Mojave Desert Network
Inventory & Monitoring Program

The Oasis

"The idea of wilderness needs no defense, it only needs defenders."
—Edward Abbey

Fall 2015

ClimateAnalyzer.org Now Available to the MOJN Parks:

Quick, Easy Access to Park-Specific Climate Information

Climateanalyzer.org is a simple and convenient resource for visualizing climate data across the Mojave Desert Network (MOJN). The website compiles data collected by National Park Service, National Weather Service, Natural Resources Conservation Service, and United States Geological Survey monitoring stations within the parks and from their surrounding vicinities. While most of the stations were installed within the past decade, a few stations have data sets covering 100 years or more. The data are updated every 24 hours, with the latest measurements available on the website within a couple of weeks. In addition, MOJN I&M recently supported the addition of weather stations in and near all MOJN parks, making it possible for park staff to quickly and easily generate graphs of long term climate variations at individual stations near or within their park.

To access the data, navigate to the website and click the Mojave Desert National Parks button to see a map of the network with icons representing different types and sources of data. A majority of the parks in MOJN have multiple data sets available. One can choose from temperature, precipitation, snowpack, stream discharge, and other types of data from the drop-down menus. In the event that data are needed for further analysis, the website provides these data in both graph and table form.

An example of one of the many kinds of graphs that you can produce is Graph 1 (page 3) from the Furnace Creek COOP (Cooperative Observer Program of the National Weather Service) station. It shows temperature deviations from the 1971-2000 average for each year since data collection began in 1962. The graph shows that average annual temperatures during the past decade have been slightly warmer than they

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INVASIVE PLANT GUIDE

for National Parks in the Mojave Desert Network

Coming Soon to the MOJN Parks!

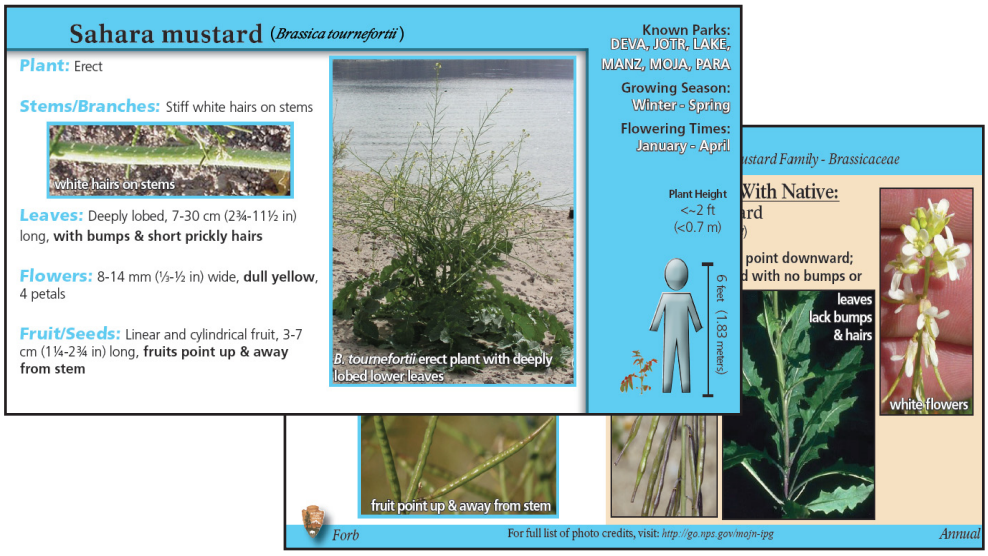
The Invasive Plant Guide is now complete!

Over the next several months, each park will be receiving a number of printed, laminated, bound copies of this guide. MOJN I&M is working with parks to determine options for hosting brief explanation (roll-out) sessions about the guide and how to use it. MOJN I&M welcomes and encourages all park staff to be involved in these presentations, and will be providing more information to park staff as plans become finalized.

Do you want non-vegetation division staff to be able to recognize and identify key targeted species that you are trying to control, manage, or keep an eye on? This guide uses simple, non-technical language that can help your park staff quickly and easily identify an invasive plant encroaching on park lands - no plant knowledge needed!

Are you looking for new ways that your park can provide visitors with Citizen Science opportunities? This guide could be displayed in visitors centers or made available for check-out to volunteers and visitors who are interested in recording occurrences of invasive plants within the park!

Is your park planning a BioBlitz for the Centennial Challenge? This guide is an excellent tool to provide volunteers in order to ensure they are collecting accurate data and enjoying themselves at the same time!



Above: Front & back sides of the Sahara mustard plant card. All information for each plant will be contained within a single, double-sided card. Descriptive text and photos create a user-friendly tool to identify non-native plants that can displace native plants, increase the likelihood of wildfires, and change the dynamics of natural plant ecosystems.

Right: Stanley Gloyne of the LAKE Roads & Trails Crew, holding the guide in order to show scale. The guide is small enough to fit inside a back or chest pocket, but large enough to clearly see the text and photos, even in bright sunlight.

The Oasis Recognizes...

Carrie Norman, LAKE Vegetation Biologist!

MOJN I&M would like to thank Carrie Norman for her invaluable assistance on and contribution to the Invasive Plant Guide. Her knowledge and expertise were greatly needed and appreciated in order to create a product that we believe all the MOJN parks will find helpful and easy to use.

Carrie Norman has worked for LAKE since October 2001, first as a member of the Lake Mead Exotic Plant Management Team (EPMT) (while also working for USGS in the off-seasons) until 2003 when she became part of the LAKE Vegetation Division. Just prior to starting her National Park Service career, she received her Bachelor's of Science degree in Biology at Eastern Washington University in 2001.

Currently, Carrie is working on data collection at long-term vegetation plots (which were established back 1979) to gather information on whether climate change will affect the vegetation in the Newberry Mountain Range and if so, when those effects might begin to appear. She also spends her work time doing rare plant surveys and monitoring throughout the park, as well as working with LAKE EPMT to control a variety of invasive species.

In her spare time, Carrie enjoys many hobbies including birding, hiking, backpacking, skiing, snowshoeing, camping, photography, fishing, hunting, ATV riding, bicycle riding, learning new plants, reading, cooking, astronomy, kayaking, and rafting.

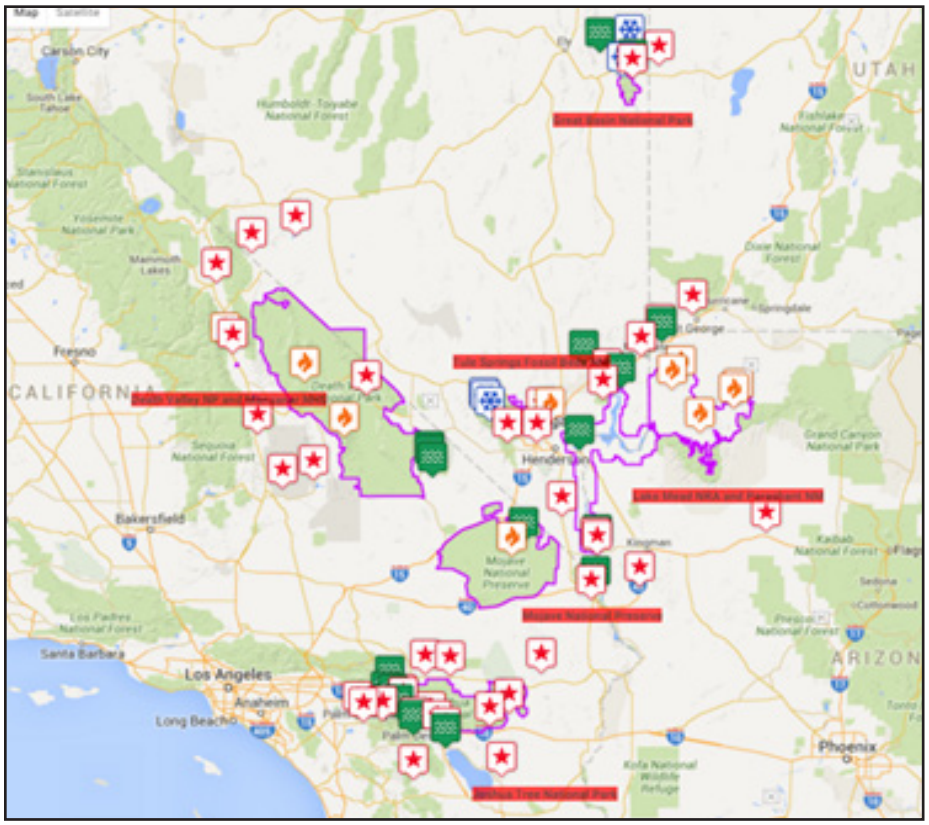
CLIMATEANALYZER.ORG CONTINUED

were 50 years ago.

Graph 2 (below) from the Furnace Creek COOP station shows precipitation for each month of 2015 as a percentage of the 1971-2000 average. The record rainfall that caused extreme damage in Death Valley recently was captured in the data set, as you can see that October precipitation for this year was nearly 1000% of average.

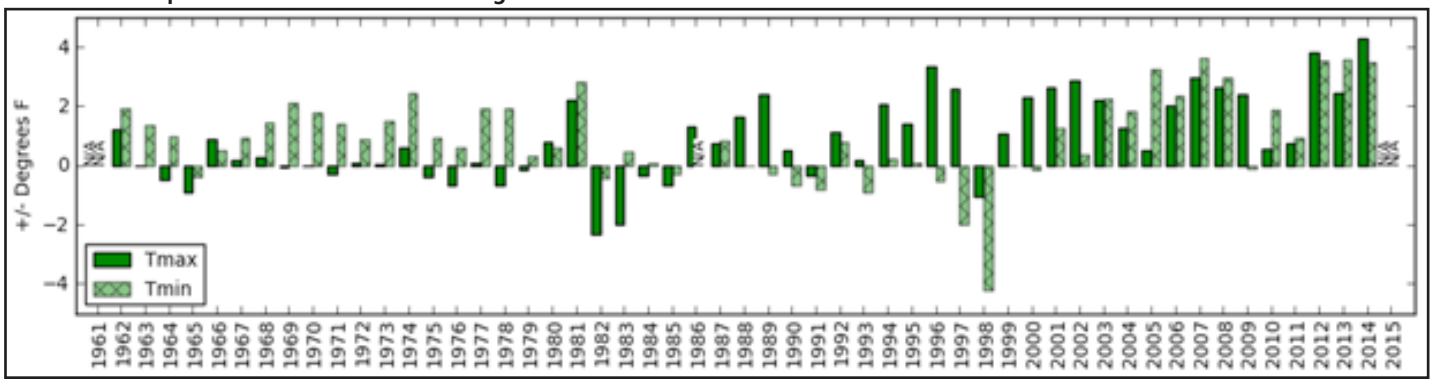
Climateanalyzer.org is maintained by Mike Tercek of Walking Shadow Ecology. The website can be viewed and used by all National Park Service employees and members of the public who are interested in exploring modern and historical climate data across the Mojave Desert Network.

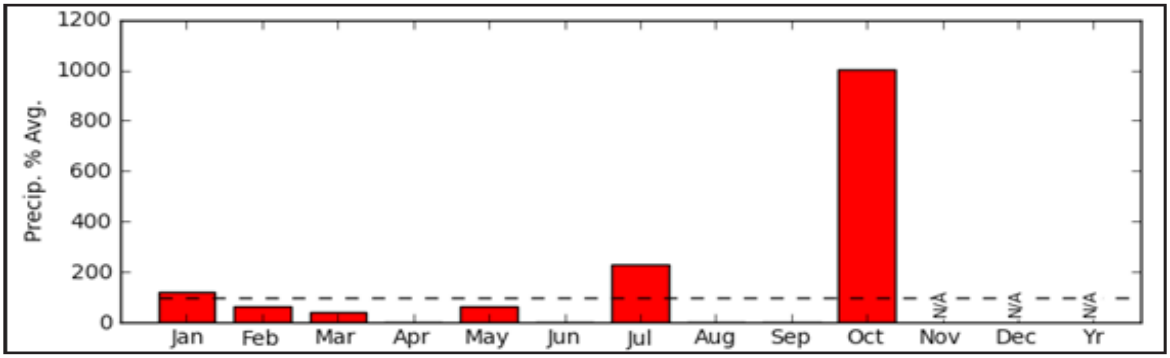
- Jennifer Bailard, MOJN Hydrologic Technician



Above: Mojave Desert Network National Parks map in Climateanalyzer.org

Below: Graph 1. Death Valley CA USC00042319
1961-2015: Departure from 1971 - 2000 Avgs.





Left: Graph 2. Death Valley CA (USC00042319)
2015: Departure from 1971 - 2000 Avgs.

What is the MOJN I&M Program?

The Mojave Desert Network Inventory and Monitoring (I&M) Program is one of 32 networks of parks established under the National Park Service I&M Division to implement long-term ecological monitoring across multiple park units that share relatively similar ecological attributes. Data collected through this program will help inform park resource management decisions.

(click on the hyperlinks to learn more about each park)

Parks within the MOJN I&M:

DEVA: Death Valley National Park
GRBA: Great Basin National Park
JOTR: Joshua Tree National Park
LAKE: Lake Mead National Recreation Area
MANZ: Manzanar National Historic Site
MOJA: Mojave National Preserve
PARA: Grand Canyon-Parashant National Monument
TUSK: Tule Springs Fossil Beds National Monument

The Spotlight is On...

Pacific West Region Inventory & Monitoring Program Manager:

Lisa Garrett

Lisa Garrett began her new position as the Inventory and Monitoring Program Manager for the National Park Service in the Pacific West Region (PWR) in July, and has embraced both its challenges and opportunities with great enthusiasm.

The PWR is one of seven national park regions which group I&M networks into geographically contiguous units. This regional organizational structure was established to supply oversight, and overarching support and guidance to the I&M networks for a wide variety of administrative and technical needs.

Lisa served as the Upper Columbia Basin I&M Network Program Manager from 2003-2012. Lisa then served as the Southeast Region's Division Chief for the Inventory and Monitoring Program prior to starting this position. As the PWR I&M Program Manager, Lisa will lead the development, implementation, and management of the interdisciplinary I&M program for the eight Networks in the Pacific West Region.

Lisa hopes to achieve continued collaboration between I&M Networks and the parks they serve. Her long-term vision is that I&M Networks work seamlessly with the parks so that long-term monitoring data is routinely used to enhance and inform park management decisions. Lisa is strongly committed to her work with the national parks and firmly believes that, with increased habitat fragmentation and impacts from climate change, tracking the status and trends of the condition of natural resources will contribute significantly to the conservation mission of the National Park Service.

Lisa grew up on the east coast and attended West Virginia University where she graduated with a Bachelor's of Science degree in Natural Resource Management. After living in North Carolina and starting a family, she moved to Idaho where she completed her Master's of Science degree in Wildlife Resources at the University of Idaho. Her graduate research was funded by the NPS, as she developed a prioritized ranking system for mammalian research in large western national parks.

Lisa is a mother to three sons and two daughters-in-law. She and her husband Jim have two grandchildren, with another on the way. When not on the job, she enjoys fishing, hunting, scuba diving, and backpacking with her husband, friends, and family.

Staffing Changes: Hail and Farewell

Hail...

Michael Steiner

Michael arrived at MOJN I&M on August 31st, 2015 through an internship with the Geoscientist in the Parks Program. He is originally from Detroit, MI and moved to Las Vegas in 2008 to pursue an undergraduate degree from University of Nevada, Las Vegas (UNLV). He recently completed his M.S. in Geoscience, with a focus on geochemistry, from UNLV. Michael is working directly with Geoff Moret to assist with various water-related protocol efforts. Thus far, he has assisted in processing the GRBA stream discharge record, and has joined in on several site visits to GRBA in order to calibrate water measurement devices and take water quality measurements. He has also enjoyed being involved in fieldwork efforts for Selected Large Springs monitoring at JOTR. Michael's internship with MOJN I&M will continue until the end of the year.

Rachael Fletcher

Rachael joined the MOJN I&M team in November 2015 as part of the International Volunteer-in-Parks Program. Originally from Suffolk, England, she has just graduated from Imperial College London with an M.S. in Geology. Most recently, Rachael has assisted the MOJN hydrology crew with the weir plate installation and repair effort at Blue Point Spring at LAKE. Over the next 9 months, Rachael will continue working with Geoff and the rest of the hydrology team.

Nicole Hupp

In September 2015, Nicole joined the MOJN team as a collaborator at the University of Montana; her role is the Invasive Species Early Detection Protocol Lead.

Nicole is working to create a practical Invasive Species - Early Detection protocol for the MOJN parks, with emphasis on *practical*. This protocol is intended to be a tool that each park can use to address new exotic species before they become a widespread and costly problem. Though the actual writing of this protocol will be conducted by Nicole, she feels it can only be effective with the knowledge and experience of park employees. Nicole plans to work with folks at each of the MOJN parks to understand current efforts, unique challenges, future plans, and resources used for exotic species management. This fall Nicole completed her Master's thesis at the University of Montana. For the past two and a half years she has worked with Ray Callaway studying interactions between plants in alpine and high desert systems. One of the emphases of her research is to understand how foundation species might help exotic plants establish themselves (i.e. get a foothold) in these harsh ecosystems. She's excited to continue studying invaders in this collaboration with MOJN I&M.

and Farewell...

Sarah Wright

Sarah started as an SCA Data Management Intern for the MOJN I&M in December 2014. Prior to joining MOJN, she received a Bachelor's degree in Computer Science from the University of North Carolina at Chapel Hill. She assists Mark Lehman with database development and maintenance along with a variety of other data management needs. Her internship will extend through the end of January 2016.

Ryan Hodge

Ryan started as the MOJN I&M Assistant Data Manager in May of 2014, coming to the desert southwest from his previous position as Data Manager for the Northeast Exotic Plant Management Team. In August 2015, Ryan transferred to the North Coast and Cascades I&M Network to continue work as a Data Management Assistant within the IT Series. In his year with MOJN I&M, Ryan contributed valuable assistance to the MOJN I&M Team, as well as providing his help and technical knowledge for various science communication projects. MOJN I&M wishes him well in his future endeavours.

2015 MOJN I&M Program Updates

	 DEVA	 GRBA	 JOTR	 LAKE	 MANZ	 MOJA	 PARA	 TUSK
Vegetation Classification & Mapping Project	Leadership of this effort coordinated by WASO Vegetation Mapping Program. Progress continues as funding is available.	Vegetation Map and associated products completed in 2012. Products now available on IRMA.	Products now available on IRMA. MOJN I&M and the Vegetation Mapping Inventory staff provided roll-out of JOTR Vegetation Map and associated products December 2015.	Leadership of this effort coordinated by WASO Vegetation Mapping Program. Accuracy Assessment completed in FY15. Efforts continue.	MOJN I&M and the Vegetation Mapping Inventory staff provided roll-out of MANZ Vegetation Map October 2014. Products now available on IRMA.	Leadership of this effort coordinated by WASO Vegetation Mapping Program. Progress continues as funding is available.	Products available on IRMA. PARA's Vegetation Mapping Report was included as part of the Grand Canyon National Park Report.	TBD. Awaiting funds availability from the IMD as it is a new park.
Geologic Resources (Inventory & Mapping) AND Soils Resources (Inventory & Mapping) *Efforts being led by Geologic Resource Division (GRD).*	Geologic Resources effort is currently in progress. Map is now complete, report scheduled for completion in 2016. Soils Inventory and Mapping effort has not been scheduled to date.	Geologic Resources Map complete, report scheduled for completion in 2016. All products will continue to be for internal use only until USGS approval and release. Soils Inventory and Map completed in 2009 and updated in 2013.	Geologic Resources Map complete, report scheduled for completion in 2016. All products will continue to be for internal use only until USGS approval and release. Soils Inventory and Map completed in 2012.	Geologic Resources Map complete, report scheduled for completion in 2017. All products will continue to be for internal use only until USGS approval and release. Soils Inventory and Map in progress, completion expected in 2016.	Geologic Resources Map completed with Sequoia and Kings Canyon National Parks Maps. Soils Inventory and Mapping products completed in 2006.	Geologic Resources Map complete, report scheduled for 2017. All products will continue to be for internal use only until USGS approval and release. Completion of Soils Map and report TBD. Efforts currently in progress.	Geologic Resources scoping and data acquisition efforts are complete. Mapping effort to commence awaits IMD facilitation. Soils Inventory and Map completed in 2009.	Geologic Resources Inventory (GRI) Scoping Meeting occurred July 2015. Determination of what GRI products will be produced remains TBD. Soils Inventory and Mapping TBD. Awaiting funds availability from the IMD as it is a new park.
Invasive Plant Species Early Detection/ Status & Trends Monitoring *Nicole Hupp, University of Montana to lead protocol development.*	Potential site visit by cooperator to meet with park staff Spring 2016.	Potential site visit by cooperator to meet with park staff Spring 2016.	Potential site visit by cooperator to meet with park staff Spring 2016.	Initial site visit by cooperator. Met with park staff and toured sections of park (November 2015).	Potential site visit by cooperator to meet with park staff Spring 2016.	Initial site visit by cooperator. Toured sections of park with MOJN I&M staff (November 2015). Potential site visit by cooperator to meet with park staff Spring 2016.	Potential site visit by cooperator to meet with park staff Spring 2016.	Initial site visit by cooperator. Met with Superintendent and toured sections of park (November 2015).
Integrated Upland Soils & Vegetation Monitoring *Protocol published in IRMA August 2015.*	A total of 35 plots will be established in Blackbrush community between January and April, 2016. Data collection will occur on a three-year cyclical basis after these plots are established.	A total of 35 plots to be established in Sagebrush community in Summer 2017. Data collection will occur on a three-year cyclical basis after these plots are established.	A total of 35 plots are now established in Joshua Tree woodland community and data has been collected (completed April 2015). Data collection will continue on a three-year cyclical basis.	A total of 33 plots have been established in Creosote - White Bursage community and data has been collected. Remaining two plots will be established at a later time due to current safety concerns.	A total of 3 plots have been established in Rabbitbrush community and initial pilot data has been collected. Data collection will continue on a three-year cyclical basis, starting in Spring 2016.	A total of 35 plots were established in Mixed Creosote community and data has been collected (completed December 2015). Data collection will continue on a three-year cyclical basis.	A total of 35 plots to be established in Sagebrush community in Summer 2017. Data collection will occur on a three-year cyclical basis after these plots are established.	TBD. Awaiting funds availability from the IMD as it is a new park.
Riparian Plant Communities Monitoring	The Riparian Plant Communities Monitoring Protocol will be developed by MOJN I&M by drawing from existing I&M protocols that address riparian plant monitoring. Nita Tallent will serve as the Protocol Lead.							

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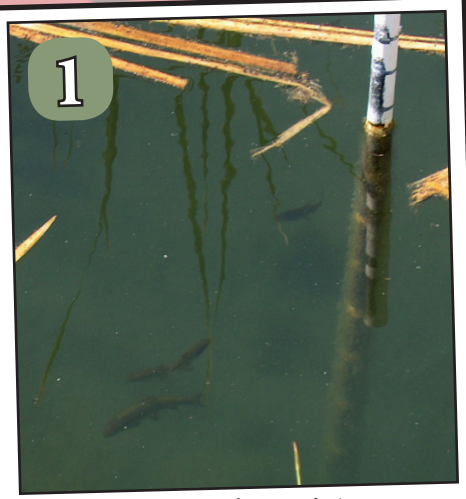
2015 MOJN I&M Program Updates continued

	 DEVA	 GRBA	 JOTR	 LAKE	 MANZ	 MOJA	 PARA	 TUSK
Selected Large Springs Monitoring *Protocol conditionally approved. Discharge, water availability, quality and chemisty, and benthic macroinvertebrates (BMI) are monitored.*	BMI and springsnail samples were collected at Saratoga Spring, Texas Spring, and Mound Spring (located above Scotty's Ranch).	Selected Large Springs monitoring currently not conducted at GRBA.	MOJN I&M continued surface water availability monitoring at 49 Palms Oasis and Smith Water Canyon Springs. Data report on FY14 BMI and surface water availability monitoring at springs published and available here on IRMA.	MOJN I&M completed effort with the USGS, park staff, and NPS WRD to replace the rusted weir plate at Blue Point Spring in November 2015 so that flow monitoring can continue. BMI and springsnail samples were collected at Blue Point Spring.	Selected Large Springs monitoring not conducted at MANZ due to absence of water sources.	MOJN I&M published a report in the NRR series on the use of historic photographs of MC Spring to reconstruct pool stage levels to provide context for this data, click here to access the report. MOJN I&M continues to monitor the pool stage at MC Spring.	BMI samples were collected at Pakoon Spring. PARA is conducting a major restoration/rehabilitation project at Pakoon Spring, and the BMI data will help evaluate the ecological effects of the project.	Selected Large Springs monitoring not conducted at TUSK due to absence of water sources.
Streams & Lakes Monitoring *Protocol published in 2012. Streams & Lakes monitoring occurs only in GRBA.*	Streams & Lakes monitoring is only conducted at GRBA.	Seventh year of Streams & Lakes monitoring completed in September 2015. Data reports for 2009-2010, 2011-2013 and 2014 now published on IRMA (click year to access reports).	Streams & Lakes monitoring is only conducted at GRBA.	Streams & Lakes monitoring is only conducted at GRBA.	Streams & Lakes monitoring is only conducted at GRBA.	Streams & Lakes monitoring is only conducted at GRBA.	Streams & Lakes monitoring is only conducted at GRBA.	Streams & Lakes monitoring is only conducted at GRBA.
Weather & Climate Monitoring *This protocol will be developed by the Central Office. ClimateAnalyzer.org now available for park use. See cover page for more information.*	Weather stations previously installed at Saratoga Springs and Eureka Valley. Installation TBD for a weather station and snow gauge to be installed at Rogers Peak (currently part of a larger NEPA process).	MOJN I&M installed a weather station and snow gauge at Decathon Canyon in September 2015.	Weather station previously installed at Wilson Canyon.	MOJN I&M currently working with NOAA to assume ownership of weather station near Meadview.	Weather station information near MANZ can be found by accessing ClimateAnalyzer.org.	Weather station previously installed at OX Ranch.	Weather station previously installed at Nevershine.	Weather station information near TUSK can be found by accessing ClimateAnalyzer.org.
Desert Springs Monitoring	MOJN I&M participated in the inter-network, collaborative (MOJN, NCPN, SCPN and SWNC [CHDN, SODN, SOPN]) effort to develop a common springs database. The Desert Springs Protocol is still in development, and a draft will be circulated to parks in early 2016.							
Invasive Plant Guide	Completion of the Invasive Plant Guide occurred in November 2015. Park visits for roll-out (distribution and presentation) of product expected in early 2016. See more information about the guide on page 2 of this newsletter.							
Air Quality	PWR Air Resource Division to develop a regional protocol. General information about air quality condition and trends within each national park unit can be found here.							
Landscape Dynamics Protocol	The Landscape Dynamics protocol will be developed by the Central Office. The Fire and Fuels Protocol is expected to be developed as a "module" within the Landscape Dynamics Protocol, and staff from the MOJN I&M will work directly with the Central Office to modify the protocol in order to add specific measures and metrics for each park.							
Paleontological Resources	Efforts to monitor paleontological resources in MOJN I&M parks commenced in FY15. Efforts are being led by Vincent Santucci of the NPS Geologic Resource Division.							
Data Management	Data Management efforts include ongoing clean-up and verification of Springs Inventory data, data entry & quality assessment for Integrated Uplands vegetation monitoring collected in MOJA (Fall 2015) & JOTR (Spring 2015) field seasons, and continuation of database development efforts for the Selected Large Springs and Desert Springs protocols.							
Science Communications	The Oasis (Spring & Fall 2015 issues) now available on the MOJN I&M website. MOJN I&M Network Science Communication Implementation Plan to be developed upon completion of National Inventory & Monitoring Division (IMD) Communications Plan early 2016. MOJN I&M staff to attend Communicating Science Workshop for Natural Resource Professionals by the Alan Alda Center for Communicating Science in 2016.							

Photo Quiz: How Well Do You Know The MOJN Parks?

Test your knowledge about the MOJN parks! Identify which park is shown in the photos below. When you're done, check your answers at the bottom of this page.



Where was this picture taken? Hint: There was a feature article about this spring in the previous issue of The Oasis!

Can you tell where Mark Lehman snapped this photo of these petroglyphs?

This beautiful view is the backdrop for which MOJN park?

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Zoom in for answers to photo quiz: 1. Mc Spring in Mojave Nfres 2. Nampaweap in Grand Canyon NM 3. Manzanar NHS

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