

# Inventory and Monitoring Division

I&M NEWSLETTER, Summer 2014

National Park Service  
U.S. Department of the Interior



## Network News

### Arctic Network

#### A Collaborative Approach to Yellow-billed Loon Monitoring

Last year, two Alaska teenagers interviewed Dr. Angela Matz from the U.S. Fish and Wildlife Service (USFWS) about Yellow-billed Loons monitoring in Alaska's northern parks. Youth videographers, Sam Tocktoo of Shishmaref and Sam Bernitz of Anchorage traveled in a float plane to Bering Land Bridge National Preserve and filmed the loons and the story of the science behind long-term monitoring of the species in Alaska. Their videos will help the NPS, USFWS, Bureau of Land Management, and Wildlife Conservation Society bring awareness to the conservation challenges facing Yellow-billed Loons in Alaska. Watch the video Tocktoo helped produce at <http://youtube/EbRmNLWNvAc>. For more information about NPS monitoring of this species visit <http://science.nature.nps.gov/im/units/arcn/vitalsign.cfm?vsid=81>.

To learn more about the species visit [http://www.fws.gov/alaska/fisheries/endangered/pdf/ybl\\_factsheet.pdf](http://www.fws.gov/alaska/fisheries/endangered/pdf/ybl_factsheet.pdf)

#### Looking Closer at Lichens: New insights into an Alaskan lichen

Peter Nelson (Oregon State University/University of Maine-Fort Kent) noticed an unfamiliar lichen species collected in Gates of the Arctic National Park and Preserve last year. Although the species had already been described, a key characteristic was overlooked by the authors who described it—namely, that it hosts both green algae and colonies of cyanobacteria. While this may not seem like much to a non-lichenologist, it would be analogous to describing an animal and not noticing some key appendage, such a tail. It turned out that this species, *Fuscopannaria viridescens*, is the only member of its speciose genus (>40 spp. in North America) with both green algae and cyanobacteria. You can learn more about this lichen by referring to:

Nelson, P. R. and T. Wheeler. 2013. Cephalodia found of *Fuscopannaria viridescens*. *The Lichenologist* 45(5):694-696.

### Southwest Alaska Network

#### Lichen It

Bruce McCune (Oregon State University) and other lichenologists will be in Lake Clark National Park and Preserve for ten days of lichen inventories in mid-July (with integral help of park personnel). The inventory work in Katmai last summer already produced its first manuscript—accepted in *The Bryologist*, “A new corticolous species of *Rinodina* (Physciaceae) and two interesting range extensions for species collected from Katmai National Park, Alaska.”

ALL IMAGES COURTESY OF KEN WRIGHT



## Out Wading in the Water

The aquatic monitoring crew (with park personnel support) worked on Naknek and Brooks lakes in late June (in Katmai National Park and Preserve) and downloaded the Lake Brooks vertical temperature array (it had gone missing for the last month). The crew moved to Lake Clark National Park and Preserve for the next several weeks to continue monitoring.

DAN YOUNG, WRD/LACL FISHERIES BIOLOGIST



Biological technicians, Evan Booher and Jeff Nelson get set up to take a discharge reading on the little Kijik River (one of the most productive sockeye salmon streams in the park) in Lake Clark NPP with the Acoustic Doppler Current Profiler.

## Near-shore Crew Flex their Mussels

The field crew returned from Kenai Fjords at the end of June. Despite the inclement weather, the team got most of the monitoring accomplished. The team noted a large recruitment event of blue mussels (small mussels coating most surfaces across all sites). The Katmai National Park and Preserve coastal near-shore trip departs from Homer July 8<sup>th</sup> for a ten-day trip (NPS, USGS, contractors, and volunteers are all involved). The monitoring crew will also be joined by the Katmai Superintendent, Diane Chung, for a few days.

## Enhanced Salt Marsh Modeling

On October 29, 2012, Hurricane Sandy hit the east coast of the United States, battering coastal towns with heavy winds and a storm surge of up to 14 feet in some areas. More than 23,000 people were displaced from their homes, and critical infrastructure such as transportation and electricity was permanently damaged. With over \$68 billion in damage, only Hurricane Katrina was more costly in U.S. history.

Three Northeast Coastal and Barrier Network (NCBN) parks were particularly affected by the Hurricane: Assateague Island National Seashore, Gateway National Recreation Area, and Fire Island National Seashore. These coastal parks are exceptionally vulnerable to the effects of storms and sea-level rise because of their low elevation, the frequency of Atlantic hurricanes, the adjacent shallow continental shelf, and because they are located in an observed “hot spot” for sea-level rise in the mid-Atlantic region. Following the hurricane, the NCBN program manager joined a team of regional scientists to determine future inventory, monitoring, and data needs that would provide support in developing mitigation strategies to lessen the impacts of future storms on park natural resources. As a result of Hurricane Sandy funding from Congress, the network is leading an important data collection and modeling effort that will not only help parks better understand specific park resource vulnerabilities to future storms, but will also provide key information to NCBN’s parks for future habitat protection, conservation, and planning.

One of several projects underway focuses on determining the fate of salt marsh habitat within NCBN parks. These globally rare habitats act as important buffer zones to adjacent uplands and developed areas along the Atlantic coast during storms. Managers need to be able to better predict how park salt marshes will change over time in relation to various sea-level rise and climate-change scenarios. How much marsh will be lost and what is the potential for existing marsh to migrate inland?

Although there are numerous sea-level rise modeling efforts designed for parks by different agencies and institutions, they are all only as accurate as the data they use. Elevation data in particular is often typically derived from LiDAR, and although accuracy is fairly good for upland habitats, it has been found to be much less accurate for tidal marsh habitat and therefore, much

less useful for specific, locally based modeling exercises. As part of this project, data from NCBN's long-term salt marsh monitoring program, including vegetation, sediment elevations (SETs), and water-level data, will be used along with marsh digital elevation models (DEMs) and suspended sediment data to be collected over the next two years, for marshes in four parks including: Cape Cod National Seashore, Gateway National Recreation Area, Assateague Island National Seashore, and Fire Island National Seashore. Elevation data will be collected using real-time kinematic global positioning systems (RTK GPS) at 20-meter intervals and DEMs will be created for each marsh area. These high-resolution DEMs will help us to understand local spatial inundation patterns on the marsh plain under varying sea-level rise and tidal events and to provide managers information on consequences of sea-level rise for these critical park resources. Not only will this project provide more immediate and important data and information for park managers and planners for mitigation planning, it will complement and enhance the data being collected as part of the NCBN vital signs monitoring program.

Real-time kinematic (RTK) GPS equipment set up on a salt marsh at Cape Cod National Seashore (right); and NCBN biologist, Jim Lynch, collecting elevation data at Fire Island National Seashore (below).



NPS/JIM COMISKEY



NPS/JIM COMISKEY

## Soil Elevation Table used to Monitor Sea-level Rise in the Mangrove Forest

From May 27<sup>th</sup> to June 5<sup>th</sup>, the South Florida/Caribbean Network (SFCN) team members Kevin R. T. Whelan, Robert Muxo, Brooke Shamblin, and Pablo Ruiz installed six soil elevation table (SET) benchmarks at two sites in Virgin Island National Park, St. John, Virgin Islands. The SFCN coastal geomorphology vital sign determines the extent of soil accretion or erosion/compaction that occurs on the mangrove forest floor to evaluate whether or not it is keeping up with sea-level rise. Soil monitoring platforms are constructed to allow sampling access, but do not disturb the soil surface (Figure 1).

This soil monitoring program relies on fixed benchmarks (geologically stable; i.e. jack-hammered for 1 minute with less than 1 cm movement, Figure 2) in which a removable sampling arm is attached to establish a fixed sampling location in which to measure relative change in soil elevation (Figure 3).



**Figure 1.** Establishing soil sampling platform.



**Figure 2.** Jack-hammering survey rods into bed rock until geological refusal is obtained.



**Figure 3 (right).** SET sampling arm attached to newly installed benchmark, feldspar accretion plots (white powder material) are visible.

## Comprehensive Survey and Long-term Monitoring of Rocky Mountain National Park's Streams and Rivers

The Rocky Mountain Network (ROMN), in collaboration with Rocky Mountain National Park (ROMO) and several other federal, state, and local partners will begin long-term monitoring of the park's streams and rivers in 2014. There is substantial interest in streams in ROMO because of the park's proximity to Colorado Front Range urban populations, industries and oil development, and the sensitive nature of streams—especially those in alpine, high-elevation watersheds.

The first three years of the effort will involve a large sample of around 50 sites randomly selected from all perennial flowing water in the park. Several indicators will be measured at base flow including water and sediment chemistry, aquatic macroinvertebrate and algal communities, in-channel habitat (i.e., geomorphology, sediment, and stream flow), multiple measures of the riparian corridor, as well as information on both natural and human disturbances. Monitoring will continue at four sites selected by the park as sentinel streams or rivers, with the same base flow measures and additional chemistry-only events on the other key limbs of the hydrograph. We anticipate repeating the large survey every ten years.

Select individual streams, lakes, and entire watersheds in the park have been previously studied by a wide array of federal, state, and university personnel with many important conclusions. In particular, work in the Loch Vale watershed by the USGS has led to the development of critical loads in lakes for nitrogen deposited aerially (largely from sources on the front range). The joint ROMN-ROMO survey will be the first park-wide, statistically valid monitoring. Because it includes a diverse array of responses, it will allow an integrated perspective on stream ecological integrity. Analyses of these data will include bioassessment models scaled to reference conditions and thresholds specific to ROMO's streams.

To help us develop plans and share background knowledge for this effort, the ROMN recently held a stream monitoring workshop among ~25 park managers and resource management staff, NPS scientists from the Water and Air Resources Divisions, agency (USGS,

USFWS, EPA, USFS, and Colorado Department of Public Health), and academic scientists (Colorado University-Boulder and Colorado State University), and networks staff to (1) define/refine park-specific stream ecological integrity monitoring objectives (especially with an eye toward complementing existing research and monitoring efforts), (2) discuss and refine appropriate stream reference conditions, (3) discuss and clarify regulatory issues and concerns (especially among NPS, EPA, and Colorado Department of Public Health), discuss the monitoring survey design, and identify likely annual monitoring (or sentinel) sites. Important outcomes of the workshop included several partnerships to improve the utility and cost-effectiveness of the stream survey including with University of Colorado to study diatoms, EPA to assist with water chemistry analyses, and with the state of Colorado to evaluate data on copper concentrations in the park's east-side streams to help better understand a potential Clean Water Act listing.

From 2007-2010, the ROMN conducted a similar stream survey approach within Glacier National Park. ROMN is preparing a full synthesis report of that effort now. Preliminary analyses indicate that overall, the ecological integrity of the majority of the streams and rivers of Glacier is intact. Important results of that effort also include the discovery of 39, new-to-science diatom species and data on a suite of stream invertebrates that may be threatened by climate change impacts to streams as glaciers in the park recede and disappear.



The field crew prepares to collect samples.

## Web Design Tailored to Engage Target Audiences

The Southeast Alaska Network (SEAN) took advantage of last year's required website redesign effort to better connect with its customers. The first thing SEAN considered in the redesign was our audience. We chose designs to satisfy three distinct customer groups (1) story-oriented people including interpreters, journalists, and the public; (2) managers, planners, budgeters, and other decision makers; (3) scientists including NPS

resource researchers and our academic colleagues throughout the world. Our web design is illustrated in three tabs from our general reports page ([http://science.nature.nps.gov/im/units/sean/0\\_Reports.aspx](http://science.nature.nps.gov/im/units/sean/0_Reports.aspx)).

A good take-home message: organize your web products and provide enough explanation so people on the public Internet can understand the valuable things your network is doing.



**Story-oriented tab (left).** Clean layout, minimal text, white space, and big thumbnails attract the eye. The linked content is straightforward and audience appropriate.



**Management-oriented tab.** For the audience that wants to know what we're doing and why, we designed information with a relevant photo, adequate white space, and concise text. An opening paragraph explains what is on the page so the manager can quickly decide to keep reading or not. Each document has a medium thumbnail to aid in recognition as well as break up the text. Two or three sentences explain the content of each report. While it's more complicated than the story layout, a story customer is also provided with enough explanation to make use of the content.

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The following protocols have been used for SEAN's production monitoring programs. Open a document by clicking on its author. Items marked with » IRMA also have detailed references present in the national NPS IRMA Data Store repository.

SEAN-developed protocols always consist of a monolithic packet containing three items: narrative chapters, standard operating procedures, and appendices. Each protocol is assigned a unique identifier (such as OC-2010.1). This identifier is stamped onto all data content in the program, so individual data records refer to their precise definitions. If any part of a protocol is revised, it is reissued as a new document having a new identifier - which is reflected in subsequently collected data.

### Freshwater Water Quality

Sergeant, C. J., W. F. Johnson, and S. Nagorski. 2013. Freshwater water quality monitoring protocol: Version FQ-2013.1, Southeast Alaska Network. Natural Resource Report NPS/SEAN/NRR-2013/651. National Park Service, Fort Collins, Colorado. » IRMA

Nagorski, S., C. J. Sergeant, W. F. Johnson, and B. J. Moynahan. 2012. Freshwater water quality monitoring protocol: Version FQ-2012.1, Southeast Alaska Network. Natural Resource Report NPS/SEAN/NRR-2012/496. National Park Service, Fort Collins, Colorado. » IRMA

### Kittlitz's Murrelets

Hoekman, S. T., B. J. Moynahan, W. F. Johnson, and C. J. Sergeant. 2013. Glacier Bay National Park and Preserve Kittlitz's murrelet monitoring protocol: Version KM-2012.1. Natural Resource Report

**Science-oriented tab.** This tab includes a long list of citations, which this audience is comfortable with. There's text at the top describing important interpretation considerations. An appropriate photo doesn't add much meaning, but anchors the page and makes the design more attractive. Most of this content is also in Data Store, and IRMA hyperlinks send the reader to the original report. While some NPS scientists may prefer to directly search Data Store, our colleagues outside the firewall benefit from being directed to what SEAN has found to be important (along with a PDF of each), regardless of their level of expertise working with IRMA.

National Capital Region Network

## Interns Monitor American Chestnuts, Forest Vegetation, and Stream Water Quality

This summer, the National Capital Region Network (NCRN) is hosting four undergraduate interns from the University of Maryland, Baltimore County in a variety of monitoring projects. Two students are surveying surviving American chestnut (*Castanea dentate*) trees across the region. The other two are assisting with long-term forest vegetation monitoring and stream water quality monitoring.

These internships contribute to Secretary Jewel's Youth Initiative. A goal of the initiative is to develop the next generation of park stewards and ensure a skilled and diverse future workforce for the Department of the Interior.

NCRN American Chestnut Interns Mike Reidman and Reid Henderson document their first adult American chestnut tree in Rock Creek Park.



## Monitoring Cave Bats Reveals Effects of Deadly Bat Disease

Cumberland Piedmont Network staff and partners conducted biennial monitoring of hibernating bats in six caves at Chickamauga and Chattanooga National Military Park (CHCH), in three caves at Russell Cave National Monument (RUCA), and in five caves at Mammoth Cave National Park (MACA) in January and February 2014. Field personnel were looking for evidence of the effects of white-nose syndrome (WNS)—an emerging fungal disease estimated to have killed over 5.7 million bats in eastern North America since 2006 and confirmed in 23 states and five Canadian Provinces (see <http://www.nature.nps.gov/biology/wns/index.cfm>). Evidence of WNS in bats was observed in all six caves at CHCH, in two of the three caves at RUCA, and in two of the five MACA caves. Of particular concern was bat mortality caused by the disease observed in several caves among all three parks. Changes in bat roost spatial distribution (likely due to WNS) were documented in five network caves. Preliminary analysis of the monitoring data indicates that tri-colored bat numbers declined at 7 of the 13 network caves for which prior data were available. For more information, contact Steve Thomas at (270) 758-2160 or [steven\\_thomas@nps.gov](mailto:steven_thomas@nps.gov).

NPS



Tri-colored bat with signs of white-nose syndrome at Lookout Mountain (TN).

## Changing Times, Changing Places

Monitoring the forces of nature at work in large wilderness landscapes poses some intriguing logistical challenges. At North Coast and Cascades Network (NCCN), home to three federally designated wilderness national parks (Olympic/OLYM, North Cascades/NOCA, and Mount Rainier/MORA), landscape dynamics was selected as the highest-priority vital sign by park staff. The expectation is to monitor landscape-scale processes including avalanches, fires, mass movements, insect defoliation areas, floods, and wind events to better understand the dynamic nature and condition in and around these national parks. Tracking clearings linked to forest management activities and urban and rural development on nearby land is also desired.

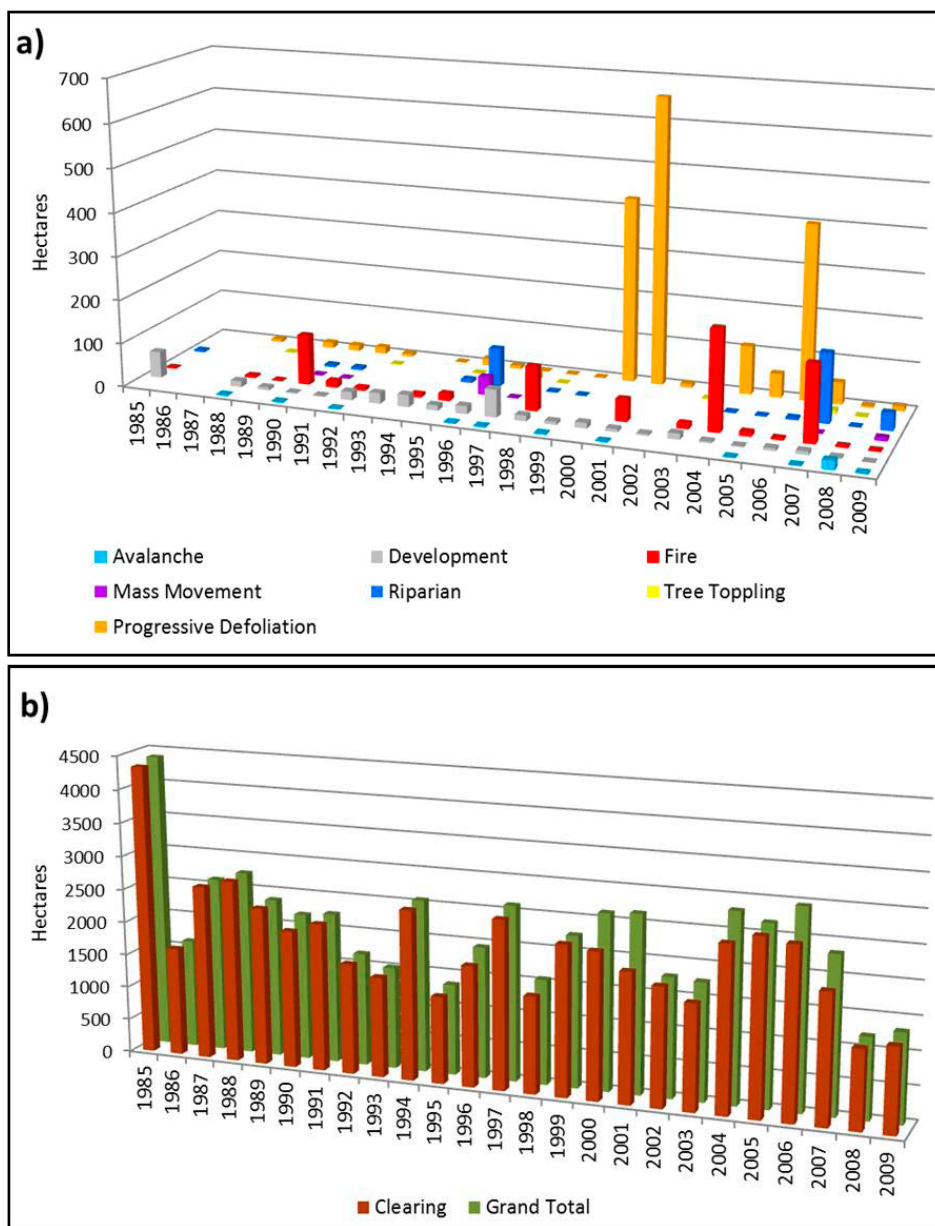
Considering costs, remotely sensed methods are the most practical to apply, however, working with frequent cloud cover and dense coniferous vegetation of the Pacific Northwest meant that significant hurdles had to be overcome. Teaming up with scientists at U.S. Forest Service's Pacific Northwest Research Station and Oregon State University in 2002, the NCCN developed and published a protocol in 2006 that uses Landsat imagery and focuses on attributes of disturbance and recovery, tracking trends in the size, frequency, and severity of significant landscape change events. Although the original objectives included monitoring the cover of snow and ice, alpine vegetation, and seral structure of forests, these were later considered too expensive or impractical.

Implementation began by identifying changes in Landsat images of OLYM, NOCA, and MORA from two sets of years between 2006 and 2008. Through this effort, it became readily apparent that the protocol was too expensive and unwieldy to implement, as illuminated by the NCCN Inventory and Monitoring team of Natalya Antonova, Catherine Thompson [Copass], and Katherine Beirne in a 2010 NPS Natural Resource Technical Report (No. 238).

Meanwhile, NCCN's collaborators at Oregon State University developed and tested a new conceptual approach to detect changes in forest ecosystems. Their new approach, termed LandTrendr, published in *Remote Sensing of Environment* in 2007 and updated in 2010, used analytical methods to track change from a "temporal stack" of Landsat imagery. LandTrendr was

founded on the idea that change is not simply a contrast between conditions at two points in time, but rather a continual process operating at both fast and slow rates on landscapes. As a result, the focus on monitoring landscape change shifted from tracking disturbance events between two images to tracking disturbance trajectories over long periods of time (change recovery).

In 2010, NCCN halted implementation of the original protocol, and Antonova, Copass, and other collaborators began developing a new landscape dynamics protocol based on LandTrendr. A new protocol was approved in 2012 and published in 2013 that provided the network the potential to undertake long-term synthesis reporting of landscape change at a fraction of the cost of the original protocol. Using satellite imagery from 1985 to 2009, NCCN is monitoring the location, timing, extent, and pattern of rapid (or abrupt) landscape changes greater than two acres for a 25-year period within NCCN's seven national and historical parks, including a ten-mile buffer around each park. To date, a 25-year summary assessment of landscape change has been completed and results published in the NPS Natural Resource Data Series for NOCA in 2013 (No. 532) and for MORA in 2014 (No. 637).

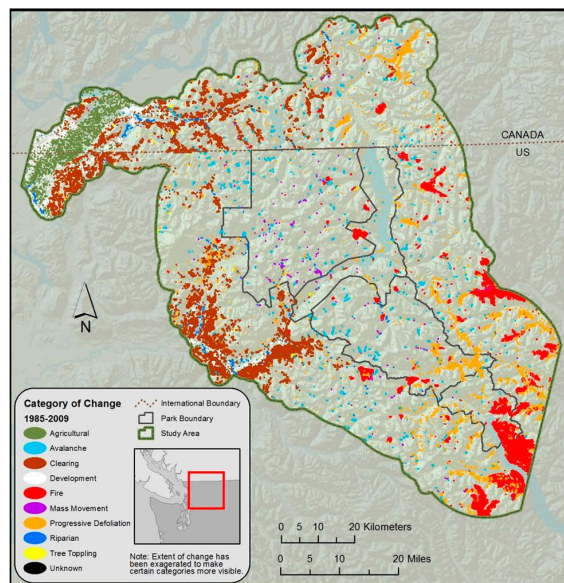


Time series of area disturbed in an ~10-mile buffer outside the Mount Rainier National Park boundary by (a) all change categories except forest clearing and (b) forest clearing as compared to the total area disturbed.

NATALYA ANTONOVA



Slide in North Cascades National Park (above); and map of North Cascades National Park Complex (black line) and ~10-mile buffer area outside the park (green line) showing landscape changes from 1985 to 2009 by change type (right).



## Heartland Network BioBlitz Events...coming to a park near you!

On September 27-28, 2013, a BioBlitz was held at the George Washington Carver National Monument (GWCA) located in Diamond, Missouri. This event was held in conjunction with National Public Lands Day and was a joint effort between the Heartland Inventory and Monitoring Network (HTLN) and the GWCA staff.

A BioBlitz is an event where volunteer scientists, teachers, students, and citizen scientists work together to find and identify as many different species as possible within a designated area using scientific methods and expertise.

The vital signs program only monitors a few of the many species within the ecosystem; many go undiscovered. BioBlitz events and citizen scientists help bridge the gap to provide additional biological information that our parks can use in maintaining and restoring park resources. These events also make science fun for a new generation of citizen scientists and such outreach helps create park stewards for future generations in keeping with the [NPS Call to Action Plan #7](#).

HTLN initiated the planning process by first identifying focus species based on taxa groups previously not found at GWCA. This was accomplished by using the NPS's Integrated Resource Management Applications (IRMA) and NPSpecies programs. Once identified, HTLN recruited and coordinated professional scientists to be team leaders. Press release information was provided to the park for use in recruiting team members (volunteer citizen scientists). Teams were limited to a team leader and nine members.

On the day of the event, GWCA provided the facilities, safety training, and logistical support throughout the event. HTLN handled all scheduling,

registration, coordinating teams, educational activities, and photographing and videography. The photography and videography resulted in the HTLN BioBlitz video that can be seen at: <http://www.youtube.com/watch?v=mzZfXJ75sWw>. HTLN then obtained taxa results from team leaders and wrote the GWCA 2013 BioBlitz data summary report (under review) that includes detailed findings.

Over the 24-hour period, the teams, comprised of 24 volunteers, collected over 1,200 organisms representing 141 unique taxa of which 89 taxa had not previously been reported from the park. An additional 15 park visitors participated in the educational program.

Two new BioBlitz events are already scheduled for 2014: (1) another event at GWCA on September 27, 2014 with focal species being land snails, butterflies, and grasshoppers and their relatives, and (2) Buffalo National River (BUFF) on Oct. 8, 2014 with focal species being water mites. The BUFF BioBlitz is to be held at the George L. Harp Environmental Field Station near Rush, AR.

As a result of the experience from the first event and planning the next two, a "How To" manual on planning and conducting a BioBlitz at a park by park staff is under development and should be out by the first of the year.

For more information on HTLN BioBlitz events, contact info: Theresa Johnson, [theresa\\_weiss-johnson@partner.nps.gov](mailto:theresa_weiss-johnson@partner.nps.gov) or Jan Hinsey, [jan\\_hinsey@nps.gov](mailto:jan_hinsey@nps.gov).

Dr. Kip Heth from Missouri Southern State University (Joplin) and team members processing aquatic insects collected from Williams Pond.



NPS

### New Study by I&M and the Climate Change Response Program Describes Climate Change in National Parks

In a newly published article, [Climate Exposure of U.S. National Parks in a New Era of Change](#), Bill Monahan and Nick Fisichelli studied climate data from the last 10-30 years as compared to the historical range of variability from 1901 to 2012. They analyzed 289 I&M parks, including areas within 30 kilometers surrounding the parks to provide a landscape context. They found that temperatures are now at the high end of the range of temperatures measured since 1901. This is true across several temperature measurements, including annual average temperature, winter months average temperature, and summer months average temperature. The data also point to changes in precipitation patterns over time. These findings are consistent with previous research by the NPS, as well as other national and international reports, including the recently released [National Climate Assessment](#).

*PLOS ONE* selected the NPS article to lead a new collection of papers on responding to climate change, following publication of a recent paper by James Hansen, [Assessing Dangerous Climate Change: Required Reductions of Carbon Emissions to Protect Young People, Future Generations and Nature](#). Click [here](#) to see the complete collection of papers.

From an I&M perspective, the study was conducted in coordination with NPScape and with the objective of providing a value added update to the climate inventory. Efforts are underway to produce two-page resource briefs summarizing findings for each of the 289 I&M parks included in the original study. While the plan was to release these at the time of publication, an unexpectedly fast publication timeline was set by *PLOS ONE* that prevented us from coordinating the release. Nevertheless, the resource briefs will play an important role in helping communicate and translate the work to individual parks. Once finalized, the resource briefs will be posted to IRMA, and I&M networks will receive assistance from the Support Office to post them on their websites via widgets customized for particular parks.

### Using IRMA's Data Store to Preserve Institutional Knowledge

What happens to the institutional knowledge of employees who transfer or retire? When an employee moves on, that person's body of work, including research and collected data, could be lost if not safely stored for future access. Data Store (<https://irma.nps.gov/App/Portal/Home>) is the perfect solution, and our sister agency, the U.S. Fish and Wildlife Service (USFWS) has put that idea to work.

Data Store is the NPS-wide centralized repository for documents, publications, and data sets that are related to NPS natural and cultural resources. In 2010, the co-located USFWS staff requested that the IRMA development team in Ft. Collins modify Data Store so that it could become the central repository for the USFWS Inventory & Monitoring Program. Service Catalog (ServCat), the USFWS version of Data Store, was launched in 2011 and has many enthusiastic users. An article appeared in the current issue of USFWS' Refuge Update that told the story of using ServCat to preserve legacy data of employees who transfer or retire ([http://www.fws.gov/refuges/RefugeUpdate/JulyAug\\_2014/servcat.html](http://www.fws.gov/refuges/RefugeUpdate/JulyAug_2014/servcat.html)).

The ServCat article describes how the research conducted by James Maragos, an expert in coral reef ecosystems, was preserved. His research represents baseline data of the conditions of coral reef ecosystems the first time they were seen by human eyes. By entering his information into ServCat, biologists will be able to compare the reef conditions they observe to the baseline data today or 20 years from now. That type of baseline information is vital to the study of reefs in relation to human impact, coral bleaching, and climate change.

Many IRMA users are focused on getting their legacy data into IRMA and may not have considered using it to prevent loss of data as employees move. With the surge of baby boomers retiring, IRMA is a great tool to preserve valuable information about a specific park, region, or natural/cultural resource issue to preserve research findings for use in the future.

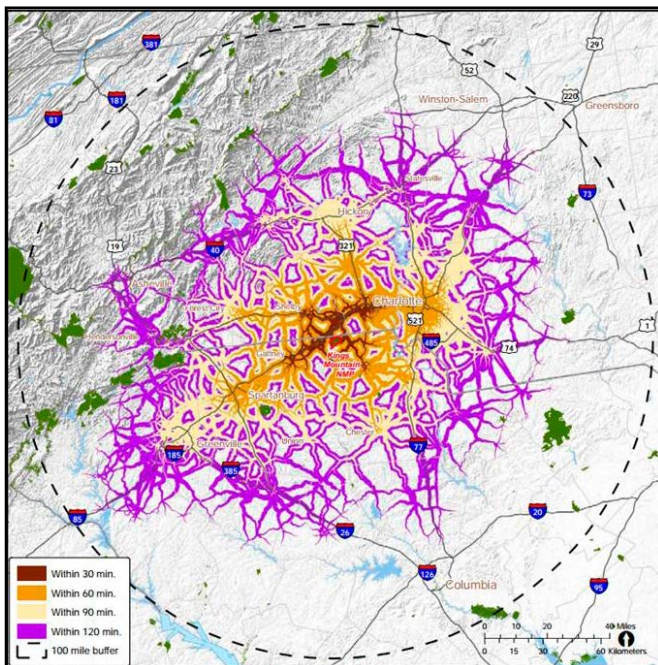
## Revised Travel Time Cost Surface Model Now Available

Brent Frakes has recently revised a Travel Time Cost Surface Model (TTCSM) and presented a webinar on Wednesday, July 23 to describe it.

This model is designed to estimate travel time in national park units using readily available geospatial layers such as roads, trails, and stream networks; digital elevation models; and land cover data. Potential uses of this model include:

1. Stratifying monitoring sample designs by overall accessibility
2. Optimizing field work through route planning
3. Understanding accessibility to and within a park (e.g., travel-shed)

The webinar was recorded and posted in the webinar folder on the [I&M SharePoint site](#).



The map above is an example output of the travel time cost surface model to help understand visitation potential by local communities. This example is Kings Mountain NMP and defines access by 30-, 60-, 90-, and 120-minute travel areas. Within each travel access area, current population status by age and race, and other trends are considered.

## I&M Webinar Series

The monthly I&M webinar series continues, with the following presentations lined up:

### Wednesday, August 20: Report from the Achievement and Accountability Workgroup

The Achievement and Accountability Workgroup (AAW) will roll out proposed changes to the annual accomplishments report (AAR) including the new checklist (see following AAW update). This webinar is the first step in soliciting feedback from networks on the proposed procedures.

Webinars in this series generally take place the third Wednesday of each month, from 11:00 to Noon Mountain Time. Webinar recordings and associated materials are available on the [NRSS SharePoint site](#); click on [Inventory & Monitoring, Webinars, Recorded Webinars](#).

Click [here](#) to register for the series. Register once and you'll be set for the whole series.

## Data Management Google Site

As a complement to the [Ecology Google site](#), a new Google site has been launched for [data management topics](#).

The site should be fairly intuitive to use, but some basic instructions are [here](#).

The question has come up of when to use the listservs and when to use a Google site. Here's one approach to consider:

- Use the *Google sites* when you want start up, contribute to, or follow a discussion. This is a real strength of Google sites—it's a good place to encourage conversations.
- Use the *listservs* when you want to send out broad announcements (e.g., plotter to give away, IRMA updates) and for communication that is more one-way as opposed to two-way.

A drawback to the Google site is that you have to remember to go there to see if there's new content. We suggest you try subscribing to page changes (see the basic instructions via the link, above), that way you will receive an email when new content is posted.

This is a new tool for data management, and while it holds lots of promise, whether it develops into something valuable and worth maintaining will depend on the kind of use it gets. Give it a try and see how it turns out. Many thanks to Fagan Johnson for setting up the site and getting things rolling.

## Safety Corner

*Kirsten Gallo, I&M Program Chief*

I'm six weeks in to my new position as Chief. Believe it or not, the thing I've been thinking about the most is safety. Seems I'm reminded every day of the dangers our crews face while working in the field. If you read *Inside NPS*, we've had a visitor or two die nearly every day lately. Falls. Drowning. Lightning strikes. Exposure. I was on leave last week attending funeral services of a friend who didn't make it off a mountain alive. Although events like these make me mindful of the risks inherent in the work we do and the importance of safety, my commitment to safety doesn't stem from fear that someone will get hurt. It's more fundamental than that. I genuinely care about your wellbeing. Working for the NPS and I&M should be the adventure of a lifetime and that adventure starts with safety and wellness.

I&M spends more time working in the field than any other park or program in the NPS and we do a wide variety of work. At CHDN, one of our smaller networks, crews spend nearly 12,000 hours in the field a year. That's equivalent to six people working in the field full time all the time. Multiply that times 32, and we have a small army of people out and about in our parks. In addition to having safety procedures in place for doing field work in remote areas in inclement weather, we have procedures for diving/snorkeling; caving; using helicopters, airplanes, and air boats; working in all kinds of water; electrofishing; working with diseased animals; laboratory procedures; responding to hurricanes, tornadoes, and floods; and avoiding everything from unexploded ordnance to prairie dog plague. Cumulatively that's a lot of exposure and a lot of risk.

I'd like to use this newsletter as one forum for talking about safety in an endeavor to foster a culture of safety. Specifically, I'd like to be able to share ideas of what networks are doing to make sure our staff are safe and to share lessons learned. To that end, I'll be requesting networks send in info on safety plans and practices, near hits (or misses) or other things you think might be relevant to other networks. We can also use it to discuss new initiatives, such as the Director's safety day held back in June or the new national safety strategy. I'll start with an example from my own former network, CHDN.

In May, one of our crew members had a kidney stone while working in the field. I've never had a kidney stone, but I understand they can be extraordinarily painful. The crew was working less than a mile from a road, and we requested assistance in getting her out so she wouldn't have to hike while enduring excruciating pain. Even though we'd given the park a map with our location, we'd checked in with dispatch prior to going in the field and told them who we were and where we would be working, and we gave them our GPS coordinates when we requested assistance, the park law enforcement had a difficult time finding us. An evacuation that should have taken no more than an hour ended up taking more than six hours. First, the park confused us with another team working in the park and was searching for us in the wrong part of the park. Then the person looking for us couldn't operate a GPS unit or navigate using a map and compass (no joke). The UTV got stuck and they had to send out another. Finally the park called in a drone from a nearby military base to find us.

Although CHDN has had safety plans and procedures in place since 2010, this incident was the first actual test of them. When developing the plan, I'd collected search and rescue, back country, and emergency SOPs from all network parks, but I never sat down with the parks and asked how we could best help them help us when need arose. We're rectifying that now and meeting with each park to make sure we understand what their dispatch and emergency procedures are and what information they need from us and in what format. For example, the network could be providing UTM locations when parks staff are accustomed to lat/long coordinates. In one of our parks, emergency calls should be made to the county, who organizes emergency responses, and not the park. CHDN is now providing land navigation and GPS unit training for park staff and we've updated our communication procedures to include park staff working on weekends and holidays. The big lesson for me in this experience is that it's not safe to assume that parks have their emergency procedures nailed, or that our (I&M) safety procedures alone are sufficient to keep our co-workers safe. When the s\*\*t hits the fan, we're in the hands of rescue staff. It's a good idea to get to know them.

## Announcements: Staff Changes

We bid farewell to **Patrick Flaherty**, the long-standing data manager of the Appalachian Highlands Network (APHN). The APHN data manager position will be filled by **Brian Witcher**, data manager at Southern Florida/Caribbean Network (SFCN). The data management position at SFCN is currently vacant.

**Missy Powell** recently left the Chihuahuan Desert Network (CHDN) and **Kirsten Gallo** left the network manager position to take on the I&M Program Chief position. **Michael Bozek** is acting CHDN program manager.

The Southern Colorado Plateau Network (SCPN) recently said farewell to **Alison Snyder** and **Melissa Dyer**. The SCPN data management position is currently vacant.

The Southeast Coast Network (SECN) has filled three positions: **Pete Mockus** is the network's new water quality technician, **Lisa Cowart** is the new coastal ecologist, and **Jason Gardner** will be joining the network on August 24<sup>th</sup> as the coastal technician.

**Geoff Sanders** is currently the acting program manager for the Mid-Atlantic Network (MIDN).

**Adam Throckmorton**, Heartland Network (HTLN) exotic plant management team (EPMT) crew lead, left the HTLN/EPMT this past summer. The position is vacant with plans to be refilled pending board of directors and Midwest Region position management review board approvals.

The Northern Colorado Plateau Network (NCPN) recently hired **Bonnie Campbell** as the new data management assistant.

In the Northern Great Plains Network (NGPN), **Isabel Ashton** and **Sara Wakimayah** both left the network this past spring. Isabel was the network's plant ecologist, and Sara was an assistant data manager. Both positions are pending approval. Sara has since joined the San Francisco Bay Area Network (SFAN) as data manager.

The Klamath Network (KLMN) recently filled the data manager position; **Allison Snyder**, formerly of the SCPN, joined the network in June. **Dr. Daniel Sarr**, network program manager, left his position in April to join the USGS, and the position is currently vacant.

The Pacific Island Network (PACN) recently filled an aquatic biological science technician position. **Anne Farahi** joined the network in July. Vacancy

announcements for the KLMN and PACN program manager positions closed in early June. Certs have been received.

**Chuck Lindsay**, physical scientist for the Southwest Alaska Network (SWAN), resigned and the announcement to replace him will be posted soon.

The Mojave Network (MOJN) has recently filled two data management positions. In May, **Ryan Hodge** joined the network as the data management assistant. Ryan was previously working as a data manager for Northeast EPMT. Also, **Mark Lehman** has accepted the position of MOJN data manager and begins in his new post at the end of August.

The Upper Columbia Basin Network (UCBN) has filled its data manager position. **Kirk Sherrill**, who previously worked as a GIS specialist in Fort Collins, has accepted the data manager position for UCBN.

### A Profile of Bill Monahan



Bill Monahan has been with I&M in the NRSS Fort Collins office since March 2010 when he hired on as a landscape ecologist and project leader for NPScape. His work is primarily focused on supporting I&M networks and parks with

landscape-scale monitoring and analysis of landscape dynamics, climate, and phenology.

Bill received his Ph.D. in Integrative Biology from the University of California in 2007 and worked for the National Audubon Society before joining I&M. He has conducted ecological and evolutionary research on a diverse range of topics, including the history of Sudden Oak Death disease and its cascading effects on birds, responses of plants and animals to past and future climate change, ring speciation in the *Ensatina* salamander complex, and microevolution in introduced populations of the house sparrow.

## Workgroup Updates

### I&M Inventory Workgroup (IMIWG)

Since early March 2014, an eight-member Inventories Workgroup (IMIWG) has met regularly to develop recommendations for completing the remaining three natural resource inventories. Two subgroups have been established; one to address vegetation resource inventories (VRI), the other to address both the soils resource inventory (SRI) and geology resource inventory (GRI). In addition to holding weekly meetings, the IMIWG has conducted interviews with all three inventory coordinators, solicited input from regional I&M program managers, network program managers, and parks, and have briefed members of the I&M leadership on the groups' progress twice. A draft inventory completion strategy has been developed and is currently undergoing additional modifications based on reviewer feedback. Topics to be covered in the final report include (1) current inventory status, (2) inventory challenges, (3) estimates for inventory completion costs and timelines, and (4) recommendations for completing the remaining inventories. A final report is planned to be delivered to I&M leadership by the end of July or early August.

### Excellence in Science Committee

The three workgroups comprising the Excellence in Science Committee have finalized the scope of their respective workgroups and refined their objectives, completed outlines of the documents and recommendations that will be made from them, and have started drafting numerous chapters of these respective documents. Work has been in conjunction with the Communications Committee and the Accountability Committee to minimize overlap between committees while insuring the coverage of all relevant issues that need to be addressed by the committees that were created out of the I&M survey results.

The Stellar Science in the National Park Service Workgroup is drafting a "best practices guide" that provides an overview that describes what excellent scientists do and what excellent science means. It is put in the context of the NPS mission and specific needs of park resource managers and the highest standards of professionalism. The Integrating Science into National Parks Workgroup is currently working to elucidate natural resource decision-making processes used by park resource managers and evaluating roadblocks to the use of science. Their task is to develop ways to effectively get science integrated into management

decisions, building from previous work within the NPS and other agencies. The Developing Excellent Scientists and Staff Workgroup is reviewing the distribution of professional positions program-wide within I&M, with the intent of developing training strategies and opportunities necessary to attract, develop, and retain excellent scientists and technicians in the program.

### Achievement and Accountability Workgroup

The Achievement and Accountability Workgroup (AAW) consists of one representative from each region along with Kirsten Gallo and Marianne Tucker. Marianne and Lisa Garrett are the co-leaders.

The three objectives of the AAW are to:

- provide a better forum for networks to document and share their achievements;
- provide a clear and consistent means of understanding what is expected of a successful I&M network;
- provide suggestions and examples of "best practices" for networks to share.

The goal is to improve all activities conducted by networks by stating guidelines and standards summarized in a checklist. The AAW started by developing a checklist for networks to use to make sure they have met the increasing number of responsibilities they currently have, and they came up with eight main categories:

1. inventories
2. vital signs monitoring
3. data management
4. reporting
5. integration of findings into management
6. fiscal responsibility
7. leveraging resources
8. safety

There are 26 accomplishment tasks covered within those eight categories. For each of the 26 items, the network program manager will rate their network on how well they have accomplished the task over the past year. This rating will not result in any punitive action, but rather it is a structured way for the program managers to reflect

on each of the areas for which they are responsible, and assess their achievement as they prepare their annual administrative report. The checklist is optional this year, but it will be mandatory for FY15.

Next, the AAW incorporated this checklist into the annual accomplishment report and work plan (AARWP) guidance for the current fiscal year. The administrative report itself had not been substantially updated for several years, so this was done first, and then the checklist was incorporated. Although the checklist will be optional in FY14, program managers are encouraged to use it so they remember accomplishments for all of the 26 areas on the checklist as they prepare their annual administrative report.

The draft AAW product is revised guidance for the FY14-FY15 AARWP that incorporates the annual checklist. It is currently being reviewed by regional program managers through July. After their feedback is incorporated the document will be open for IMD-wide review and feedback in August; the monthly I&M webinar on August 20 will present the new FY14-FY15 AARWP guidance and checklist.

## Communications Workgroup

The Communications workgroup consists of two subgroups: one is focused on communicating monitoring information to scientists and includes a discussion of reporting, peer review, and the publication series; the other is focused on using monitoring information in education and outreach activities. The Communicating Science Workgroup is developing recommendations for reporting, peer review, and the publication series for the I&M Leadership Team (IMLT). The IMLT will determine whether their recommendations will be released as guidance or best practices (or something else) and how to seek input from networks. The Education and Outreach Workgroup has developed a concept paper and is planning a meeting in concert with the National Association for Interpretation annual meeting in Denver November 18-22.

### Announcement: Training Opportunity

In response to feedback in the survey on the need to increase technical skill and capacity in the networks, IMD is hosting a statistical workshop called *Modelling Patterns and Dynamics of Species Occurrence Workshop*. The classes will be taught by Dr. Darryl MacKenzie of New Zealand. Click [here](#) for a preview of the agenda.

IMD will pay for the course; participants will pay for their own travel and accommodations. The exact venues in Asheville and Denver will be announced after we have a rough idea of number of participants. Participation is limited to 20 per class, but a larger class can be arranged at additional cost.

#### Class Dates:

Asheville, NC — November 3-7

Denver, CO — November 17-21

If you're interested in attending, please contact your regional program manager or Marianne Tucker. If space permits, we'll open the course to park and regional staff.

Additional training courses will be scheduled in FY15 and beyond, related to R programming and analysis of water quality and quantity data. If you have a topic you think would be useful to a number of networks, please suggest it to **Michael Bozek**, the lead of the I&M Excellence in Science Committee.