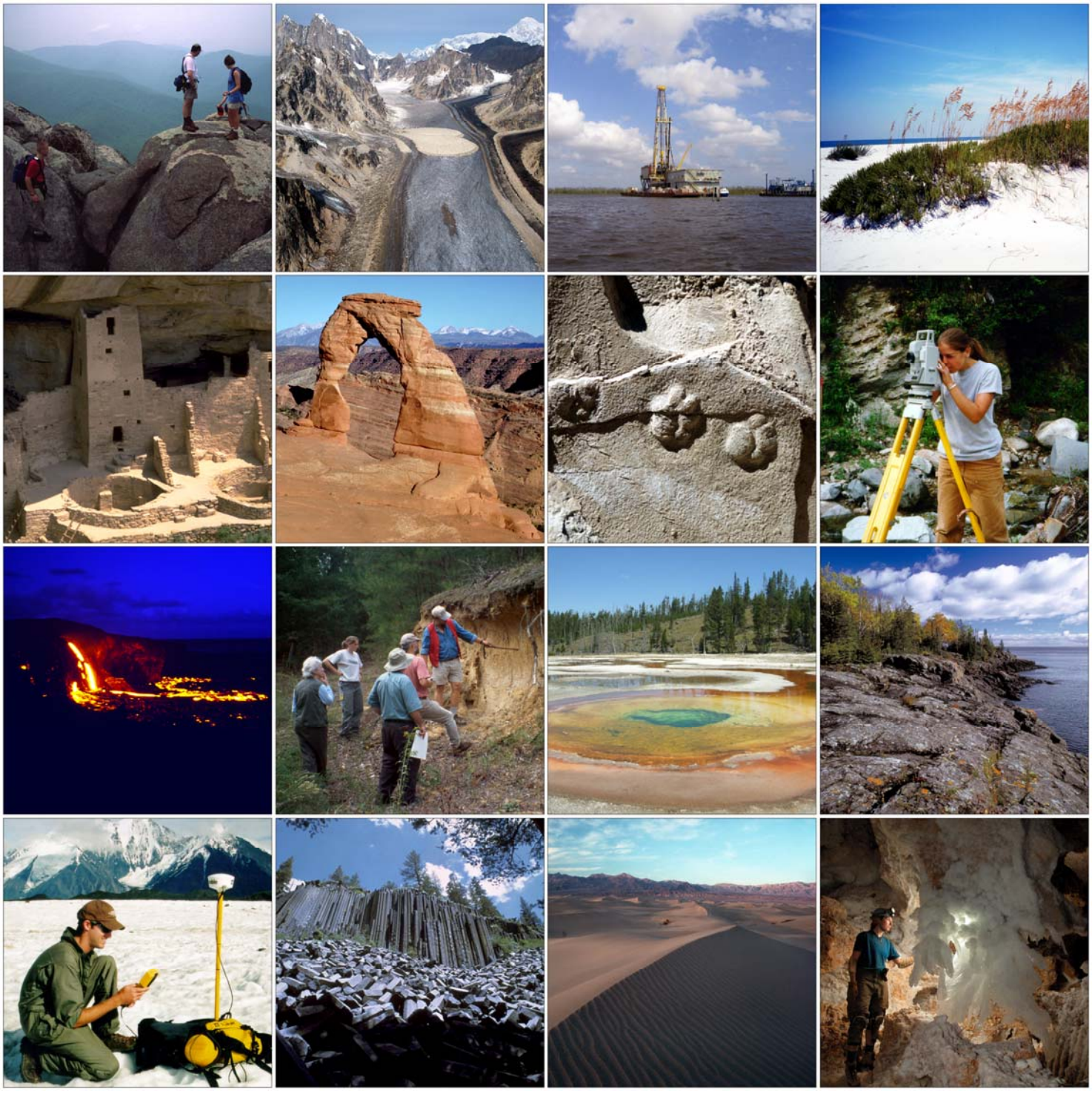
National Park Service
U.S. Department of the Interior

Natural Resource Program Center

Geologic Resources Division

Strategic Plan – March 2008



Geologic Resources Division

Strategic Plan – March 2008

Executive Summary

Across the National Park System, more than 160 parks contain nationally significant geologic resources. Many parks were established to protect significant geological features, landforms, and viewsheds that frame the natural and cultural heritage of our nation. These features include the world–renowned sculptured depths of Grand Canyon, the ancient fossils of Dinosaur National Monument, the longest recorded cave system in the world at Mammoth Cave National Park, the greatest density of arches in the world in Arches National Park, the world's largest and most colorful collections of petrified wood at Petrified Forest National Park, and over half of the known geysers in the world in Yellowstone National Park. Scientifically important fossil deposits are found in 150 parks, 81 parks contain 3,600 known caves, and another 40 parks have known karst systems. Ninety–seven parks protect 7,500 miles of shoreline, 52 parks contain geothermal systems, 38 parks have volcanoes as a major feature, and 37 have active glacial features. Park museum collections have more than 35,000 geological specimens and nearly 416,000 paleontological specimens. Equally important to resource management are the active geologic processes that affect all park units. These processes could be as universal as weathering, erosion, and sedimentation, or may be as regional as major river systems, volcanism, glaciation, or earthquakes.

Taken together, all geologic features and processes make up the parks' geologic framework, which defines the physical conditions that affect ecosystem structure and function. Other elements of the environment, such as climate, interact with this framework to directly affect water quality and quantity, soil properties, and all plant and animal life found in the parks. These relationships are fundamental to understanding human–induced change, informing park planning, and guiding on the ground management actions. Providing the National Park Service with geologic resource leadership and guidance achieves two key objectives: 1) preserve and protect park resources and their cultural, scientific, and aesthetic values, and 2) maintain naturally functioning ecosystems.

It is also important to note that geologic resources present vulnerabilities and risks. There are 716 nonfederal (private and state) oil and gas operations and 1,321 hard–rock mining claims in parks. Twenty–two park units have geothermal resources and 28 parks contain private sand and gravel mining operations. Many of these activities must be carefully regulated and monitored to avoid unacceptable impacts on resources and visitors. Over 10,000 abandoned mine openings and structures pose risks to visitors and represent legal vulnerabilities. Geologic processes such as rockfall and landslides also present safety risks to visitors and facilities and must be accounted for in park planning. In short, failure to consider these activities and their effects in management decisions may result in resource impacts, health and safety issues, legal liabilities, and damage or loss to park infrastructure. Providing the National Park Service with expertise in these areas helps to protect the NPS against these potential legal liabilities and to avoid loss of life and property.

The Geologic Resources Division, in partnership with parks, regions, networks, and others, works to preserve, protect, enhance, and understand geologic features and processes and integrate this knowledge into resource stewardship within the National Park System. The Division is one of five in the Natural Resource Program Center that serves a key role in ensuring that the parks maintain their unspoiled beauty, rich landscapes and abundant resources.

Responding to the challenges facing the Service, the Division developed this strategic plan to focus on the most pressing geologic resource management needs over the next five to ten years. The plan draws on prior input from formal advisory groups, surveys of field staff, and annual technical assistance requests. In addition, the plan is built upon an assessment by Division staff of its programs and capabilities, and links to the 2007 DOI Strategic Plan, which recognizes heritage resources and the

protection and restoration of watersheds and landscapes as a primary natural resource objective. The Division's strategic plan describes its mission and vision, and identifies six emphasis areas that focus on the proven strengths of the Division and future opportunities to enhance park stewardship. Each emphasis area includes an introduction, Servicewide needs, current Division activities, and additional priority actions that would be undertaken with adequate resources. The six emphasis areas are:

- ***Geologic Heritage*** – Assisting park managers in identifying and monitoring features, and preventing and responding to damage to the key geologic features, landscapes, and processes of park units.
- ***Planning*** – Integrating geologic resource information into park foundation documents, general management plans, resource stewardship strategies, and resource–specific implementation plans.
- ***Energy and Minerals Management*** – Providing technical and policy expertise to NPS managers and staff to help them protect the public and park resources and values from past, present, and future exploration and development of energy and mineral resources, and renewable and non–renewable energy projects, in and adjacent to park units.
- ***Restoration*** – Providing park staff and decision makers with technical expertise and policy advice on the restoration of disturbed lands.
- ***Geologic Hazards*** – Promoting the development and use of sound approaches to deal with natural hazards before they result in injury or loss, and integrating evaluation of hazards in park planning to avoid or mitigate their effects, assess their risk, and to prepare for unavoidable incidents.
- ***Climate Change*** – Connecting parks to the scientific information related to climate change impacts and vulnerabilities, an array of potential adaptation and mitigation responses, relevant legal and policy guidance, planning assistance, and communication products and services to park staff to help them effectively respond to the impacts of climate change.

The Division is preparing action plans to carry out the strategies identified in this plan, developing a position management plan, and continuing to provide assistance to parks through Division programs and activities within the Natural Resource Directorate. The Division is also implementing measures to further enhance its effectiveness and efficiencies, and is seeking funds to address the full range of geologic resource management needs in parks. In order to address its current fiscal constraints, the Division has submitted several long–term funding requests for fiscal year 2010, and continues to explore partnership opportunities to support high–priority programs.

I. Introduction

The Geologic Resources Division is one of five divisions in the Natural Resource Program Center and plays a key role in ensuring that the parks maintain their unparalleled beauty, rich landscapes, and unique resources. The Division, in partnership with parks, regions, networks, and others, works to preserve, protect, enhance, and understand geologic features and processes and integrates this knowledge into resource stewardship within the National Park System.

The Division seeks to improve the stewardship of park resources, especially their geologic features and processes, by supporting park inventory, monitoring, research, protection, and interpretation efforts. Geoscience, engineering, environmental protection, and policy specialists provide leadership and guidance to parks throughout the NPS to integrate geologic resource information into the decision making processes.

In many instances, park managers must contend with geologic hazards and the ongoing effects of human activities such as mining, energy, and urban development. Climate change and the increasing demand for oil, gas, and minerals confront park resource managers with a widening array of complex resource management issues. Proven strengths in minerals management, disturbed lands restoration, protection of geologic features and processes, and visitor education and safety allow Division staff to address many of these issues in partnership with the parks, but other issues require the addition of new skill sets and a reconfiguration of the Division's current capacity.

Most parks, regions, and networks do not have specialized geologic expertise and rely on our centralized office for assistance. The Geologic Resources Division is well positioned to effectively and efficiently provide technical, scientific, and legal and policy information for parks, regions, networks, and the Directorate. Being part of the Natural Resource Program Center enables the Division to draw upon multidisciplinary expertise to provide comprehensive solutions to park resource managers.

This strategic plan charts a course for the next five to ten years. The plan summarizes our existing capacities and identifies the need for additional resources or expertise. The plan contains specific steps the Division must take to be successful in integrating critical geologic resource information into management decisions. The Division will evaluate the strategic plan's assumptions annually and update the content as needed. This will ensure that we continue to focus on the most pressing needs of the Service and are using resources efficiently and effectively.

II. Mission and Vision

Mission

The mission of the Geologic Resources Division is to provide scientific, policy, and technical leadership and guidance to NPS resource managers, stakeholders, and decision makers for the protection and management of geologic and interdependent ecosystem resources of the National Park System.

Vision

The Division will continue to provide multidisciplinary expertise and guidance from scientific and policy perspectives to NPS resource managers, stakeholders, and decision makers for protecting, restoring, and understanding the geologic resources of the National Park System. Division staff will address the full spectrum of geologic resources, including soils, geologic features (e.g., arches, canyons, beaches, dunes, caves, glaciers, and fossil beds), geologic processes (e.g., erosion, sedimentation, glaciation, and volcanism), and landscapes. Staff will assist park managers in addressing the consequences of human activities, including mineral and energy development in and adjacent to parks, placement of park infrastructure, and restoration of disturbed areas. The Division will also work cooperatively with experts throughout the Service and with partners to carry out the NPS mission.

III. Emphasis Areas

This section outlines six emphasis areas that focus on providing comprehensive assistance to meet the needs of the parks and the Service. The functions described within each emphasis area address these needs by building upon the proven strengths of the Division's expertise and existing programs. Each emphasis area includes an introduction, Servicewide needs, current Division activities, and additional priority actions that would be undertaken with adequate resources. While the emphasis areas are presented as stand alone functions, they actually have a variety of overlapping dimensions and are often complementary to each other and other programs in the NRPC. For example, maintaining naturally functioning ecosystems is common to all emphasis areas.

The goal of the Division is to provide the needed geologic technical support for NPS managers and external stakeholders with a commitment that the organization and staff will provide effective customer service and flexibility to adjust to changes in priorities, threats and funding. The emphasis areas are presented here in priority order based upon an internal Division assessment. However, we realize that the emphasis areas and their priorities may evolve as a result of a variety of factors such as changes in public policy, management direction, new technologies, and development pressures.

1. Preserve and Manage America's Geologic Heritage

Geologic heritage encompasses geologic features and landforms which may include areas of physical geology, historical geology, economic geology, exploration, and scientific and topographical surveys. Such areas generally have great potential for scientific studies, use as outdoor classrooms, and enhancing public understanding and enjoyment. Geologic heritage features and landscapes are fundamental to understanding surface processes, succession and diversity of life, climatic changes over time, evolution of landforms, and the origin of mineral deposits.

America's geologic heritage is exemplified in the National Park System. The National Park System contains 150 parks with scientifically important fossil resources, 81 parks with 3,600 known caves, and another 40 parks with known karst systems. Ninety–seven parks protect 7,500 miles of shoreline, 52 parks contain geothermal systems, 38 parks have volcanoes as a major feature, and 37 have active glacial features. Parks also contain a tremendous diversity of landforms including dunes, arches, canyons, buttes, and escarpments. Park museum collections have more than 35,000 geological specimens and nearly 416,000 paleontological specimens.

A park's geologic heritage is the foundation for its scenic grandeur. Internationally recognized geologic icons such as Old Faithful, Delicate Arch, Devils Tower, and Half Dome epitomize the National Park System's geologic heritage. Additionally, landscapes defined by the underlying geology have influenced historic events: patterns of human settlement (e.g., Scotts Bluff National Monument, Cumberland Gap National Historical Park, and Delaware Water Gap National Recreation Area), sites of fortifications (e.g., Fort Point, American Camp and English Camp at San Juan Island National Historic Site), locations of battlefields (e.g., Gettysburg National Military Park, Petersburg National Battlefield, and Little Bighorn National Monument), and the industrial development of our nation (e.g., Keewenaw and Klondike Gold Rush National Historical Parks).

Servicewide Needs

Servicewide, the National Park Service needs to determine the extent of the geologic heritage contained in parks, identify management needs, and provide proactive guidance and information to address these needs. Unlike some heritage resources, the scientific and historic value of geologic resources to park visitors cannot be re–created or reintroduced. While geologic features may be viewed as relatively static, these resources are affected by visitors and other external forces (e.g., environmental damage).

Currently, less than 10% of National Park System units with geologic resources have geoscientists on staff to coordinate the research, planning, and surveys necessary for geologic management. Park managers depend on Division assistance in responding to, mitigating, and preventing damage to these resources. For example, of the 150 parks with fossil resources, only 12 parks employ staff with

paleontological training. Visitor impacts, the need for curatorial and preparation work, and the growing theft of fossils driven by rising specimen prices challenge park mangers charged with preserving paleontological and other irreplaceable geologic resources. Coastal parks were set aside to preserve coastal processes, despite increasing pressure from development, storms, and sea–level rise. Park managers dedicated to preserving cave and karst resources must contend with changes to surface hydrology, urban development, and contaminants that permanently alter these features.

Current Division Efforts

The Geologic Resources Division provides park managers with technical and policy support for coastal and surficial geologic processes, paleontological resources, and cave/karst systems, although our capacity to provide this support has diminished with the departure of our paleontological and cave/karst program managers. The Division has also coordinated multi–park workshops that address volcanoes, coastal issues, and geologic interpretation; developed Servicewide guidance for monitoring the condition of geologic resources; and helped the USGS document glacial retreat in parks. Currently, the Division:

- Manages the national soils and geologic mapping efforts initiated by the servicewide Inventory and Monitoring Program;
- Coordinates a literature–based paleontological resources inventory;
- Facilitates geologic heritage–related research by USGS and other scientists;
- Maintains partnerships with the USGS, American Geological Institute, Geological Society of America, American Association of State Geologists, and other professional organizations;
- Assists the National Natural Landmarks Program with geologic site assessments;
- Serves as the NPS representative to the National Cave and Karst Research Institute;
- Provides input to the Department of the Interior regarding proposed legislation related to geologic resources;
- Assists park managers with planning, interpreting, developing, and applying law and policy to decisions regarding geologic heritage; and
- Helps assess the significance of park geologic heritage for the World Heritage Program nomination process.

Priority Actions

Good stewardship of park geologic heritage requires current, detailed information about the location, extent, significance, threats and condition of its resources. The Division will expand its ability to provide information and knowledge about these unique resources to NPS managers by:

1. Filling critical gaps in expertise and increasing capacity to support park management of geologic heritage resources;
2. Compiling Servicewide data, analyzing trends, and identifying threats to geologic features;
3. Promoting and sharing management techniques and information among parks, networks, and regions;
4. Gathering and sharing information on the location, condition, and significance of geologic heritage resources; and
5. Providing national program coordination among other agencies and academia.

2. Integrate Geoscience and Policy Information into Park Planning

Planning in the NPS includes the preparation of park foundation documents, general management plans, resource stewardship strategies, resource–specific implementation plans, and review of other agencies or entities planning documents. Geologic resource management information developed for park planning cuts across NRPC division lines and contributes to other projects and programs such as mitigation of natural hazards, restoration activities, climate change projections, and condition assessments. Early and sustained involvement by Division staff throughout the planning process will help park managers identify fundamental geologic resources and issues, quantify desired conditions, consider a reasonable range of alternatives, and select management actions that integrate all resources in park decision making. An investment of geoscience expertise in park planning will pay large dividends by averting resource problems that, if they were to occur, could be costly or impossible to correct.

Division participation in the planning efforts of other agencies is critical because activities outside park boundaries have the potential to adversely affect parks. Planning initiated by adjacent land management agencies addresses large–scale mineral, energy, and infrastructure development, as well as rule making efforts.

Servicewide Needs

Every park in the National Park System is mandated to have a current General Management Plan (GMP) and Resource Stewardship Strategy (RSS). In FY 2008 alone, the Division is participating in 25 new GMPs and 11 pilot RSSs. Park managers are also requesting assistance from the Division in developing programmatic and implementation plans for a variety of topics such as oil and gas, cave and karst, paleontology, and coastal management.

State and federal agencies routinely invite the National Park Service to be a cooperating agency in environmental impact statements and other land–use planning to avoid possible conflict with development at a later date. Overall, Division and other NPRC specialists have been unable to provide all of the needed assistance because of a lack of staff. Additionally, with limited geoscientists in parks, regions, and networks many park plans are completed without the benefit of input from a geoscientist. In order to effectively respond to NPS planning needs, the Division must fill the gap by dedicating staff with environmental, geology, legal/policy, and engineering expertise to NPS planning efforts.

Park managers are being held accountable through their annual performance plans and Government Performance and Results Act (GPRA) requirements for meeting park resource stewardship goals. With an increased emphasis on accountability for resource protection and preservation in parks, sufficient access to geologic and soil resource expertise is vital for sound, integrated decision making.

Current Division Efforts

The Division assists with the preparation and review of resource–specific plans. To promote an integrated Servicewide resources planning program, the Division:

- Consults with planners on a case–by–case basis on a variety of geologic planning issues (e.g., soils; coastal; geologic hazards; and oil, gas, and mineral development);
- Provides some geoscience resource management assistance for general management plans and resource stewardship strategies;
- Participates in pilot planning projects in conjunction with the NPS's Water Resources Division;
- Participates on planning teams for oil and gas management plans, cave management plans, and plans for external energy and infrastructure development;
- Reviews and provides comments on site–specific development proposals and National Environmental Policy Act documents;
- Participates on the NRPC Planning Technical Advisory Group; and
- Identifies resource management issues during Geologic Resource Evaluation and Soil Resource Inventory scoping meetings that can be incorporated into NPS planning documents.

Priority Actions

The goal of integrating geologic and soil resource management expertise in park planning and decision making is to provide park managers with the information they need to implement management actions that protect and improve resource conditions and ultimately attain desired conditions. The Division will meet this goal by:

1. Increasing its capability to integrate geologic and soil resource management information into park planning;
2. Developing information management systems (databases and Geographic Information Systems) to improve access to and usage of information related to geologic resource management. (Note: This may include the development of a comprehensive Servicewide database that lists geologic features, processes, issues, incidents of geologic hazards, and a summary of past technical assistance requests); and
3. Updating guidance documents and NPS web sites that can inform NPS planners about geologic resource management issues, including scientific, technical, and policy concerns.

3. Avoid, Mitigate, and Repair Damage from Energy & Mineral Development

In apparent contrast to the conservation mandate under the NPS Organic Act, energy and mineral operations exist inside and directly adjacent to numerous National Park System units. As worldwide demand and prices for energy resources and minerals increase, new exploration and development in and around National Parks is surging. In addition, as conventional, non–renewable energy resources are depleted and awareness increases regarding the effect of fossil fuels on climate, park managers are contending with proposals for large–scale renewable and non–renewable energy projects on their borders.

Most staff in parks, regions, and networks lack the comprehensive technical, regulatory, and policy expertise necessary to address energy and mineral development. A long–standing function of the Division has been to provide national leadership in petroleum and mining engineering and geology, regulatory and policy implementation, planning, and impact mitigation.

Servicewide Needs

Surface and subsurface disturbances associated with energy and mining operations can negatively affect natural conditions, cultural resources, and visitor experience as well as human health and safety. Protecting parks from these effects often involves the resolution of complex and sometimes controversial, legal, technical, and policy issues.

More than 230 park units contain nonfederal (private and state) mineral rights. The potential for development of these rights depends on a multitude of factors, including commodity prices, technological advances, growing demand, and transportation infrastructure. In recent years and into the foreseeable future, all of these factors favor energy and mineral development.

Currently, more than 700 nonfederal oil and gas operations exist in parks. Parks contain 1,321 hard–rock mining claims covering a total of 18,161 acres, and federal mineral leases occupy 16,359 acres.

In addition, adjacent energy and mineral development could affect nearly every park unit. External threats to park resources and visitor experience include the development of oil and gas, coal, geothermal, coal–bed methane, oil shale and tar sands, hard–rock minerals, sand and gravel, and energy corridors for power lines and pipelines. At present, adjacent energy and mineral development threatens approximately 50 parks.

Finally, the National Park Service is experiencing an increase in renewable energy projects such as wind power and geothermal. The Service also anticipates the development of other renewable energy projects such as large–scale solar arrays and tidal power projects, and non–renewable energy projects such as oil

shale and tar sands. The Division will work collaboratively with other specialists, agencies and project proponents to address surface disturbance, facility permitting, and mitigating potential impacts to park resources.

Current Division Efforts

- Provides direct assistance to NPS managers in evaluating energy and mineral development proposals in parks and identifies mitigation measures;
- Helps mineral operators inside parks bring activities into compliance with NPS legal, regulatory, and policy requirements;
- Assists with repairing damage from past mining activities;
- Provides leadership on program implementation, and strategic advice on legislation and litigation;
- Integrates technical, regulatory and policy expertise into the development of mineral management plans;
- Develops technical and policy guidance and provides training;
- Compiles and maintains data on the numbers and types of mineral operations;
- Interprets and revises Servicewide regulations;
- Proactively advise NPS Directorate on energy and minerals issues;
- Responds to Department of the Interior and Congressional inquiries; and
- Helps NPS managers advance park protection by evaluating and commenting on other agencies' energy and mineral development actions outside park boundaries. This includes site–specific permitting, programmatic planning, rulemakings and guidance documents, and by advocating the adoption of park protection measures through Department of the Interior's decision making channels.

Priority Actions

The Division will address NPS energy and mineral management needs by:

1. Increasing collaboration with external federal and state agencies to ensure park protection concerns are addressed in their land–use planning documents, rulemakings, and guidance;
2. Advocating that planning documents recognize and mitigate the effects of energy and mineral development in and adjacent to park boundaries;
3. Tracking changes in laws and policies in other federal and state agencies and updating NPS managers on the effects on park resources and park management plans;
4. Expanding its present capabilities to fully address in–park minerals management and external threats to parks from conventional energy and mineral exploration and development;
5. Strengthening existing regulatory authorities (nonfederal oil and gas and hard–rock mining) to increase resource protection and efficiencies, and promulgating new regulations to address other energy and mineral development to further park resource and visitor protection; and
6. Building on past minerals management successes to serve as the Servicewide lead for identifying and mitigating effects associated with renewable/non–renewable energy.

4. Restore and Repair Natural Systems

National Parks are often perceived as the last vestiges of undisturbed ecosystems. However, as of 2007, nearly 440,000 acres in more than 200 park units had been identified in the Performance Management Database System as needing restoration. Disturbed acreage includes active and abandoned mines, roads, coastal engineering projects, dams, canals, railroads, grazed areas, and campgrounds. Some of these features may be of historical significance, but most are not in keeping with the park–specific mandates or the mission of the National Park Service.

Lands disturbed by human activity often cause unwanted and long–lasting problems that affect other resources. Many of these disturbances obliterate soil profiles, lead to exotic plant invasions, result in contamination of water and soil, and accelerate erosion and sedimentation. These damages in turn frequently impair the quality of habitats, disrupt ecosystem functions, coastal systems, and decrease visitor enjoyment and wilderness values.

Servicewide Needs

A search of the NPS Project Management Information System identified hundreds of millions of dollars of outstanding funding needs for over 3,000 projects that identify Goal Ia1A (upland acres restored) as at least one of the project's relevant GPRA goals. The restoration of disturbed lands is a long–term need warranting attention. The amount of work required to meet the needs greatly exceeds current Division funding and staffing capabilities.

One hundred twenty–two National Park units contain 3,184 abandoned mine sites, inclusive of 8,596 underground openings or surface quarries, 81 orphaned oil and gas wells, and 33,000 acres of scarred land. Many of these sites have moderate to severe safety hazards, and many have long–term resource impacts such as environmental pollution, habitat loss, cultural resource degradation or theft, soil erosion, sedimentation, and viewshed degradation. In 1994, the Division produced a report estimating a total cost of $165 million to address abandoned mineral land problems, of which $43 million was required for high priority sites.

Current Division Efforts

- Provides technical assistance and policy advice to park staff and decision makers on the restoration of disturbed lands;
- Administers the NRPP Disturbed Lands Restoration funding source, which provides a competitive source of funding for restoration activities;
- Provides guidance and protocols for inventories of disturbed lands to assist park managers with identifying their restoration needs;
- Provides training to park managers on restoration and related issues; and
- Assists park managers with the development of resource stewardship strategies to ensure that they address restoration needs.

Priority Actions

The Division will strive to restore and repair natural systems by:

1. Increasing funding to address the backlog of park restoration, abandoned mineral lands reclamation projects, and to meet GPRA goals;
2. Providing technical assistance to meet needs identified in planning and condition assessments;
3. Ensuring that park planning documents, including resource stewardship strategies, recognize and address restoration needs;
4. Providing post–restoration support to ensure that the site is on a recovery path that will result in desired conditions; and
5. Developing information management systems to improve access to information for restoration.

5. Improve Awareness and Reduce Damages Caused by Natural Hazards

Active and dynamic processes create and modify the spectacular landscapes in the National Park System. Park visitors assume that they are safe and the land is being managed to preserve the natural character of parks. Only when natural processes conflict with development or other human activities do they become hazards. The severity of such problems is directly related to the extent of human activity or infrastructure in the affected area. Large–scale geologic processes such as major volcanic eruptions, earthquakes, or slope failures can also have important ecosystem impacts, sometimes over large areas.

Every year severe natural events destroy infrastructure and cause injuries and even deaths. Currently, post–incident response has been our primary method of addressing hazard issues in parks. However, in an effort to reduce impacts, the Division promotes the development and use of sound approaches to deal with natural hazards before they result in injury or loss. Park planning documents would be enhanced by including an assessment of natural hazards, mitigating their effects, and preparing for incidents with coordinated risk assessments.

Servicewide Needs

Taking a proactive rather than a reactive approach is vital for protecting visitors and building safe infrastructure in parks and surrounding areas. Servicewide strategies need to be developed for assessing, avoiding, and monitoring natural hazards. In addition, park managers need assistance with managing and disseminating information, developing mitigation strategies, preparing for, and responding to emergencies.

Current Division Efforts

- Responds to incidents related to mass instability and rock fall events;
- Advises park staff and decision makers on the prediction, mitigation, and response to natural hazard events;
- Responds to departmental and Congressional inquiries, provides input to legislative proposals, and coordinates with state and other federal agencies on natural hazard topics;
- Coordinates research and analysis of natural hazards as a result of glacial retreat; and
- Coordinates vulnerability assessments by the USGS for sea–level change and initiates new vulnerability assessments for storm impacts.

Priority Actions

The Division will raise awareness and reduce damages from natural hazards by:

1. Providing mitigation strategies and policy direction to guide park planning on the vulnerability of facilities and visitor safety;
2. Facilitating monitoring of natural hazards in parks;
3. Guiding and brokering hazard research, risk models, and assessments in parks and interpreting the information for park managers;
4. Contributing to adjacent land–use planning to mitigate natural hazards that could impact park resources and ensuring consistency with state and federal natural hazard policies and regulations; and
5. Strengthening links between park management, USGS, other agencies, and the scientific community to improve natural hazard planning, monitoring, research, and response.

6. Respond to Climate Change

Today parks face the challenge of managing resources with respect to climate change. Rates of shoreline erosion in parks are increasing as sea level rises, storms intensify, and storm surges reach further inland. Storm–related erosion damages wildlife habitat and infrastructure, reducing visitor access and recreational opportunities. Lake levels are lowering as a result of population growth, greater evaporation and decreased precipitation, which also affects wetlands and recreational uses such as boating. Ice dependent landscapes, such as glaciers and permafrost, are melting. Recent Servicewide events (e.g., flooding, landslides) suggest that changes are already occurring, at considerable cost to the NPS and public. Changes in temperature and moisture regimes in caves and soils will impact the plants and animals that depend on these resources. These changes will in turn affect other natural and cultural resources, facilities, and the ability of visitors to experience parks for many of the purposes for which they were created.

Servicewide Needs

Park managers have indicated that in order to respond to climate change, they need understandable syntheses of scientific information related to climate change impacts and vulnerabilities, an array of potential mitigation and adaptation responses, relevant legal and policy guidance, planning assistance, and communication products and services. As a whole, the National Park Service is formulating a coordinated strategy for protecting park resources, maintaining visitor enjoyment, and reducing the Service's contribution to greenhouse gases.

Current Division Efforts

The Division has already initiated several projects to help park managers understand and plan for the ongoing and impending changes to park geologic resources. The Division also:

- Coordinates coastal vulnerability assessments which will help park managers address future impacts;
- Produces written descriptions of existing and projected climate change impacts; and
- Participates in the NRPC Policy and Climate Change Technical Advisory Groups.

Priority Actions

The Division will help the NPS respond to climate change by:

1. Incorporating climate change forecasts and implications into the technical and policy assistance to parks in the arenas of planning, mitigation, adaptation, and disturbed land restoration;
2. Integrating its efforts into the overarching climate change response strategy of the Natural Resource Program Center;
3. Facilitating climate change scientific research that will provide the Service with information relevant for the long–term management of geologic resources;
4. Coordinating with partners such as the USGS, National Oceanic and Atmospheric Administration, and the Environmental Protection Agency; and
5. Participating in the development and implementation of existing, revised, and new legal and policy authorities and guidance that will help the Service respond as effectively as possible to climate change.

IV. Conclusion

This document is a result of a Division–wide effort to take a critical look at our current programs, determine the Service's needs, and make recommendations of future priority actions to meet those needs. The functions described within the six emphasis areas address Servicewide needs by building upon the Division's expertise and existing programs. The Division will evaluate the assumptions and update the content of this strategic plan annually, or as needed, to ensure that it continues to focus on the most pressing needs of the Service and is using resources efficiently and effectively.

The Division is preparing action plans to carry out the strategies identified in this plan, developing a position management plan, and continuing to provide assistance to parks through Division programs and activities within the Natural Resource Directorate. The Division is also implementing measures to further enhance its effectiveness and efficiencies, and is seeking funds to address the full range of geologic resource management needs in parks. In order to address its current fiscal constraints, the Division has submitted several long–term funding requests for fiscal year 2010, and continues to explore partnership opportunities to support high–priority programs.

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