

Southwest Biological Science Center Monthly Update

As a unit of the U.S. Geological Survey (USGS), the mission of the Southwest Biological Science Center (SBSC) is to provide quality scientific information needed to conserve and manage natural and biological resources, with an emphasis on the species and ecosystems of the southwestern United States. The SBSC has two research branches: Terrestrial Dryland Ecology and Rivers Ecosystem Science (which includes the Grand Canyon Monitoring and Research Center (GCMRC)). Both branches conduct research on the biology, ecology, and processes of the Southwest. SBSC has two field stations in Arizona (Flagstaff and Tucson) and one in Moab, Utah.

WELCOME

Below are recent products and activities coming from the SBSC. Underlined names indicate SBSC personnel. If you would like more information on anything in this month's update contact Todd Wojtowicz (twojtowicz@usgs.gov).

IMAGE OF THE MONTH



**The Colorado River flowing through the Grand Canyon, AZ in 2013
(photo credit: Kyrie Fry, USGS)**

Media, Broadcasts, and Films

Jayne Belnap is part of a [National Geographic](#) series called “**Continent 7: Antarctica**”. This series features Antarctica scientists who are working to unravel impacts of human use of the [Dry Valleys](#), and can be seen on the National Geographic Channel. The link to the trailer:

<http://channel.nationalgeographic.com/videos/continent-7-antarctica-trailer/>. Link to “Continent 7: Antarctica” photos: <http://www.nationalgeographic.com.au/tv/continent-7-antarctica/>.

Kirsten Ironside was interviewed by [KNAU, Arizona Public Radio](#) for the show, “**Brain Food**”. The episode is called, “**Brain Food: understanding mountain lion behavior to prevent collisions with cars**”. Link to the episode: <http://knau.org/term/brain-food#stream/0>.

Jeff Lovich’s research on turtles was highlighted in the Kobe Shimbun evening newspaper in [Japan](#). The article is titled, “**Measuring the impact of invasive species on popular culture: a case study based on toy turtles from Japan**”, and refers to research that will be published in the Japanese journal, *Humans and Nature*. The story was featured on the [front page of the newspaper](#), sharing the page with top stories like the Fukushima clean-up. The link to the article: <http://www.kobe-np.co.jp/news/shakai/201611/0009705409.shtml>.

[National Geographic](#) posted a video on their webpage titled, “**At 17 Million Years Old, Grand Canyon Still Has Lessons to Teach**”. The video focuses on the importance of the [Colorado River](#), mostly from the perspective of participants in the [Grand Canyon Youth program](#), a partner of the [Grand Canyon Monitoring and Research Center](#) (GCMRC). [Anya Metcalfe](#) and [Carol Fritzing](#) of the GCMRC are featured in the video. The link to the full video is here: <http://video.nationalgeographic.com/video/short-film-showcase/17-million-years-old-grand-canyon-still-has-lessons-to-teach>. A shorter video is on the Facebook page for National Geographic (<https://www.facebook.com/natgeo/videos/10154132008298951/?pnref=story>).

Public and Partner Outreach Activities

Jayne Belnap will be assisting [undergraduate and graduate students](#) on their research projects while at a field station in [Chile](#).

Seth Munson served as a mentor for two [NASA DEVELOP](#) (<http://develop.larc.nasa.gov>) fall 2016 projects on: 1) assessing landscape vulnerability to [drought](#) and [climate change](#) in national parks of the western U.S., and 2) detecting and monitoring [invasive buffleggrass](#) in the national parks of southern Arizona. The mission of DEVELOP is to integrate NASA Earth observations with society to foster future innovation and cultivate the professionals of tomorrow. The 1st DEVELOP team, consisting of students at [NASA Langley Research Center](#), utilized previous USGS research to understand how shifts in water availability affect the productivity of [sagebrush](#) communities in [Dinosaur National Monument](#), CO/UT: <http://develop.larc.nasa.gov/2016/fall/WesternUSWaterII.html>. The 2nd DEVELOP team, consisting of students at [NASA Jet Propulsion Laboratory](#), expanded on buffleggrass detection methods of USGS to improve the ability of managers to detect and monitor an invasive species that increases [fire risk](#) in the [Sonoran Desert](#): <http://develop.larc.nasa.gov/2016/fall/SouthernArizonaEco.html>. The 2016 NASA DEVELOP projects featured national park partnerships, many of which can be found at: <http://develop.larc.nasa.gov/project-archive.php>.

Presentations, Posters, Lectures, Workshops, and Panels

Bradford, J.B., 2016, **Climate change impacts on sagebrush ecosystems** [presentation]: Sagebrush Conservation Strategy Workshop.

Bradford, J.B., Copeland, S., Munson, S.M., Roybal, C.L., Wood, T.E., and Bradford, J.B., 2016, **Prestoration: using species in restoration that will persist now and into the future** [presentation]: Society for Ecological Restoration – Southwest Chapter Annual Conference.

Copeland, S.M., Bradford, J.B., Butterfield, B.J., Munson, S.M., Pilliod, D.S., and Welty, J.L., 2016, **Spatial and temporal patterns of vegetation treatments in the Southwest: variability and trends with implications for restoration success** [presentation]: Society for Ecological Restoration – Southwest Chapter Annual Conference.

Munson, S.M., Bradford, J.B., Butterfield, B.J., Wood, T.E., and Copeland, S.M., 2016, **Restoration Assessment and Monitoring Program for the Southwest (RAMPS)** [presentation]: Society for Ecological Restoration – Southwest Chapter Annual Conference.

Reed, S.C., 2016, **Dryland responses to anthropogenic change: a biogeochemical perspective** [seminar]: Utah State University.

Sher, A.A., Munson, S.M., Bowman, A., Whitney, R., Aguirre-Wong, F., Jackson, E., and Robinson, R., 2016, **Phenology of insect-pollinated high-altitude plants in Colorado** [presentation]: High Country Lepidopterist Meeting.

Ward, D.L., 2016, **Colorado pikeminnow: forgotten predator of the Lower Colorado River** [poster]: Desert Fishes Council meeting.

Ward, D.L., Vaage, B., Sheehan, K., and Nelson, C., 2016, **Effects of elevated carbon dioxide on fish populations within the Little Colorado River in Grand Canyon** [presentation]: Desert Fishes Council meeting.

Published Papers, Reports, and Data Releases

O'Donnell, R.P., Drost, C.A., and Mock, K.E., 2016, **Cryptic invasion of northern leopard frogs (*Rana pipiens*) across phylogeographic boundaries and a dilemma for conservation of a declining amphibian**: Biological Invasions. Online link: <http://link.springer.com/article/10.1007/s10530-016-1320-1>.

Metcalf, A.N., Kennedy, T.A., and Muehlbauer, J.D., 2016, **Phenology of the adult angel lichen moth (*Cisthene angelus*) in Grand Canyon, USA**: The Southwestern Naturalist, no. 61, v. 3, p. 233-240. Online link: <http://dx.doi.org/10.1894/0038-4909-61.3.233>.

Munson, S.M., and Long, A.L., 2016, **Climate drives shifts in grass reproductive phenology across the western USA**: *New Phytologist*. Online link: <http://onlinelibrary.wiley.com/doi/10.1111/nph.14327/abstract> and <http://dx.doi.org/10.1111/nph.14327>.

Witwicki, D.L., Munson, S.M., and Thoma, D.P., 2016. **Effects of climate and water balance across grasslands of varying C3 and C4 grass cover**: *Ecosphere* 7(11):e01577. 10.1002/ecs2.1577.
Online link: <http://onlinelibrary.wiley.com/doi/10.1002/ecs2.1577/full>.

OTHER NOTABLES

John Bradford led a **climate change**-focused work group at the **Sagebrush** Conservation Strategy Workshop in Denver, Colorado (November 1-3).

Jeff Lovich recently met with **Bureau of Land Management** biologists at his field site to discuss ongoing research on **western pond turtles** and **endangered fish** on BLM land along the **Mojave River**. Attendees included the Fishery Biologist from the Washington, D.C. office, the Associate Deputy State Director of Natural Resources for California, and representatives from field offices in the California Desert District of BLM.

Sasha Reed met with **Utah State University** collaborators about their recently-funded **graduate education program** titled: **Graduate Climate Adaptation Research that Enhances Education and Responsiveness of Science at the Management-Policy Interface**. This **National Science Foundation**-funded project aims to prepare **STEM** graduates for careers that integrate science with **management** and **policy** in order to improve our understanding of and capacity to adapt to a changing **climate**. For more information, please contact Sasha at screed@usgs.gov.

Jayne Belnap is in **Chile** to give two presentations, one at the end of November and one in early December. One talk will be given at **Pontificia Universidad Católica de Chile**, and is titled, “**Ecosystem roles of biological soil crusts**”. The other talk will be at a research field station used by several universities, and that talk is titled, “Effects of **nitrogen deposition** on global ecosystems, with a focus on **forests**”.