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CORE SCIENCE SYSTEMS

John Wesley Powell Center *for Analysis and Synthesis*

Director's Message

The Powell Center has recently hosted three sets of time-sensitive workshops to address pressing policy or management needs. We proudly report that the Monarch Conservation Science Partnership contributed to the development of a National Strategy to Promote the Health of Honey Bees and Other Pollinators (Pollinator Health Task Force, 2015; 1.usa.gov/1HpQhIf); and was featured prominently at the 20th Annual Meeting of the Trilateral Committee for Wildlife and Ecosystem Conservation and Management among Canada, the United States, and Mexico. The Monarch Butterfly group met twice at Powell Center during 12 months to develop robust estimates of extinction risk, regional conservation priorities, priority threats, and specific restoration scenarios aimed at meeting the goal of 225 million monarchs by 2020 set by the Pollinator Task Force. Congratulations to the team of Darius Semmens, Wayne Thogmartin, Jay Diffendorfer (all U.S. Geological Survey), and Laura Lopez-Hoffman (University of Arizona) who recognized the urgency of developing and implementing a plan to protect these iconic North American insects from continuing decline because of habitat loss. We plan to host future meetings of the Tri-national Monarch Conservation Science Partnership when it meets in the United States, and thank the U.S. Geological Survey Ecosystems Mission Area for supporting this important work.

Topics of the other two workshops were "Landscape Intactness for Bureau of Land Management Lands," to develop a robust conceptual model for ecological assessments and "Developing a North American Surveillance Monitoring Program," to plan management strategies protecting salamanders from Batrachochytrium salamandrivorans, a fungus that is fatal to salamanders.

Finally, we are pleased with our new dedicated Powell Center space at the Fort Collins Science Center!

Jill Baron and Marty Goldhaber,
Co-Directors
http://powellcenter.usgs.gov

Featured Working Group

Light Detection and Ranging (lidar)

Light detection and ranging (lidar) is a versatile remote-sensing technology that develops very high resolution topography data. For understanding rivers, lidar is becoming essential to improve disaster preparedness, manage floods and droughts, protect infrastructure, enhance agricultural production, and strengthen decisionmaking capacity at all levels of government.

"Exploiting high-resolution topography for advancing the understanding of mass and energy transfer across landscapes" is headed up by Paola Passalacqua (University of Texas), Patrick Belmont (Utah State University), Dennis Staley (U.S. Geological Survey [USGS]) and Jeff Simley (USGS). The group is advancing the use of lidar as a tool to detect geomorphic changes to river channel networks and near-channel environments. Lidar precisely measures the contour of natural and manmade environments, and has great potential to advance understanding of fine-scale movement of materials, which is critical to understanding and managing Earth surface processes.

The lidar Working Group published an invited paper in Earth Science Reviews using the Minnesota River Basin case study: "Analyzing high resolution topography for advancing the understanding of mass and energy transfer through landscapes: A review." The paper provides clear guidance on how to use high-resolution topography effectively and provides a forward-looking view of how development of software and analytical tools should evolve to make the best use of the data and respond to newly developed technologies.

Many of the group's products are now available and in active use. The "Floodplain Mapper" and "Terrace Extraction Toolbox" are now available on the OpenTopography tool repository (bit.ly/1QMsXfy). The toolbox GeoNet, which is in use in Australia for revising stream regulations, has been translated into Python and integrated with GRASS GIS by Fellow Harish Sangireddy. The new GeoNet is available at bit.ly/1TItiir and bit.ly/1QMsXfy).

Recent Publications

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Powell Fellow

Elise Zipkin

uses hierarchical models to understand and estimate species distributions and abundances. She brought that expertise to the Powell Center, where she was a Fellow from 2012 to 2013 for the Working Group, "Modeling species response to environmental change." Of the six papers produced thus far from this prolific group, Zipkin is lead or co-author on four. She became an Assistant Professor in the Department of Integrative Biology at Michigan State University in 2014. Her current research focuses on the effects of landscape heterogeneity and climate on the demographics of species and communities. Zipkin says, of her collaborators and Working Group experience, that "The Powell Center provided a diverse group of researchers with an opportunity to devote our undivided attention on a specific modeling task. As a result, we made significant progress on developing scalable, integrated population models to answer big questions associated with environmental and climate change, something that would not have been possible without this opportunity."

Powell Center Pulse

Ecological Society of America
2 Symposia from Working Groups
2 Organized Sessions from Working Groups
13 Presentations

25 Countries
48 States repesented by scientists

652 Working Group Participants

488 Citations

66 Publications
23 since last Newsletter

300+ Twitter Followers

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