

COLLABORATION FOR THE LONG TERM

Though not designed to explore a particular topic in depth, this edition of *Park Science* reveals several common themes in how we in national park research and resource management approach our work. Collaboration, for example, is a thread that runs throughout the issue. The articles reflect the variety, complexity, and sheer number of research questions that have a bearing on park management, and they remind us of the broad scientific community with which the National Park Service enjoys fruitful partnerships. They also illustrate a variety of ways in which particular park information needs are matched with the right expertise, including through Cooperative Ecosystem Studies Units and monitoring networks. Herein we see a small sample of results from current collaborative efforts in national park stewardship. The work is helping managers to improve park safety, recognize and anticipate changes in park resources, interpret historical events that affected park resources and the people inhabiting the area at the time, understand ecological interactions, and maintain park ecosystems.

Another theme is how different time scales—from hours to centuries and longer—have significance for park resource management. For example, satellite imagery can help managers understand park changes within hours or days of their occurrence, such as following hurricanes, wildfires, and other fast-acting disturbances. In these circumstances speedy feedback is essential to identifying and protecting high-priority resources at risk. For other management questions, analysis of a time series of images at intervals of years to decades is appropriate and reveals gradual processes, including changes in native and nonnative vegetation and the types and extent of land use adjacent to a park. A particularly dramatic example of resource change illustrated in this issue is the reduction in glacier mass at Glacier National Park, as documented in photographs over the last century. Modeling suggests that the current rate of climate warming could mean the loss of all glaciers in this park by 2030.

These observations at Glacier have been reported as part of a scientific collaboration called the Western Mountain Initiative, a long-term monitoring program in western national parks that has been ongoing since 1991. Other examples of collaborative, long-term monitoring in this issue come from several park areas, including Channel Islands and Shenandoah national parks. For 25 years researchers have been systematically collecting data about kelp forests at Channel Islands and watersheds at Shenandoah. The value of these data becomes clear when they are synthesized to reveal how park resources are changing and why. This information pertains not only to park management but also potentially to regional and national environmental issues. This knowledge of ecological systems is both exciting and a very important outcome of this fundamental park research activity.

Finally, one of the values I see in this publication is sharing the experience of investigators and resource managers so that researchers and managers in other settings might benefit from their findings. The authors of the report on water quality monitoring at Indiana Dunes tell their story with this very point in mind. Other themes and connections await your discovery.



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