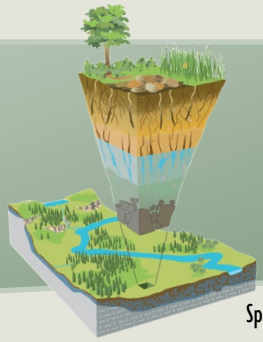
National CZO Program | CZNews

Spring2015



Message from the National Office:

Welcome to the first installment of CZNews, one in an anticipated long line of informative quarterly newsletters that will be provided by the National Office to the Critical Zone community. The intent of the newsletter is to highlight events and activities that have occurred--though at times we will announce future opportunities well in advance through this venue as well as on criticalzone.org. This is a community commodity and we very much encourage anyone from the CZO and greater CZ science community to contact us with news stories, current events, important research results, and opportunities. We will look forward to your input as we forge ahead with the evolving CZO network.

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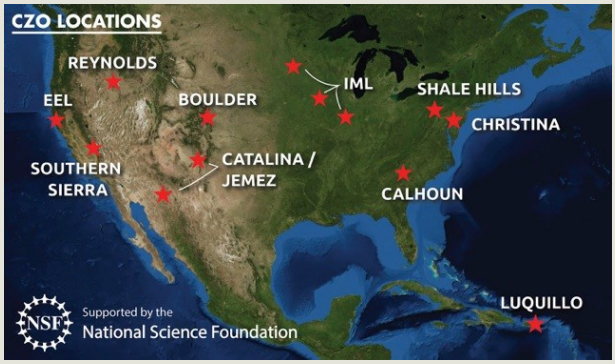

The Critical Zone Observatory (CZO) program was established in 2007 by funding from the National Science Foundation to support three observatories: Susquehanna-Shale Hills Observatory in central Pennsylvania, the Southern Sierra Observatory in California, and the Boulder Creek Observatory in Colorado. In 2009, three additional observatories were added to the program: Luquillo Mountains CZO in eastern Puerto Rico, Christina River Basin CZO in Delaware and eastern Pennsylvania, and the Santa Catalina Mountains & Jemez River Basin CZO in Arizona and New Mexico. Then in 2013 four more were added: Eel River CZO in northern California, Reynolds Creek CZO in Idaho, the Intensively Managed Landscape CZO in Illinois, Iowa and Minnesota, and the Calhoun Forest CZO in northern South Carolina. The expansion of the program prompted the creation of a CZO National Office in 2014 to coordinate cross-site science and education activities. Subsequently, NSF funds were awarded to the national office through the Science Across Virtual Institutes (SAVI) project to develop international collaboration including graduate student and early-career scientist scholarships, training workshops and field schools.

All-Hands Meeting

The Southern Sierra CZO team hosted an All Hands Meeting that met September 21-24, 2014 in Fish Camp, California. Attendees participated in field trips, a poster session and presentations, followed by working groups based on the following four themes: 1) What controls CZ properties and processes? 2) What is the response of CZ structure, stores and fluxes to climate? 3) What is the response of CZ structure, stores and fluxes to land use change? 4) How can understanding of the CZ be used to enhance resiliency and sustainability, and restore ecosystem services? A decision was made to use SAVI workshop funds to support multiple small workshops based on these themes. Working groups submitted short proposals and the following were chosen for funding in 2015 (workshop lead):

- Concentration-discharge relationships to differences in CZ structure and function across the CZO network (Jon Chorover, Catalina/Jemez).
- Fate of P during pedogenesis, microbial diversity and function with depth in soils, and mycorrhizal impacts and influences on above-ground processes (Emma Aronson, Southern Sierra).
- CZO microbial ecology intercomparison with cyberinfrastructure-enabled data synthesis (Aaron Packman, IML).
- Developing the construct of Critical Zone services (Bill McDowell, Luquillo).
- Critical Zone resiliency to disturbance: developing testable hypotheses using common cross-CZO measurements (Diana Karwan, University of Minnesota).

Anyone interested in attending a workshop is encouraged to contact the lead to determine availability.

CZO Spotlight: Jill Marshall

Jill Marshall, National Office

The NSF Earth Sciences Division recently awarded Jill Marshall (University of Oregon), an NSF postdoctoral fellowship for her cross-CZO proposal: Cracking the critical zone: Tree roots in fractures and a proposed mechanistic soil production function. The study's overarching objective is to parameterize and calibrate a soil production function (a geomorphic process law) for forested landscapes based on observations of the mechanics of root-driven bedrock damage and detachment. The lack of a mechanistic bedrock to soil production function has hampered progress on a broad array of problems in critical zone science. This project will enable numerical experiments that explore how the presence and absence of vegetation control surface and near-surface processes and landscape form. Project mentors are Dr. William Dietrich (Director Eel River CZO), UC Berkeley (primary host institution), and Dr. Robert Anderson (Investigator Boulder Creek CZO), University of Colorado. Jill will start research during mid-summer 2015, working at the Eel River, Boulder Creek, and Southern Sierra CZOs where she can take advantage of the three CZO's exposed roots in bedrock fractures, and site-specific differences in climate-driven rock-water availability and rock properties.

AGU 2014 Fall Meeting

Critical Zone Observatories and the National Office had a strong presence at AGU's 2014 Fall Meeting held December 15th to 19th in San Francisco, California. The program had a booth in the Exhibit Hall, an annual breakfast meeting with NSF, as well as over 150 posters and presentations related to critical zone science. For information on CZ presentations featured at AGU, view the agenda available at http://criticalzone.org/national/news/story/czos-at-agu/. The program also engaged the greater community with a Town Hall meeting where ~150 people attended for lunch and beverages. NSF program director Enriqueta Barrera gave a short introduction to the CZOs followed by comments by Tim White (Pennsylvania State University) and Lou Derry (Cornell University) from the new national office. The main activity involved presentations by the following CZO PIs: Shale Hills PI Sue Brantley spoke on Using a Critical Zone Observatory Network to explore the architecture, dynamics and evolution of the Critical Zone; Eel River PI Bill Dietrich spoke on Common-science questions at the CZOs; and, Jemez/Catalina PI Jon Chorover finished with Common measurements across the CZOs. Short presentations by Jerome Gaillardet (Critex) and Jorg Volkel (TERENO) described the development of CZOs in France and Germany, respectively.

International Critical Zone Science

Frontiers in International Critical Zone Science , NSFC

The Multilateral Workshop on the Frontiers in International Critical Zone Science took place from May 21st to May 24th in Beijing held by the National Natural Science Foundation of China (NSFC), National Environmental Research Council (NERC), National Science Foundation (NSF), German Research Foundation (DFG) and National Center for Scientific Research (CNRS). Experts from China, UK, USA, Germany and France discussed research progress and issues related to international Critical Zone Observatories. The funding agencies reached an agreement to fund symposiums and workshops and promote a network of international collaboration. A subset of the Beijing meeting attendees met again in San Francisco prior to the AGU Fall 2014 Meeting. As a result of these meetings, NERC and NSFC signed a statement of intent to address the resiliency of China's ecosystem services with agriculture and urbanization. A call for proposals has been made under 'Using Critical Zone Science to understand sustaining the ecosystem service of soil and water', and selected projects will be funded for a three-year duration. Stay tuned for future development of these collaborations on the international front.