



**National Park Service
2010 Resource Information Management Conference
Session Abstracts**

Tuesday Morning, April 20

8:15 Climate Models: what they are, how they work, what they can (and can't!) tell us Scott Denning, Colorado State University

Given present reliance on fossil fuel for energy and economic productivity, very significant climate change is probably inevitable in the coming decades. Mitigating and adapting to these changes will be everyone's business, and managers of parks will be on the front lines. Climate models provide one tool to prepare for and manage change.

Numerical models of the Earth's climate system couple discrete representations of the atmosphere, the oceans, the vegetated land surface, and sometimes other components to describe the present and predict the future. State-of-the-art climate models represent the physical system using grids with spacing of about 100 km in the horizontal, typically with order 50 layers in the vertical. The models are deterministic and must be initialized from a well-characterized present state; they are not statistical or probabilistic. Weather forecasting is an initial-value problem whose solutions depend very sensitively on the initial state, but solutions are subject to chaos arising from nonlinear dynamics and will never be reliable beyond a week or two. Climate prediction is different: it's a boundary-value problem whose solutions are determined by changes in the "forcing" or large-scale characteristics of the Earth system. Climate models will never be able to reliably predict the precipitation in Rocky Mountain National Park in the summer of 2050, but can probably predict its trend over the 21st Century in response to changes in atmospheric CO₂.

9:15 Overview: NPS Climate Change Response Program Angela Richman

2010 marks the beginning of a new coordinated approach on climate change for the NPS with the funding and development of the Climate Change Response Program. This program overview will give some insight into the policy, adaptation and scenario planning, mitigation, and communication strategies NPS is employing to address this critical issue.

10:00 The IRMA Project and the NRInfo Portal Margaret Beer

"IRMA," the Integration of Resource Management Applications, is a WASO-level project that is upgrading and improving the way NPS manages natural resource information. The results of IRMA can be seen at the Natural Resource Information Portal (<http://nrinfo.nps.gov>), which is up and running and provides centralized access to multiple sources of resource information. A new release of the portal (Release 8), scheduled for late May, will result in the consolidation and integration of two "legacy" data applications: NatureBib, and the NPS Data Store. Portal users will soon be able to create, edit, and manage reference records, and retrieve them in a unified application that no longer requires user names or passwords.

10:30 NPS and interagency data sharing Steve Fancy

Data and information sharing and integration are the key to collaboration among Department of Interior bureaus and their many partners in addressing the effects of rapid climate change and other complex and challenging issues. We need to increase the ability and efficiency of DOI and bureau managers, scientists, planners, interpreters, and others at all levels of the organization to search for, find, retrieve, share, and disseminate available data and information, and for bureaus to communicate information to their constituencies, tribes, and the general public, "for it is the broader public that will decide the fate of the resources." Service-oriented architecture and modern information technologies are providing the tools, procedures, and protocols that allow multiple data systems hosting differing data structures to share information.

Show-and-Tell Sessions

10:45 Monitoring visitor use in the Southwest Alaska Network through GIS Susan Rego

Visitor use information captured as part of the Vital Signs Monitoring Program assists the National Park Service in evaluating human impact on ecosystem change. For many of the parks in the Southwest Alaska Network (SWAN) annual commercial use authorization (CUA) reporting serves as the primary mechanism for capturing visitor data. SWAN CUA data is managed in a relational database and has historically been limited to review in tabular form. In March 2009 a project was initiated to establish a spatial framework through which this visitor use information could be transitioned into a GIS for evaluation. A regional dataset of boundaries related to park visitation was subsequently designed and developed, providing the framework needed to join the tabular CUA data into the spatial GIS environment. Monitoring visitor use information into a GIS affords for improved data visualization over simple tabular graphics and facilitates a fast analysis of visitor use volumes and patterns within the parks.

10:50 Data summarization tool – A database application tool for data exploration and reporting John Boetsch

At NCCN we have developed and implemented a series of front-end application modules for project databases with the intent of streamlining application development and maintenance, and for ensuring a more consistent look-and-feel for project staff members who frequently work on multiple projects. The latest of these is a tool for exploring data using a series of pre-built queries that can be filtered by form controls (including park, date range, year, location, etc.). Results can be viewed in tabular form, pivot chart/table, or can be exported to Excel or text formats. My hope in this brief presentation is to show the primary features of the tool, and to generate awareness among the DM/GIS community of the importance of standardizing output and making it easier for project staff to access and summarize their data.

10:55 Online journal literature available to NPS via DOI Library Amalin Ferguson

NPS employees using NPS computers (or NPS VPN) have access to the research literature database subscription services funded/hosted by DOI Library via IP authentication (i.e., no login/password required). A lot of full text material is available. The objective of the show-and-tell is to advertise the service and clarify some confusion about full-text availability (only citations and abstracts are available in many cases), as well as confusion about the scope and timeline of what is covered by the JSTOR subscription. Additionally, the presenter will point out the added-value search utility DOI Library has implemented on their website, which enables end-users to enter a journal title to determine whether any of the DOI funded subscriptions provide coverage of that journal (and to what extent). Alternatively, the end-user may enter the title of a journal article, saving them the trouble of having to browse the covered journal lists for each database service to determine which one to search.

11:00 Accessing data directly from NRInfo using REST Brent Frakes

Data from several services within the NRInfo Portal can be fetched directly by using REST (REpresentational State Transfer)-style web services. REST allows users flexibility in how to access NRInfo data to compose a URL using specific patterns, which then executes a fetch operation to retrieve data. Resources fetched via REST can be output in the form of xml or json. NRInfo services can also transform lists of resources into csv or Excel 2007 types of documents.

11:05 Accessing NRInfo data in R using REST Tom Philippi

REST calls provide a simple way to extract data from NRInfo for analysis and graphing in R. The simplest approach combines ?format=csv at the end of the REST url with read.csv() in R. Error trapping can distinguish between REST services being down, a requested data object not existing (e.g., no certified species list for that category in that unit), and a requested data object having 0 rows (e.g., a unit certifying 0 fish species). Examples will include generating a list of all non-native species, and merging a certified species list to vegetation plot data in order to allow analysis by plant family or nativity status.

11:10 Deconstructing an Example of Complex Cartographic Design Natalya Apostolou

Gateway National Recreation Area (GATE), an urban National Park located in the New York metropolitan area, has just begun its General Management Planning process. GIS has quickly become an indispensable tool for synthesizing complex information and producing succinct visual displays for park staff as the planning dialogue begins. The intense urban nature of GATE presents an interesting challenge for mapping “how park land is used for visitor recreation,” as the types/locations of recreation opportunities are quite varied. Sound cartographic design was needed to meet the

challenge of graphically displaying “what,” “where,” and “to what extent.” This “show-and-tell” presentation will deconstruct an example of one such map which was designed for the purpose of examining the multi-faceted concept of “visitor experience” within the context of long-term planning. Deconstructing the map will highlight the elements of cartographic design that allow for both a “micro” and “macro” snapshot of visitor recreation.

11:15 Creating a spatially-searchable electronic reference library using web-based GIS Kim Hastings

Traditional library catalogs allow searching for documents by keyword or content, but NPS resource managers often need to search for documents relevant to locations best identified as points or polygons on a map rather than as keywords. Yosemite has created a protocol for associating documents with sets of features in parkwide GIS layers. This allows users to search for documents using the spatial selection tools found in a GIS. Additionally, we are using Geocortex Essentials (in conjunction with ArcGIS Server) to create a user-friendly web-based GIS application that makes the search process intuitive, precluding the need for advanced ArcGIS training for most users. The same application can also be used to initially associate documents with features as they are checked into the document library.

11:20 Delivering GIS data to Non-GIS users through a Web interface Bill Slocumb

In order to make sound management decisions, resource managers need access to increasingly large amounts of spatial and tabular data, e.g. LCS, biological inventories, vegetation monitoring, fire history, and Lands Resources. These data must be easily accessible to users who are unfamiliar with GIS or linking tabular data with maps and visual displays.

The Northeast Region is developing an Enterprise environment capable of providing a wide range of data to resource managers with only an Internet connection and web browser software. The environment is designed to provide user friendly access to map data and supporting documentation. Customized queries have been developed to increase efficiency and ease of use. In addition, map and query report printing are available. Applications include:

- Cultural building significance, latest assessment condition, and associated photographs
- Location of vegetation species and condition
- Tract status and estate with links to Land Resources Division deeds
- FMSS replacement value
- Fire history

Preliminary testing has indicated the system approaches desktop speeds.

11:25 The use of the R statistical package for data analysis of Pipestone National Monument’s prairie vegetation community Lanna Jin

The objective is to present preliminary data analysis of the native and restored prairie vegetation communities’ collected from ten plots within the Heartland Inventory & Monitoring Network’s (HTLN) Pipestone National Monument (PIPE). In the data analysis, we use the R statistical package to better comprehend the success of the native and restored prairie monitoring program. Using data obtained from the HTLN’s plant community database (VEGMON), we analyze spatial and temporal trends in PIPE’s vegetation communities. In doing so we seek to address questions, such as, the degree of success to which vegetation composition in restored communities recover over time to that of native communities. The analysis has the potential to help park managers understand the long-term trends of vegetation communities and can be used as a tool for assessing park management maintenance and/or management strategies within the park.

Tuesday, April 20
Afternoon

1:00 Concurrent Session 1: Remote sensing and LiDAR Session Chairs: Kathryn Mellander, Dave Duran, Mike Story

1:00 – 2:40 Remote sensing applications for monitoring and change analysis

- **Challenges of monitoring natural disturbance processes in North Coast and Cascade Network using remotely sensed data: comparison of approaches** Natasha Antonova
- **Using advanced satellite products to better understand I&M data within the context of the larger ecoregion** Jeff Morisette
- **Use of UAS for monitoring of resources: NPS-USGS partnership** Jim Traub and Mike Hutt
- **QuickBird image processing: lessons learned** Carrie Guiles

3:00 – 4:00 LiDAR Technical updates and applications

- **GeoEarthscope and Opentopography: LiDAR projects and accessibility** Christopher Crosby
- **Using LiDAR to determine the forest vegetation structure of Prince William Forest Park and Catoctin Mountain Park** Geoff Sanders
- **LiDAR handling in ArcGIS 9.3 and 10** Tim Clark

1:00 Concurrent Session 2: Managing continuously-collected data Session Chair: Ann Rodman

Continuous data collection is becoming more widespread in parks and I&M programs, and it presents multiple challenges related to data processing, analysis, archiving, and retrieval. While no perfect solutions exist, some programs and parks have developed procedures and workarounds to meet immediate and longer-term needs.

SWAN Continuous Water Quality Monitoring Cuyler Smith

With the widespread use of electronic data-loggers, capable of measuring various water quality parameters continuously, the Southwest Alaska Network (SWAN) has identified a significant need to more efficiently store and retrieve these continuous data. Storing and retrieving continuous water quality information, both data and metadata, in a central database will enable the project manager to consolidate, aggregate, and analyze more easily. The current method of storage involves numerous files of different formats stored in various locations, a method which works well for small amounts of data due to its simplicity, but does not scale well for larger datasets. The proposed method of using an enterprise level database (SQL Server) to store and retrieve continuous water quality will allow SWAN to focus on analysis and reporting, rather than the aggregation and consolidation of water quality data. Herein I will discuss SWAN's approach to processing and managing continuous water quality datasets.

Management of Air Quality Monitoring Data Debbie Miller

The Air Resources Division manages air quality data collected from monitors across the country. These are large data sets, with measurements collected at frequencies ranging from weekly to hourly. The validated raw data are processed into summary statistics that are used to assess the status of air quality within parks. Currently the data are processed by different agencies and stored in separate databases; the Division plans to develop a system that will allow for simplified access to air quality information on parks through a single interface.

Sounds: Managing the Transient Damon Joyce

Currently, the Natural Sounds Program collects continuous MP3 audio and second by second decibel data. The main challenges are storing these 40Gb datasets, querying sound data from a 9hr recording, and comparing data collected from different sources with different standards. Workarounds to the first two problems will be discussed, as well as ideas for future implementations.

Continuous Data Collection in Florida and the U.S. Virgin Islands Judd Patterson

The South Florida/Caribbean Network has a network of water temperature data loggers and weather stations deployed within its parks. The 58 water temperature data loggers on coral reefs and 3 land-based weather stations provide a large stream of data. Our current solution involves conversion from HOBO data files into an Access database where the data is cleaned and verified. The valid data is then exported via VBScript to an Excel template with prebuilt graphs.

Analyzing spatial and temporal data from GPS collars on Grizzly Bears Tyler Coleman, Andrea Amparore (presented by Ann Rodman)

A huge amount of data has been collected from grizzly bears with GPS collars and from backpackers with GPS units travelling through the same area of Yellowstone's backcountry. Some of the questions we tried to answer with the data include 1) when and where were bears and humans close to each other?, 2) do bears come into campsites when the campsites are occupied or empty?, 3) do the bears come into the campsites during the day or night? Some techniques were invented to analyze the temporal part of the data and the authors would love to figure out a better way. A primary goal of this presentation is to gather new thoughts from smart people in the audience about more efficient ways to look at this type of data.

1:00 – 5:00 Tech Open House

A chance for you to work one-on-one with WASO staff and specialists.

Laptop computers with wireless Internet and VPN intranet access will be set up for:

1. User feedback on the NRInfo Portal. NRInfo project staff need your opinions on how the portal works for you, including navigation, search tools, and overall functionality. Stop by and use the portal, and provide your feedback to user analysts. This is an opportunity for you to directly influence the direction and design of the portal.
2. General tech support and questions. Technical support on a variety of topics will be available on a walk-in basis, or you can sign up ahead of time. Participating WASO staff, along with their expertise, include: Simon Kingston (Access, SQL Server); Alison Loar (NPSpecies); Fagan Johnson (websites); Kathy Dratch (SharePoint); Stephanie Shupbach and Mara Kali (GIS); Dean Tucker (STORet), Mifta Ahmad (SQL Server), NPS Focus (McDonald, Creamean)

4:30 – 6:30 Poster Session

Poster authors will be available to answer questions and provide further information about their posters. (Note: some authors may need to leave early to attend the Python class beginning at 5:30)

5:30 A quick introduction to generating script tools with Python Benjamin Zank

This course was developed as a class lab for an Advanced GIS course and Western Carolina University. Students will get a very brief introduction to the Python programming language and the PythonWIN IDE, which they will use to create a script to simulate a series of coin tosses. Moving on from there, we will learn how to access tools in the ESRI Geoprocessing Program Model via Python in order to run ArcToolbox tools through python scripts. In the final portion of the exercise we will string a series of geoprocessor functions together and attach them to a script tool in ArcCatalog.

Wednesday, April 21
Morning

8:05 What's new in ArcGIS 10 Tim Clark and Tosia Shall (ESRI)

This session highlights new tools and capabilities in ArcGIS Version 10 using Yosemite National Park data as a backdrop and case study. In the extended session, participants will learn more about ArcGIS capabilities for cartography, editing, and GeoDatabases.

Show-and-Tell Sessions

9:15 Custom user tools in NCPN vegetation mapping geodatabases Russ DenBleyker The Northern Colorado Plateau Network is completing its vegetation mapping inventories and distributing a geodatabase to parks along with the reports. Most NCPN parks do not have a GIS technician on staff and therefore have difficulty using the geodatabase to retrieve information. We have created tools which enable users to select any plot on the map and display a list of species found at the selected plot and display thumbnails of all photos taken at the plot just by clicking custom buttons. The user can also select a polygon on the map and click a custom button to display a pdf of the map unit description associated with the selected polygon.

9:20 Data Bundling for Dissemination Rachel Vargas

At the South Florida Caribbean Network we create a web interface for each of our Vegetation Map Projects and burn these onto DVDs. The Web interface includes the project report, project data, ArcMap project, project summary, and project metadata. We currently include a DVD in each of the Final Reports we send to our parks. These DVDs provide a consistent format that is familiar to our parks and cooperators.

9:25 Network technical reviews – status of the benchmarks workgroup John Boetsch

The goal of the Benchmarks Workgroup is to develop a review process and a set of assessment criteria (a.k.a. "benchmarks") to guide Network Technical Reviews. The purpose of Technical Reviews is to evaluate each I&M network's ability to manage the data and information generated by network inventory and monitoring activities. The goal is not to score, pass or fail a network; rather, reviews should be a productive evaluation, designed by data managers, that strengthens an individual network and the I&M Program as a whole. This brief presentation will mention the objectives of the upcoming Technical Reviews, outline the goals and purpose of the Benchmarks Workgroup, and provide a snapshot of what the workgroup has accomplished to date. The presentation will end with a project timeline, pointers to current draft material, and a solicitation for feedback.

9:30 Panning for Gold: the quest for abandoned mines in Glacier NP Richard Menicke

American Relief and Recovery Act (ARRA) funding was made available in 2009 to address Abandoned Mining Lands (AML) issues in the NPS. The emphasis was on developing and implementing closure plans for AML sites considered hazardous to humans and wildlife. At Glacier, administrative records document a copper mining boom from 1896 to 1906 with anywhere from 10 to 12 actively mined sites. However, little information exists to pinpoint locations for the mine adits and shafts described in archive records. GIS was used to identify the geologic units for two known mine sites near Josephine Lake and that formation was used as a filter for identifying unknown AML locations while searching NAIP ortho-imagery and Google Earth 3d perspectives for possible sites. Mine tailings provided a "search image" to help locate potential sites, from which X/Y coordinates were acquired and later plugged into GPS to guide ground-based searches deep in Glacier's backcountry. These tools were effective in leading us to some incredible places, where we were amazed at where miners had worked and what they had accomplished back in the day.

9:35 Using 3D Models to Visualize Alternative Futures for Historic Structures Ann Rodman and Carrie Guiles

Accurate and realistic 3D visualizations are an effective communication tool in discussions about the adaptive reuse or removal of historic structures. Decision-makers get to see and discuss the effects of modifying, moving, and removing historic structures before the changes are implemented in the real world. Using SiteBuilder 3D and CommunityViz software, linked to ArcGIS, we've created realistic three-dimensional models of Yellowstone National Park's developed areas. These models are directly linked to resource and infrastructure data in the park's GIS. Because of the complexity of the natural and built environment, creating these 3D scenes is time intensive. Once they are completed though, it is relatively easy to modify them for any number of "what if" scenarios.

9:40 Expert Opinion maps: low hanging fruit Matt Betenson

Expert, specialist opinion maps can provide quick, basic knowledge about a given resource, or threat to that resource. The production sequence of a map of annual brome (e.g., cheatgrass) invasion potential, based upon an existing Inventory & Monitoring Program Vegetation Map combined with an ecologist expert opinion, is used as an example of this process. Products of this type offer smaller NPS units the opportunity capture expert knowledge and apply it as required for specific park projects.

- ◆ **10:00 Concurrent Session 3: What's new in ArcGIS 10** Session Chairs: Tim Clark and Tosia Shall (ESRI)
This is a continuation of the morning keynote presentation. In this extended session, participants will learn more about ArcGIS capabilities for cartography, editing, and GeoDatabases.

- ◆ **10:00 Concurrent Session 4: Digital photo management** Session Chair: Chris Dietrich
This session will touch on a variety of topics related to digital photo management including embedded image file metadata management and software; NPS Focus services, status, and future plans; and OCIO/NISC digital content management efforts and systems.

Metadata and File Properties Tom Richie

This presentation will introduce the concept of metadata and file properties with respect to digital images. It will briefly cover industry image metadata standards, their elements and the storage of that data within the file header. This presentation will also cover the extraction of embedded image metadata for inclusion in image databases, indexing services and SharePoint libraries to facilitate access and discovery.

Focus Image Management Services Greg Creamean

Features and services provided by Focus that will be discussed include registration, authorization, fast track record versus full record, batch uploaded (assisted and user directed), incorporating Focus images into websites, and directed URL search.

Digital Photo Management: NPS Focus Christie McDonald

Current status and future plans of NPS Focus, a system for managing and sharing digital images and documents. Topics to be discussed will include; image management and web services provided, integration with other information systems, federated searching, and future plans including management of embedded metadata.

OCIO/NISC Digital Content Management Tim Cash

The OCIO National Information Systems Center is responsible for providing and coordinating servicewide image and content management systems. This presentation will present an overview of NISC efforts, including the Inside NPS Image Gallery.

- ◆ **10:00 Concurrent session 5: NPSpecies in the NRInfo Portal** Session chair: Alison Loar
This session will include an update of the progress to date of the redesign of NPSpecies for the NRInfo portal, functionality to be added this year, procedural changes necessary after NatureBib is retired, and a preview of the next release scheduled for May.

Wednesday, April 21
Afternoon

◆ **1:00 Concurrent Session 6: GPS Topics**

a. **GeoTagging : How and why to put the where in your photos** (1:00 – 3:00) Session Chair: Brian Diethorn
Geotagging is the process of adding geographical identification metadata to digital images. This session will provide a comprehensive explanation of what that means, what you need to do it, how it is done and their application in the National Park Service. We will go through an established NPS process for creating and using geotagged photos as it applies to Facilities Management. This process will involve using a GPS unit, a digital camera, GPS-PhotoLink software and ArcGIS. Once the exercise is completed Rick Bobbit, CEO of GeoSpatial Experts and Creator of GPS-PhotoLink will demo the upcoming release of GPS-PhotoLink 5.0.

b. NPS Survey Monumentation and Geodetic GPS, or, "not your father's GPS equipment" (3:15 – 5:00) Tim Smith

This session will comprise three components. The first will be an introduction to why survey monumentation is important to the NPS mission, information on the latest standardized data model, and proposed data stewardship for NPS survey monumentation data. The second will be a presentation of a current geodetic monumentation survey project in the Northeast coastal parks in support of sea-level rise science. The last will be an introduction to geodetic GPS survey equipment and a brief overview of field techniques.

◆ **1:00 Concurrent Session 7: Using data for park management decisions** Session Chairs: Roland Duhaime and Bill Slocumb

NER Enterprise GIS: Delivery of Spatial and Tabular Data for Resource Management Bill Slocumb and Roland Duhaime

In an effort to provide resource managers with accurate and current data, Northeast Region cooperators have developed complimentary modes of GIS data delivery. Each environment allows users to access map and associated tabular data in an easy to use interface without installing sophisticated software, e.g. ArcGIS Desktop. In order to utilize either system, an Internet connection is required. In addition to Internet connectivity, one delivery mode requires only web browser software and the other uses a small plug-in associated with Google Earth. Due to each interface's intuitiveness, no user training is required. Applications vary in complexity based on end-user specifications and data needs. Application development includes an ArcGIS Server application allowing field ecologists to display current vegetation characteristics and the location of non-native species. The results and accompanying reports may also be printed. Another application allows Google to display temporal data or a location with multiple observations in a 3D environment.

Ranger Case Incident Reporting Tools in Denali National Park and Preserve Joel Cusick

This presentation outlines the methods, automation and workflow procedures that Denali National Park and Preserve (DENA) uses in the gathering and managing data associated with incident reporting by the Visitor Protection Rangers. In use since 2009, these simple approaches based on Garmin GPS, digital cameras and strict directory structure and naming conventions allow for adding a spatial component to Case Incident reports to improve communication and operational effectiveness by gathering accurate information, and then managing it in a way that makes it accessible and understandable. Training handout example will be provided.

NPScape: Overview of Data Processing and Available Products Peter Budde, Brent Frakes, Lisa Nelson, Bill Monahan

The NPScape project took a consistent, systematic approach to a number of high-priority vital signs that have been identified by most National Park Service Inventory and Monitoring (I&M) Networks; landscape dynamics and adjacent landuse change. The project has been designed and implemented to provide information on the status and trends of park natural resources at broad regional and ecosystem scales. Resulting NPScape data, products, analyses, tools, and procedures cumulatively identify, evaluate, and report a suite of information-rich measures for park units served by the I&M Program. Broad landscape dynamics measures and their respective calculated metrics focus on environmental drivers, ecosystem-level attributes, and the conservation context of NPS units. Together, these measures can inform park decisions, and help to identify potential threats to park resources and opportunities for conservation.

All of the analyses for the NPScape project relied on existing nationwide datasets that were available from a variety of agencies or researchers. While the NPScape tools and procedures described here and throughout the project documentation were created to harness the information content of available nationwide datasets they were developed in such a way that they have a much greater scope of applicability. The presentation will focus on the project approach and products resulting from the effort.

Technical Solutions to Visual Resource Management Issues: The Challenges Faced by the NPS Suzanne Gucciardo

One goal of this conference is to share questions with the NPS information management community as we face technological changes in concert with the potential for dramatic environmental change. This presentation will open the "Pandora's Box" of issues around NPS management of visual resources. Unprecedented numbers of threats to scenery and visitor experience are occurring due to energy and mineral development, telecommunication networks, urban growth, ecosystem change and internal management decisions. The need for standard tools and practices will be demonstrated by using examples drawn from the evolving experiences of the Lewis and Clark National Historic Trail and other NPS areas in responding to threats to visual resources. Methods and guidelines developed by other federal agencies will be summarized as a means of starting the conversation among the NPS technological community. There is

no easy or “one-size fits all” solution for managing visual resources in the wide diversity of NPS areas, but a standard set of tools that provide defensible information on which to make management decisions and to establish policies is needed.

The Role of Decision Support Systems in Natural Resource Management: Overview of the Ecosystem Management Decision Support (EMDS) Framework Kevin James

Adaptive planning is central to natural resource management. However, the processes in designing and conducting adaptive management can be overwhelming. A logic-based approach with spatial analysis provides the needed clarity to bring together multiple datasets and spatial scales under a single management plan. Over the years, decision support systems have been applied to natural resource management with varied success. Ecosystem Management Decision Support (EMDS) is an application framework that combines tabular data, priority setting, scenario planning and spatial analysis into a single decision support system. This application framework succeeds in being transparent in operation, modular in development and flexible to the planning process. Ultimately a GIS-based reporting tool, EMDS contains many aspects that appeal to a broad audience ranging from GIS specialist and scientist to park planner and the general public.

Spatial Analysis of the Interaction between Saguaros and Buffelgrass Becky MacEwan

To better understand saguaros, buffelgrass, and climate, I have mapped current saguaro distributions and compared them to historic data; assessed the vulnerability of saguaros to direct competition with invasive grasses by evaluating the distribution of past and current populations; and evaluated the use of aerial imagery in mapping buffelgrass and saguaros throughout the park. This will be used to develop predictive models for abundance and distribution, identify areas most prone to desert wildfires, and target sites for direct management and mitigation.

GeoSpatial Data in Facilities Management Brian Diethorn, Shawn Wignall

This presentation will cover the current state of affairs in the Facilities Management GIS (FMGIS) program area as well of the future of GIS data in the Facilities Management Software System (FMSS). Current projects such as Park Trails Mobile Condition Assessment, Enterprise Building data collection, the NPMAP Facilities Management application, Climate Change and its impact on facilities and integrating FMGIS images with FMSS will be discussed.

1:00 Tech open house

Laptop computers with wireless Internet and VPN intranet access will be set up for:

1. User feedback on the NRInfo Portal. IRMA staff need your opinions on how the portal works for you, including navigation, search tools, and overall functionality. Stop by and use the portal, and provide your feedback to user analysts. This is an opportunity for you to directly influence the direction and design of the portal.
2. General tech support and questions. Technical support on a variety of topics will be available on a walk-in basis, or you can sign up ahead of time. Participating WASO staff, along with their expertise, include: Simon Kingston (Access, SQL Server); Alison Loar (NPSpecies); Fagan Johnson (websites); Kathy Dratch (SharePoint); Stephani Shupbach and Mara Kali (GIS)

4:15 NRInfo Portal : References Session Chair : Brent Frakes

This session will walk through the user interface and associated functions that will be in the May, 2010 release of the NRInfo Portal (Release 8). This includes the ability to create and edit records, and upload associated content.

6:30 Tools and technology swap meet

An opportunity to meet with co-workers, ask questions, demonstrate what you’ve developed, and follow up on topics presented at the conference. ESRI staff will be present for GIS-specific help; bring your laptop, flash drives, and ideas.

Thursday, April 22
Morning

8:05 Stewardship science and the future ecology of information Gary Machlis (WASO)

The NPS is embarked on a transformative advance of its science activities. This keynote presentation will first briefly describe the scope and significance of NPS stewardship science, and the 10 strategic goals guiding the NPS Science Initiative. The role of information in this transformative change is essential. An alternative view regarding the future ecology of information for the NPS (from cloud computing to visualization design to public cartography and more) will be presented.

Show-and-Tell Sessions

9:15 A Coordinate transformation wizard for MS Access Simon Kingston

The National Park Service's Natural Resource GIS Program (NRGIS) developed the NRGIS Coordinate Transformation Wizard MS Access Add-in as a Microsoft Access add-in (.mda) file for MS Access versions 2003 and 2007. The NRGIS Coordinate Transformation Wizard can be installed and registered using MS Access. Once installed, the NRGIS Coordinate Transformation Wizard becomes a part of MS Access and can transform coordinate data in MS Access tables from one coordinate system and datum to another with input from the user.

9:20 Index your network share drive Tom Richie

Regardless of how well-documented your directory structure is or how strictly your file naming convention is, there will be a time when you say, "I thought I put it here right here." So how do you find your documents? Index Server programmatically indexes the contents of all documents on your network share and makes that content searchable as if it were Google. Old technology, well documented, fast and efficient. If you can't find it with Index Server it ain't there.

9:25 Publishing your report in the NRR, NRTR, and NRDS series Fagan Johnson

Publishing reports in the NRR, NRTR, and/or NRDS series can seem like a daunting task, but it can be very easy. This presentation will outline the basic procedures for submitting a report you want to be published.

9:30 The role of GIS services in Canyonlands v. San Juan County, Utah Jordan Hoaglund

The IMR Geographic Resources Program provided U.S. Attorneys from DOJ with GIS support before and during the Salt Creek/Canyonlands trial. Staff worked closely with U.S. Attorneys during the trial in Salt Lake City to make "on-the-fly" maps and other exhibits to better illustrate evolving legal arguments as the trial progressed. The Geographic Resources program also georeferenced and mosaiced historical aerial photography, cadastral surveys and topographic maps of the Salt Creek area dating from as far back as 1914, which was incorporated into an ArcReader application for rapid display during trial proceedings.

9:35 Saguaro National Park's exotics geodatabase Becky MacEwan

Design and use of the park's exotic plant management geodatabase

9:40 Archival cataloging and long-term storage of Inventory and Monitoring program records in the Intermountain Region Helen Thomas, Kristen Beaupre, Debbie Angell

The Sonoran Desert (SODN) and Northern Colorado Plateau (NCPN) Inventory and Monitoring (I&M) networks have teamed up with the Intermountain Region Museum Services Program (MSP) to develop a methodology for archival cataloging and long-term storage of individual network program and project records at the Western Archeological and Conservation Center (WACC) in Tucson, Arizona. WACC is a newly constructed state-of-the-art museum collections storage facility that provides climate-controlled storage conditions and a professional archives staff, and it meets all NPS museum standards. A Memorandum of Understanding (MOU) has been established between the MSP and each of the networks that defines the standards, terms, and conditions under which the MSP will curate records for the networks, e.g., individual networks will prepare their respective records for archiving; the MSP archives staff will then perform archival processing and cataloging of the records, as well as generate finding aids to ensure archived records are discoverable. Each of the networks has developed documentation describing their respective archiving strategies, guidelines, and procedures. It is hoped that this collaborative effort can serve as a model for other I&M networks to follow for ensuring the long-term preservation of and access to their network program and project records.

◆ **10:00 Concurrent Session 8: Web mapping** Session Chair: Nate Irwin

This session will cover web mapping work that is being done across the NPS.

Web delivery of biological inventory and vegetation monitoring data for the NER Eastern Rivers and Mountains Network Bill Slocumb (North Carolina State University)

A data rich application that goes beyond biological inventories and base cartographic data has been developed for the I&M Eastern Rivers and Mountains Network. The robustness of the application is found in custom queries that relate to vegetation monitoring data sets. Working in cooperation with the ERMN data manager, plant ecologist, and NER I&M Program Manager, a series of data layers and queries were developed from the underlying database tables. The data and queries were then made accessible through a Web browser mapping application, ArcGIS Server. The richness of the underlying database required data to be searchable by topic. Queries include: locating non-native species by common or Latin name, locating invasive species by common or Latin name, searching by tree damage description, and a general search of all documented species by name. In addition, several conditions were represented thematically: year of plot visitation, tree regeneration under deer browse, stand structure, and plot vegetation domain. Finally, query results may be printed in map and tabular format. The application was presented at the ERMN three year review to park superintendents, park resource management, and regional personnel. Requests for the inclusion of additional data and query development have been discussed.

Intermountain Region GIS Program Update Nancy Shock

The IMR Geographic Resources Program is currently in the design phase of developing a region wide Enterprise GIS. The goal is to leverage ESRI's SDE technology to provide access to the most current geospatial data available for all 91 parks in the region. Data managers in the parks can make edits to their geospatial data on their own Park SDE stored on an IMR Server. This allows other NPS GIS users to have read-only access to that updated data by connecting into the Park's SDE. Tying it all together will be internal web-based maps, pointing to the Park's SDE, as well as NPScene and Lands boundary data, thereby bringing the most current data from multiple sources into a single viewing platform. This will allow non-GIS users to have instant access to the same data available to GIS users in the Parks and other NPS programs.

Land Resources Division online mapping applications Roger Johnson (Land Resources Division)

Are you an expert finding the information you need using the online tools that the Land Resources Division makes available to all NPS employees? When you need to see a copy of a deed or enabling legislation do you think LandsNet? Do you have TractsNet bookmarked so you can quickly view tract and boundary data? Can you tell your fellow employees where to go to download maps that are the "official record" of the lands within your parks boundary? Even if you answered yes to all these questions come to this session to find out about the web map service that Lands is developing to improve the access and availability to the geospatial data sets they create and the legal documents that are the foundation on which this data is built.

Geospatial functions in IRMA: extreme mash-ups (just to prove it can be done!) Lisa Nelson and David Hollema (NRPC GIS)

The new IRMA Portal provides geospatial functions, including spatially-enabled searching of Reference and Species data and generalized visualization of Reference data locations. These capabilities are essentially mash-ups of spatial and non-spatial information. In this session, we will discuss the technologies and development practices used to create these functions. Also, plans for technical collaboration with NPMMap and other mapping architectures will be covered.

Utilizing the NPMMap Web Mapping Framework in your GIS project

Nate Irwin (RISD)

The Resource Information Services Division has spent the last couple of years building out the NPMMap web mapping framework. This framework aims to meet the web mapping needs of NPS parks, regions and programs while bringing disparate datasets together in easy-to-use, spatially-focused interfaces. But what exactly does this mean to you? How can you utilize the framework in your GIS project? This presentation will show both what NPMMap is capable of and how NPS staff can get started publishing their data to the framework.

◆ **10:00 Concurrent Session 9: Management of cultural resource information** Session Chair: Deidre McCarthy

This session will explore the use of GIS to help manage cultural resource data at parks and regional levels, as well as explore the newly adopted cultural resource spatial data standards. The session will examine the use of GIS and GPS to help manage and steward cultural resources, as well as their associated spatial data throughout all levels of NPS management, including a park, a region and at the Cultural Resource Program level. Beginning with the use of GIS and GPS tools to reconstruct a landscape at a battlefield park, David Astle will report on one of the Southeast Regional Office's recent projects to work with Chickamauga National Military Park to georeference historic maps and compare current landuse to historic. Jill Halchin will follow with a presentation reporting on how the Southeast Archaeological Center has used GIS to integrate their large collection of archaeological reports with existing NPS database information, using geography as a linking mechanism. Deidre McCarthy will close the session with a discussion of the recently adopted cultural resource spatial data transfer standards, how they can be applied and what this may mean for parks, regions and programs who collect or use cultural resource data.

Utilization of GIS to facilitate the restoration of Chickamauga National Military Park as it appeared in 1863 David Astle
Building a nationwide archaeological GIS Jill Halchin (Southeast Archaeological Center)
National Park Service Cultural Resources Spatial Data Transfer Standards Deidre McCarthy

Thursday, April 22
Afternoon

◆ **1:00 Concurrent Session 10: Reference management** Session Chair: Brent Frakes

This session will cover several of the NPS systems available for documenting and finding information, as well as standards being developed that will ensure seamless data exchange and federated searching among these systems. Discussion at the end of the session will focus on how end-users use the systems and access the information, either directly via a user interface, or other means such as web services.

NPS Bibliographic Metadata Exchange Standard (BMES) & Bibliographic Metadata Application Profile (BibMAP) Amalin Ferguson

This session will provide a brief overview of the proposed enterprise standard and recommended application profile, including purpose for the standard, potential benefits, who will be affected, as well as key aspects of the standard and components of the application profile. The session will wrap up with a list of proposed enterprise initiatives ('Beyond NPS-BibMAP') to address critical metadata and information asset management issues.

NPS Focus Digital Library & Research Station Chris Dietrich

This presentation will provide a brief overview of: NPS Focus scope, the different 'moving parts' constituting NPS Focus, various ways for users and systems to interface with NPS Focus, issues, current projects, and future plans.

The Technical Information Center - From paper to microfilm to electronic Carol Simpson

The Technical Information Center (TIC) is the central repository for NPS reports and drawings. As the oldest and largest NPS information system, TIC offers access to bibliographic records and related images through eTIC (etic.nps.gov). TIC staff generates records for materials and creates an electronic file for ready access by NPS employees. TIC is implementing a robust integrated document and records management system.

The Reference Application Brent Frakes

The Reference Application, accessible via the NRInfo Portal (nrinfo.nps.gov) merges together records formerly managed in the NPS Data Store and NatureBib. While the user interface will be designed to be as flexible and user-oriented as possible, many end users (with within and external to NPS) will want to access data directly in customized applications on their own websites.

A park perspective Kim Hastings

Park users are interested in not only creating and retrieving records via a user interface, but also using data within park-specific applications or sharing with partners. This presentation will prompt discussion on the specific requirements or ideas parks have in applying reference information.

◆ **1:00 Concurrent Session 11: GIS modeling** Session Chair: Mark Christiano

During this session there will be presentations on a variety of NPS GIS modeling projects. The presenters will show how GIS has been used to model large complex datasets. These models aid park managers in understanding difficult management decisions such as how climate change will affect parks.

Often times GIS is seen simply as a mapping tool, however the real power of GIS lies with its ability to model complex scenarios. In this session we will see several examples of how GIS is used to tackle different problems in the park service. Jennifer Boehnert will show how GIS is being used by the National Center for Atmospheric Research to examine climate change impacts. She will also discuss the new GIS portal which will distribute these models. Roland Duhaime will demonstrate how Google Earth and Google SketchUp can be used to model information in 3D. Rachel Hehre has been working to create historic topographic models of several coastal national parks. These models can be used to examine the long term elevation and volumetric changes of the beach and dune systems. Mark Christiano will show how GIS has been used to model the effect of sea level rise and storm surge at Gateway and how this data has been integrated into the general management plan planning process.

- **GIS Program at the National Center for Atmospheric Research** Jennifer Boehnert
- **Using Google Earth and Google SketchUp to Model in 3D** Roland Duhaime
- **Development of Historical Topographic Models of the Beach/Dune System in Northeast Coastal Parks** Rachel Hehre
- **Holding back the flood! Modeling the effects of climate change at Gateway NRA** Mark Christiano

◆ **2:45 Concurrent Session 12: Panel Discussion among EPMT, GIS, and Data Managers** Session Chair: Nancy Shock

National representatives from the I&M Networks, Parks, Fire, GIS Programs, and EPMT Liaisons will all be in Fort Collins the week of the conference, which presents us with a unique opportunity to discuss our data needs in a face to face environment.

All of our respective programs include a major emphasis on delivering useful information to our parks. To date, the delivery of that information has been largely an independent effort among programs resulting in information that is accessed from different locations, often in different formats, making it inefficient for parks to gain a comprehensive view of the collective efforts. There is a need for cooperation to establish the basis for an effort that should dramatically improve our capability to report and interpret the information from our respective programs in a more comprehensive and interdisciplinary context. This should in turn enhance the ability for parks to access and use the information provided for management and interpretation of our park's resources.

◆ **2:45 Concurrent Session 13: Enterprise GIS (EGIS)** Session Chair: Allen Sparks

This session will describe the NPS Enterprise GIS program and present the status and progress on several related initiatives. Allen Sparks will begin the session by describing the major objectives of the EGIS Program, current status of EGIS initiatives, services currently provided, lessons learned, current best practices, and plans for the future. Bill Slocumb will report on an EGIS implementation used to support resource management and research in the Northeast Region. Cynthia Wanshura will present a Fire History data standard and geodatabase implementation model for the *Interagency Wildland Fire Geodatabase Design Project*. Peter Lindstrom will provide a presentation on multiuser geodatabases and geodatabase replication.

- **NPS Enterprise GIS – current status and lessons learned** Allen Sparks
- **Enterprise architecture for delivering of spatial and tabular data and associated documents to managers and field personnel** Bill Slocumb
- **Where's the fire? The development of an interagency fire history geodatabase standard** Cynthia Wanshura
- **Multiuser geodatabases and replication: join the party** Peter Lindstrom

Multiuser geodatabases are the latest addition to the geodatabase family, and replication is one of the more important new features they enable. Replication involves maintaining replicas of a geodatabase on multiple servers with periodic synchronization. This may become a key technology for making spatial data available to more users at a higher speed, facilitating data sharing between parks and offices, and overcoming bandwidth limitations in a way that is compatible with our agency's organization and culture.