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Applied Geography

Editor's Note: A Sense of Place

Ever since I was a little girl, geography fascinated me. Whether I was riding through the Pine Barrens of New Jersey to visit my grandmother, observing the dollhouse-like towns from a jet plane, or browsing through picture books of beautiful landscapes and people, I was always striving to understand the patterns and complexity of what I saw. These personal perceptions became my world and part of a global geography that seemed intricately interwoven and interdependent. I could see and separate the different components of the landscape. And I became attached to certain places and patterns—some familiar, others exotic—places I wanted to visit or escape to for introspection. The wonder of places, time, and their significance is still with me, even more so now, since I am able to apply these geographical insights to managing special places in the U.S. National Park System.

Geography, and our identification with it, give us a sense of place. Geography also affects the American national identity, and for many national parks is the fundamental reason for their establishment. Therefore, the application of geographic concepts to park management is a natural step. Geography provides the framework, the lines of latitude and longitude, a unique position on the Earth's surface from which park resources can be studied and related. The modeling of landscapes can give us valuable information about the park ecosystem or historical setting, and help us visualize how it will look in the future under various management strategies. Geographic information systems (GIS) and related technologies, such as global positioning systems, are necessary tools for upholding the mandate of the National Park Service (NPS) to manage parks for future generations.

The articles included in this issue of THE GEORGE WRIGHT FORUM exemplify applied geography and originate from presentations made at Spatial Odyssey 2001, an NPS-sponsored GIS conference, held in December in Primm, Nevada. Although this was the such conference to be held by NPS in six years, the participants recommended that we repeat the gathering in 2003. NPS staff, professionals from international and state parks, and other federal agencies attended Spatial Odyssey 2001.

A consistent theme presented in the following articles is the acquisition of spatial (geographic) data in order to define and measure park

systems. The first article, by Bob Johnson and Lee Thormahlen, cartographers with the Minerals Management Service (an agency of the Department of the Interior), educates us about marine boundaries of underwater parks and what happens when lines on a map are based upon the ever-changing natural shoreline. Like the Minerals Management Service, NPS employs cartographers who are responsible for portraying those lines on the maps and maintaining boundary information. These GIS boundary files are the data layer that all other park GIS data overlays and are the foundation of our geographic databases, or geodatabases. Other federal agencies, such as the Minerals Management Service, share the work and are dependent on the accuracy and accessibility of this data. Cartographers play a critical role in compiling legal jargon and survey information into understandable geographic representations, resulting in the imposition of policies and actions on delineated parcels of terrain. Cartographers can better plan land acquisition strategies and recommend the most appropriate boundaries for new parks and additions when they use automated systems to map and analyze the areas under consideration.

We generally think of geography in physical terms, but it also has a human or cultural component. Traditionally, geography is the means to quantify physical features—where the boundary lies and how many acres there are. It also presents a way to characterize an area or types of physical features, phenomena, or patterns. We can think of the varied academic endeavors in geography, such as human geography and demographics, or the use of geoindicators, such as glacial extent or newly formed landslides, to objectively measure physical change upon a landscape. A vegetation map intrinsically represents a habitat; e.g., a spatial pattern of dry hammocks and wetlands implies rich biodiversity. In the second article, the experienced GIS staff at Yosemite National Park—Jan van Wagtendonk, his son Kent van Wagtendonk, Joe Meyer, and Kara Paintner—present a vegetation-based model for fire return-interval analysis. They mapped and studied changes in landscape patterns, which were the direct effects of years of fire suppression policies. This led the team to develop GIS fire management planning applications, including prescribed burns, fuel treatment schedules, and geographic priorities. Similarly, damage to cultural resources in Yosemite can be more accurately estimated using the geophysical variables.

Cultural landscapes, such as national battlefields, archaeological sites, and historic trails, buildings, and landmarks, take into consideration the historical anthropogenic impacts upon the physical earth. They also take into consideration the hu-

man perceptions of and responses to the geography. This issue of the FORUM also contains articles focused on cultural geography studies. Curt Musselman's article walks us through development of a cultural geography study directly applied to park operations and long-term management. His use of scanned historic maps and surveys, global positioning systems, and GIS at Gettysburg National Military Park was key to analyzing the historic landscape. In another article, John Knoerl and Marisa Zoller's innovative work looks at the use of GIS to evaluate and model the impacts of federal legislation on historic districts in Chicago. He promotes the use of spatial provisions (GIS studies) during the development of any legislation to determine if it is appropriate and if it actually improves historic districts and our communities in general. John and Marisa conclude—as most who deal with data already know—that the GIS products and results are only as good as the data that go into the analysis. Danielle Berman develops this idea in her article about database integration. She asserts that open database architecture is a great improvement over the traditional, compartmentalized, stovepipe approach to information management.

The last article, by Yu-Fai Leung, Nigel Shaw, Keith Johnson, and Roland Duhaime, combines cultural and natural GIS applications, linked to the Visitor Experience and Resource Protection framework, to address social impacts on park resources. This model for decision support again demonstrates the role of GIS and geographic data for crossing disciplines and synthesizing disparate information that is more easily understood in a graphic or spatial format. GIS in NPS is, as the article describes, more than a database and has progressed beyond a simple map production tool to a common systematic and scientific way of working.

Applied geography in the National Park Service is indeed more than a database, but as you will learn, it all starts with expensive data collection. The data must be organized in a meaningful and easy-to-use structure. Nearly two hundred individual national park geodatabases have been constructed over the last ten years or so. They have been aggregated into a standardized system-wide geodatabase of points, lines, and polygons for display on the Internet. Because it is standardized, themes and issues that are common to two or more parks can be spatially studied and compared. This enterprise geodatabase can be used in myriad ways, and relates to millions of other data tied to that unique coordinate on the Earth's surface. Over the next few years, many applications like the ones described in this issue of the FORUM will be standardized for easy use and efficiency. The new Internet system is an interactive way

to view and study the fantastic places, phenomena, cultures, and American heritage represented in the National Park System. As the National Park Service continues to develop and refine applied geography, it will become a national legacy of information about park landscapes and human interactions with them, and a tool for improving the success of parks around the globe.

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