPS are also collaborating on tools to address specific socioeconomic analyses. One example is the development of the VSE model, which specifically addresses the economic effects on local gateway communities of NPS visitor spending. Lands managed by NPS serve as recreational destinations for visitors from across the nation and around the world. On multi-day vacations or on day trips, visitors spend time and money in the gateway communities surrounding NPS sites, and these expenditures generate and support economic activity. NPS requires park-level estimates of the effects of visitor spending on local, state, and national economies as key indicators of how parks benefit communities and the American public through visitation. Quantifying these economic effects is essential for multiple planning, management, budget formulation, policy analysis, and public outreach needs, including:

- Informing policy questions and management scenarios that may affect a park's visitation;
- Highlighting returns on investments from federal budget appropriations, and framing the economic importance of park units to park managers, policy-makers, and local government officials; and
- Educating the public on the importance of park visitation, and the ramifications of changes to it due to policy or management decisions.

In 2013, NPS initiated a new collaborative partnership with economists at USGS to develop an improved modeling system to measure how NPS visitor spending cycles through local economies, generating business sales and supporting jobs and income. This resulted in the VSE model, which represents a major revision from previous analyses and establishes the framework for the NPS annual systemwide visitor spending effects report. Many of the hallmarks of the former Money Generation Model (MGM2) are preserved, but the new VSE model makes significant strides in the accuracy and transparency of the analysis. The first annual report using the new VSE model estimated the 2012 economic effects associated with visitor spending at 369 national park units that report visitation (Cullinane Thomas et al. 2014).

In developing the VSE framework, three key pieces of information were required to estimate the economic effects of NPS visitor spending: the number of visitors who visit each park, visitor spending patterns in local gateway regions, and regional economic multipliers that describe the ripple effects of visitor spending in local economies. Visitation source data were derived from a variety of efforts by the NPS Social Science Program. The NPS Visitor Use Statistics Office supplied the detailed 2012 park-level visitation data (Street 2013). Spending patterns were derived from survey data collected as part of the NPS Visitor Survey Project (VSP). Spending data for 56 parks surveyed between 2003 and 2012 were used to represent spending patterns at those parks. Non-surveyed parks were classified into four types: those that have both camping and lodging available within the park, those that have only camping available within the park, those with no overnight stays, and those with high

day use (including national recreation areas, national seashores, and national lakeshores). Generic spending profiles for each of these were developed using data from the 56 surveyed parks. A number of parks were not well represented by the four types constructed using the VSP survey data. For these parks, profiles were constructed using the best available data. Spending and visitation information were then used in conjunction with IMPLAN input-output models to estimate the economic effects at four scales: local,[1] state, regional, and national.

Key findings from the 2012 VSE analysis include:

- In 2012, nearly 283 million national park visitors spent $14.7 billion in gateway communities.
- The ripple effect of visitor spending supported 243,000 jobs in the US economy, more than 200,000 of which are found in gateway communities.
- Visitor spending also provided a $26.75 billion benefit to the overall US economy, including an $18.2 billion benefit to local gateway communities.
- These effects represent a $10 return for every $1 America's taxpayers invest in the National Park Service.
- Most visitor spending supports jobs in restaurants (35%); hotels, motels, and bed-and-breakfasts (B&Bs) (27%); and other amusement and recreation industries (20%).

Continuous improvement and increased rigor for data inputs to the VSE model will be a significant focus for this USGS–NPS collaborative effort into the future. Notably, an effort is underway to establish an NPS socioeconomic monitoring program that will sample park units on a more representative basis. The primary goal of the program is to better understand and represent how visitors enjoy and value our national park system. Socioeconomic monitoring efforts will result in a gain in usable socioeconomic data that will be directly applicable to the VSE model, including additional data on visitor spending and on a variety of demographic and trip characteristics variables that are important inputs to the model.

Example of the NPS application of VSE results. The usefulness and flexibility of the VSE model as a USGS–NPS collaborative tool can be extended to a number of situations where the economic effects from changes to park visitation could evaluate various policy questions, management scenarios, and unexpected changes to park visitation due to factors outside the control of NPS. A recent example of using the VSE outside of its original, intended development is the NPS analysis of the changes in visitor spending as a result of the sixteen-day federal government shutdown during the period October 1–16, 2013 (Koontz and Meldrum 2014). The government shutdown had significant effects on NPS visitation levels, and resulted in forgone spending in gateway communities across the country. To estimate changes in visitor spending, Koontz and Meldrum (2014) compared the visitor spending averages from each park as they were calculated in the 2012 VSE report (Cullinane Thomas et al. 2014) with the three-year average of October visitation from the NPS Visitor Use Statistics Office.[2] This study found that with 7.88 million fewer visitors in October 2013 compared with average October visitation, gateway communities across the country lost a total of $414 million in visitor spending. Also estimated were the changes in visitor

spending for the 14 parks that remained open during the federal government shutdown due to NPS agreements with the respective state governments to fund operations. These results showed that every dollar spent by state governments to maintain park operations resulted in an estimated $10 in visitor spending.

Conclusions

The collaborative USGS–NPS development of the ASPN and VSE tools provides the necessary framework to help answer a wide range of policy questions and evaluate various management scenarios that can have both social and economic impacts to communities, visitors, and the general public. ASPN was designed to improve guidance and training across federal land management agencies, based on their expressed need for more capacity in the realm of socioeconomics. It provides users with the ability to identify important social and economic issues as well as guidance on selecting appropriate economic and social methods to analyze identified issues.

Analyses using the VSE model serve as example applications of a type of analysis ASPN might recommend. In addition to the annual systemwide VSE reports that will be collaboratively conducted by USGS and NPS each year, the flexibility of the VSE model allows it to be extended to a number of situations where information about the economic effects of anticipated or real changes in park visitation can help inform policy and park management. For example, the model was modified to estimate changes in visitor spending due to the shutdown of the federal government that occurred in October 2013. In the future, the model can be further modified to evaluate other scenarios that may affect visitation to NPS-managed lands, such as natural and human-caused disasters. For instance, flooding in Colorado during 2013 resulted in the closing of major roads leading to Rocky Mountain National Park, which negatively impacted park visitation. Another example is a recent oil spill in Galveston Bay, Texas, that has the possibility of negatively impacting visitation to Padre Island National Seashore. For both of these scenarios, the VSE model could be used to estimate the economic effects of forgone spending on local, state, and national economies.

Overall, identifying and evaluating the social and economic effects of actions taken on public lands continues to represent an important component of the planning process. The collaboration between USGS and NPS continues to foster the development of tools to assist land managers and planners in addressing these important issues.

Endnotes

1. The local level includes the counties comprising the local gateway region around each park. The USGS used geographic information system (GIS) data to define the local gateway region for each park unit by spatially identifying all counties partially or completely contained within a 60-mile radius around each park boundary.
2. The Consumer Price Index inflation calculator (Bureau of Labor Statistics 2013) was used to adjust the 2012 spending estimates to 2013 dollars for the Koontz and Meldrum (2014) study.

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