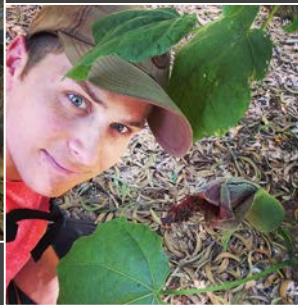

Research Opportunities at USGS for Graduate Students

Eleanour Snow
Laura Corey

www.usgs.gov/gro.at.usgs

The USGS is a federal science agency that provides impartial information on the health of our ecosystems and environment, the natural hazards that threaten us, the natural resources we rely on, the impacts of climate and land-use change, and the core science systems that help us provide timely, relevant, and useable scientific information to inform decision-making.

Natural Hazards
Energy and Minerals
Environmental Health
Core Science Systems (modeling, mapping, data)
Climate and Land Use Change
Ecosystems
Water



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National Science Foundation/USGS Internship Opportunities

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By Field of Study

By NSF Division

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Graduate students have several ways to develop a proposal for the NSF/USGS **GRO @USGS** partnership.

- Find a project by [Field of Study](#), by [NSF Division](#), that is what you want to do, and work with the project lead to develop a proposal together
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Themes



Opportunities by Field of Study



Opportunities by NSF Division



USGS NSF GRIP Opportunity

USGS Center:	National Research Program - Eastern Branch
Project Title:	Understanding Surface Water Availability for the Nation
Project Hypothesis or Objectives:	Daily streamflow information is critical for solving any number of hydrologic problems. If a suitable probability density function (pdf) was identified to represent daily streamflow, one could provide functional linkages between the pdfs of daily streamflow and precipitation toward a probabilistic framework that explains how catchments filter the precipitation signal. This topic has been a fundamental – yet currently unsolved – problem in hydrology. Further, when changes to the landscape, climate, or water use, it is unknown how these changes then affect the behavior of streamflow. The objective of this work is to understand the behavior of streamflow time series and how streamflow behavior changes due to changes in climate, land cover, and water use within the contributing catchment.
Duration:	9-12 months
Internship Location:	Reston, Virginia
Area of Discipline:	Earth Science, Hydrology, Environmental Statistics, Stochastic Hydrology, Physical Sciences
Expected Outcome:	Results of this project will advance our fundamental understanding of the behavior of streamflow and have implications for a number of USGS programs, particularly two research thrusts of the National Water Census. The project will publish at least one paper in the peer-reviewed literature. The intern will receive mentorship, opportunities to broaden their professional network, and exposure to USGS culture, mission and research efforts.
Special skills/training Required:	Completion of a bachelors or masters degree in computer science, earth sciences related discipline (geology, biology, hydrology, etc.), applied mathematics, econometrics or related field. Background in environmental statistics and hydrology preferred. Applicant must be proficient in at least one computer programming language, preferably R.
Duties/Responsibilities:	1. Collection and analysis of daily streamflow obtained from approximately 6,000 streamgages across the Nation.



Today's discussion is organized by Primary Field of Study
But note: much of the science USGS does is interdisciplinary,
so look broadly. (Times approximate)

2:30-2:50

Biology, Ecosystems, Atmospheric Science, Science Education (14)

2:50-3:00

Modeling (8)

3:00-3:20

Geology and Physical Sciences (14)

3:20-3:35

Hydrology/Hydrogeology (12)

3:35-3:40

Engineering and High Performance Computing (2)

3:40-4:00

Open Questions

Biology, Ecosystems, Atmospheres and Science Education



A tale of two coasts: Tidal marsh persistence with changing climate and sea-level rise

Karen Thorne

kthorne@usgs.gov

Western Ecological Research Center

Vallejo CA

Patuxent Wildlife Research Center

Laurel MD

U.S. Department of the Interior
U.S. Geological Survey





Climate-induced changes in phenology in coastal ecosystems

Michelle Staudinger

mstaudinger@usgs.gov

**DOI Northeast Climate Adaptation
Science Center**

Amherst MA



Response of a tidal brackish marsh to global change drivers: An ecosystem level manipulation of warming and elevated carbon dioxide

Glenn Guntenspergen

glenn_guntenspergen@usgs.gov

Patuxent Wildlife Research Center

Laurel MD



Fighting the Tide: Combating Coral Disease and Disappearance Within the Florida Reef Tract Using Models

Dr. Daniel Walsh

dwalsh@usgs.gov

**National Wildlife Health Center
Madison, WI**



*Development of methods distinguishing live and dead cell
DNA for qPCR detection and quantification of pathogen
genes in environmental samples for quantitative microbial
risk assessment*

Carrie Givens

cgivens@usgs.gov

**Michigan-Ohio Water Science Center
Lansing MI**



Long-term trends in forest regeneration across drought and salinity gradients in the northern Gulf Coast

Beth Middleton

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**Wetlands and Aquatic Research Center
Lafayette LA**





Plant and insect invasions and novel host use

Ian Pearce

ipearse@usgs.gov

Fort Collins Science Center

Fort Collins CO



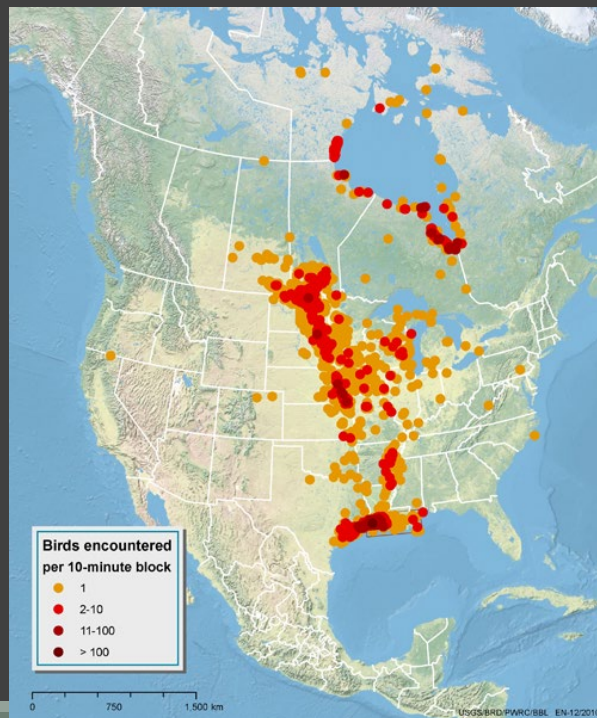
Assessing the role of automated telemetry data and mark-recapture approaches to improve estimates of bird population trends at migration banding stations

Bruce Peterjohn

bpeterjohn@usgs.gov

Patuxent Wildlife Research Center

Laurel MD



Tabitha Graves

tgraves@usgs.gov

**Northern Rocky Mountain Science
Center – West Glacier MT**





Red squirrel responses to climate change in New England's boreal forests

Toni Lyn Morelli

tmorelli@usgs.gov

**Northeast Climate Adaptation Science
Center**

Amherst MA



Developing optimal post-fire restoration strategies to build ecosystem resilience

Stephanie Yelenik

syelenik@usgs.gov

Pacific Island Ecosystem Research Center

Volcano HI





Air quality and energy development in the southwestern US

Sasha Reed

screed@usgs.gov

Southwest Biological

Science Center

Moab UT



Biological Soil Crusts in Bandelier National Monument: An opportunity for Science Education

Sasha Reed

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The evolution of aerosol DNA/RNA extraction methods for aerobiology research projects

Dale Griffin

dgriffin@usgs.gov

St. Petersburg Microbiology

Research Laboratory

St. Petersburg, FL



Modeling Projects

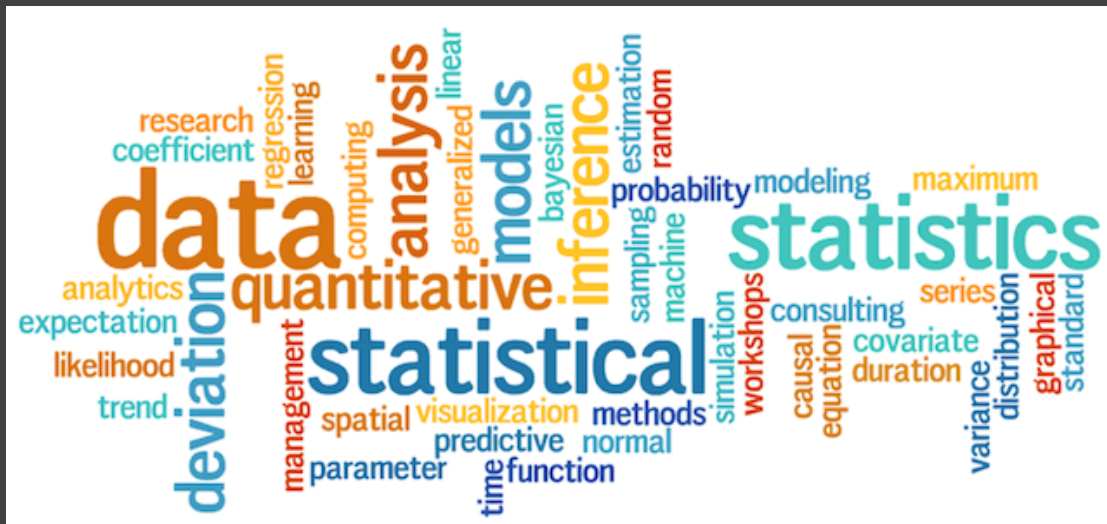
Models of high-dimensional environmental and ecological data

Brian Gray

brgray@usgs.gov

Upper Midwest Environmental
Science Center

La Crosse WI



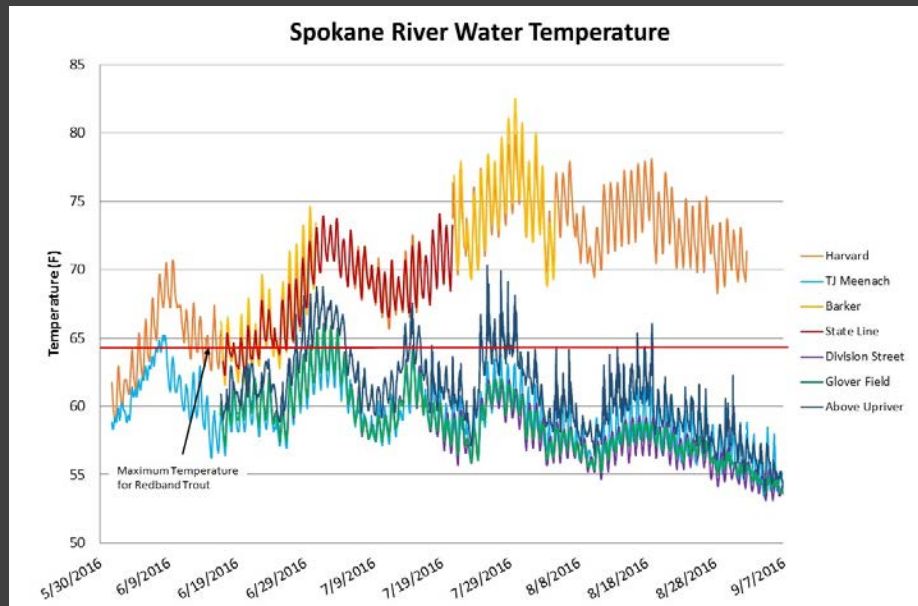
Estimating trends in river and stream water temperature using improved statistical methods

Brian Gray

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**Upper Midwest Environmental
Science Center**

La Crosse WI

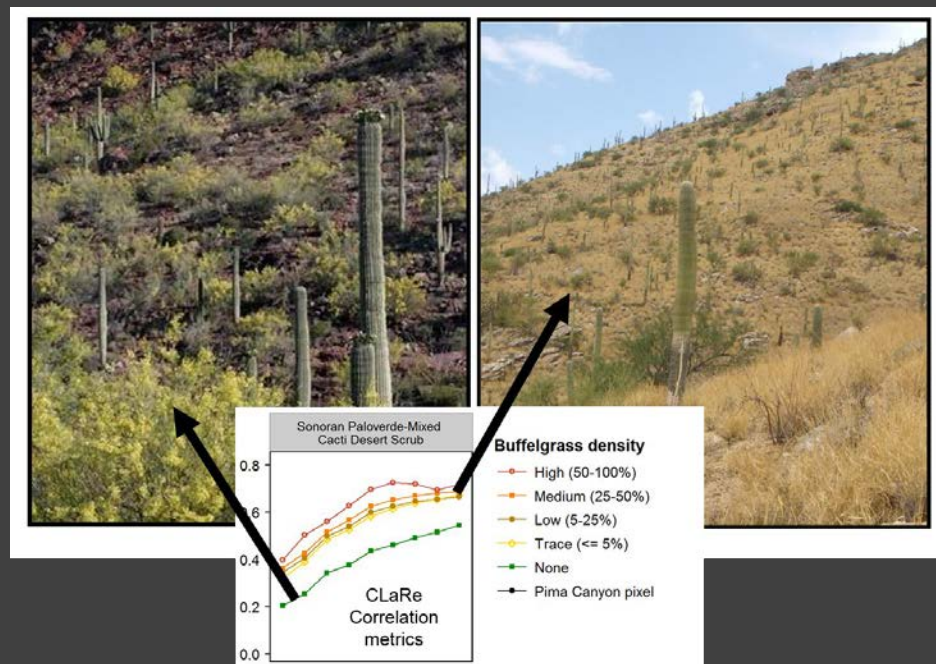


Climate-Landscape Response (CLaRe) Metrics: Applications for managers

Cynthia Wallace

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**Western Geographic Science Center
Tucson AZ**

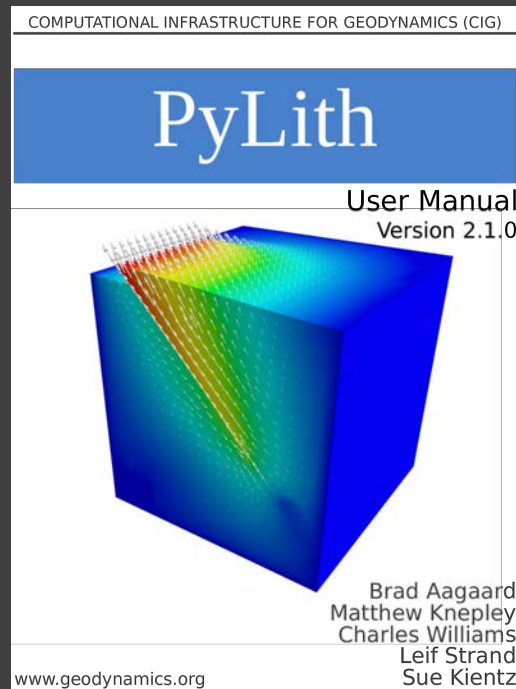


Extending PyLith to address your earthquake and volcanic deformation modeling needs

Brad Aagaard

baagaard@usgs.gov

**Geologic Hazards Science Center
Golden, CO**

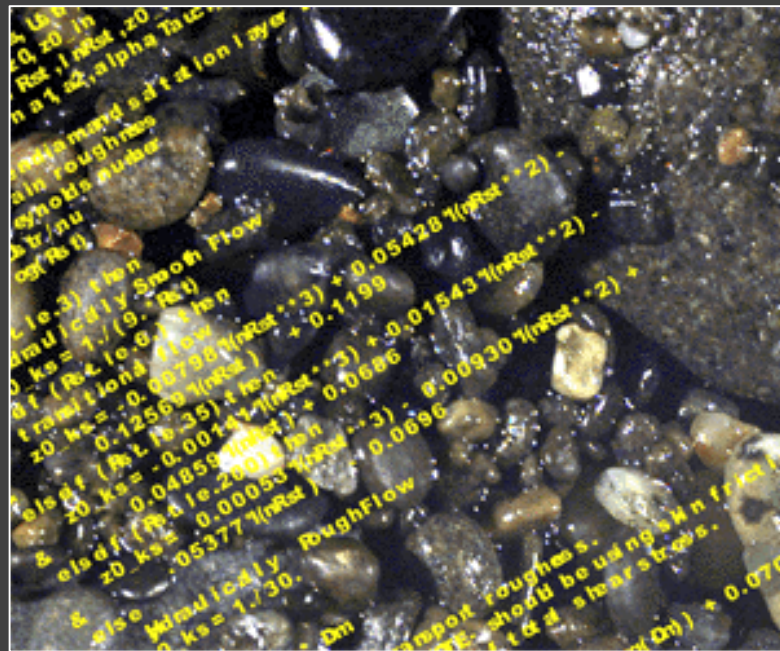


Chris Sherwood

csherwood@usgs.gov

**Woods Hole Coastal and Marine
Science Center**

Woods Hole MA





A National-scale river corridor model

Jud Harvey

jwharvey@usgs.gov

Water Mission Area

Reston VA



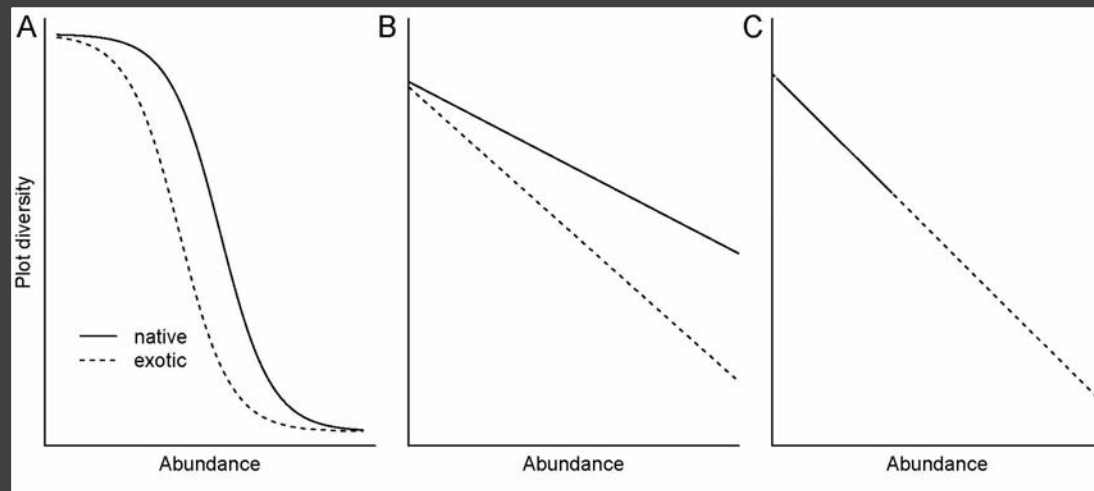
Helen Sofaer

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Pacific Island Ecosystems

Research Center

Hawaii National Park, HI

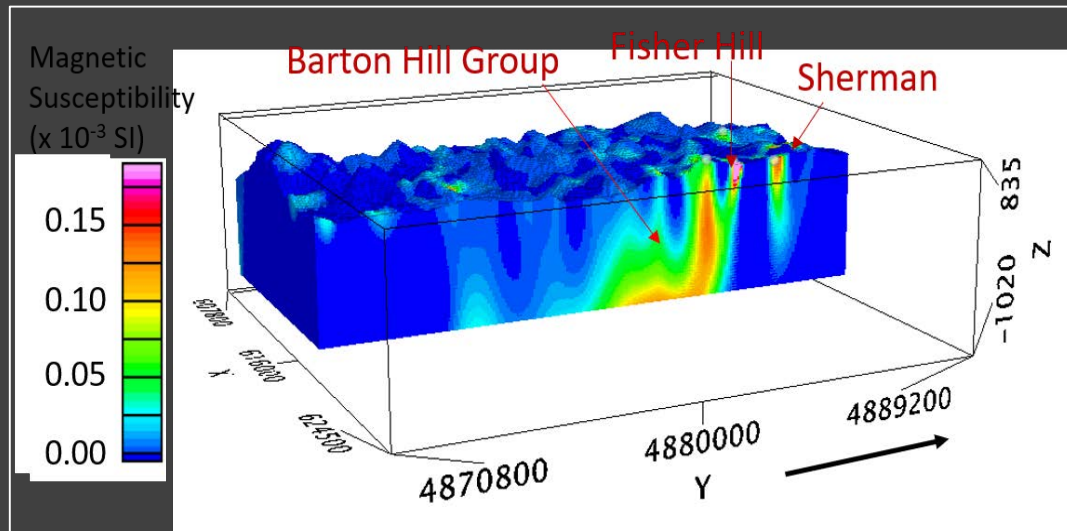


Developing tools to image the Earth in 3D using gravity and magnetic fields

Anjana Shah

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**Geology, Geophysics and
Geochemistry Science Center
Denver, CO**



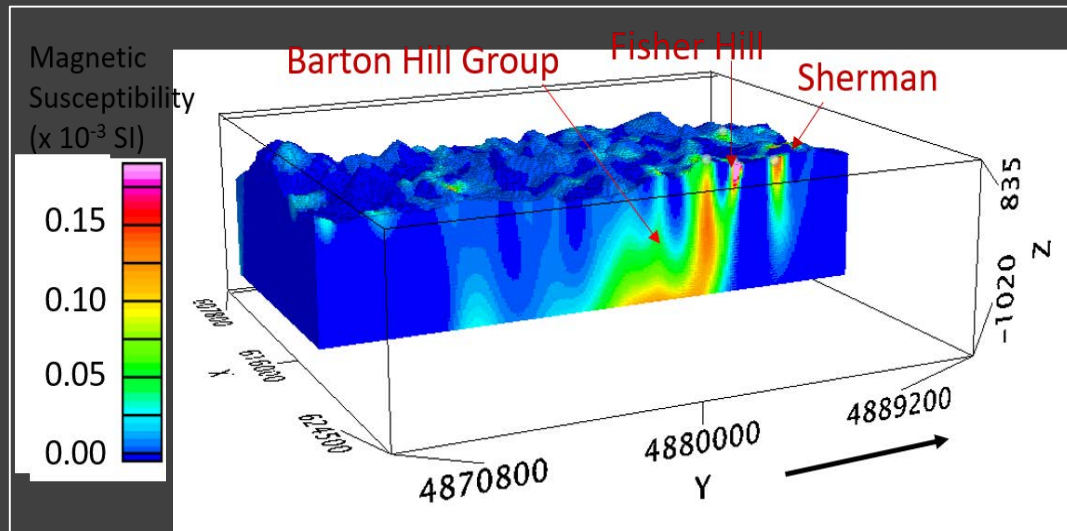
Geology, Hazards, and Minerals

Developing tools to image the Earth in 3D using gravity and magnetic fields

Anjana Shah

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**Geology, Geophysics and
Geochemistry Science Center
Denver, CO**



Geophysical studies into the architecture of large igneous systems hosting magmatic ore deposits

Carol Finn

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**Crustal Geophysics and
Geochemistry Science Center
Denver CO**



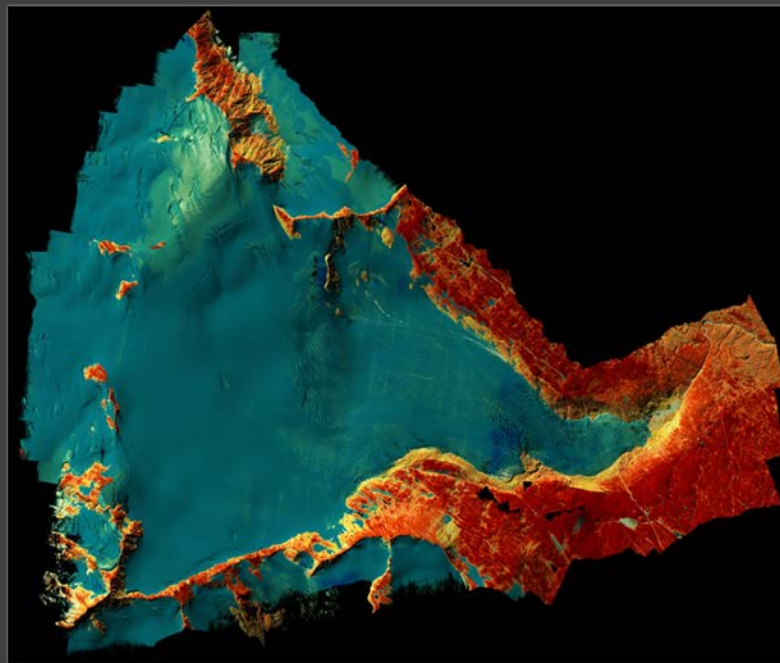
Are the USGS Benchmark Glaciers Spatially Representative? Using Geodetic Constraints to Develop a Regional Glacier Mass Balance Record

Shad O'Neel

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Alaska Science Center

Anchorage, AK

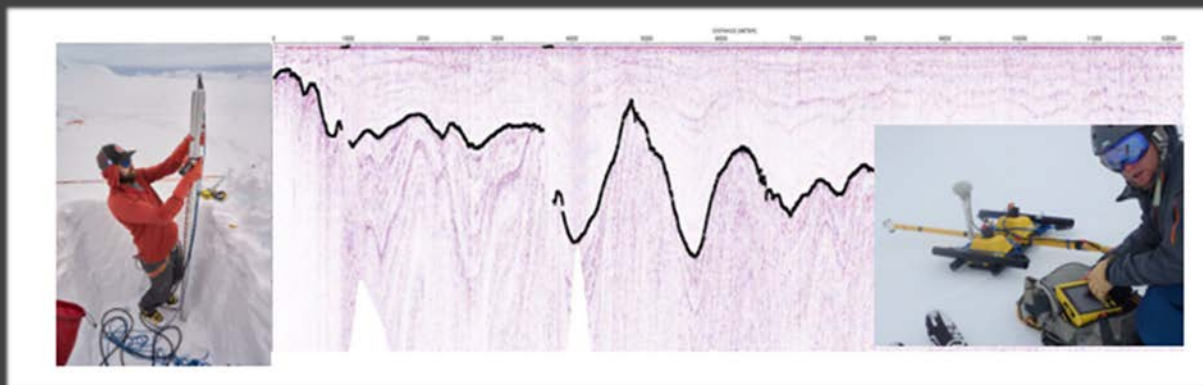


Resolving Spatial and Temporal Variability of Snow Accumulation in Mountain and Glacier Environments

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Anchorage, AK**



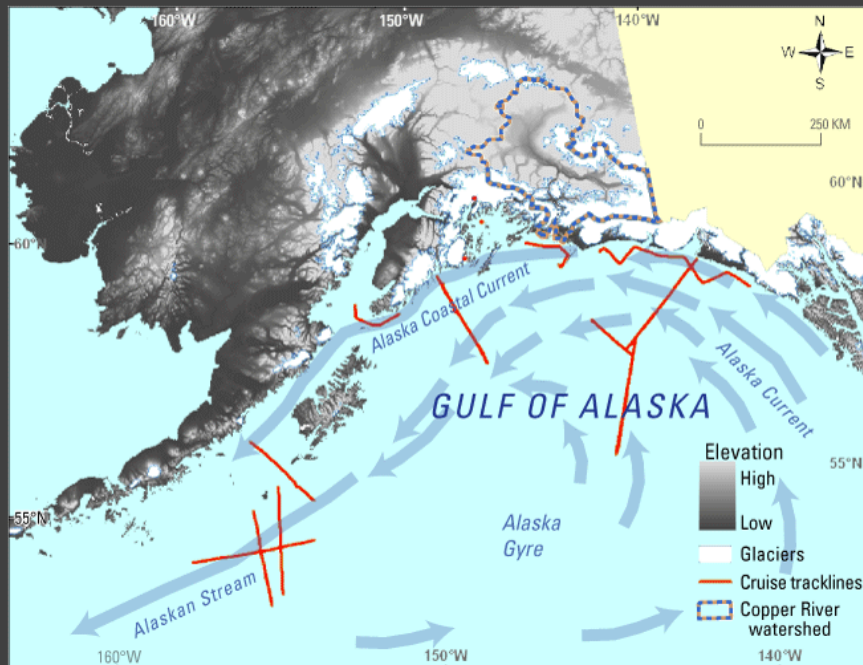
Examining Controls on the Solubility in the Ocean of Iron from Dust and Volcanic Ash

John Crusius

jcrusius@usgs.gov

**Alaska Science Center (at UW
School of Oceanography)**

Seattle, WA



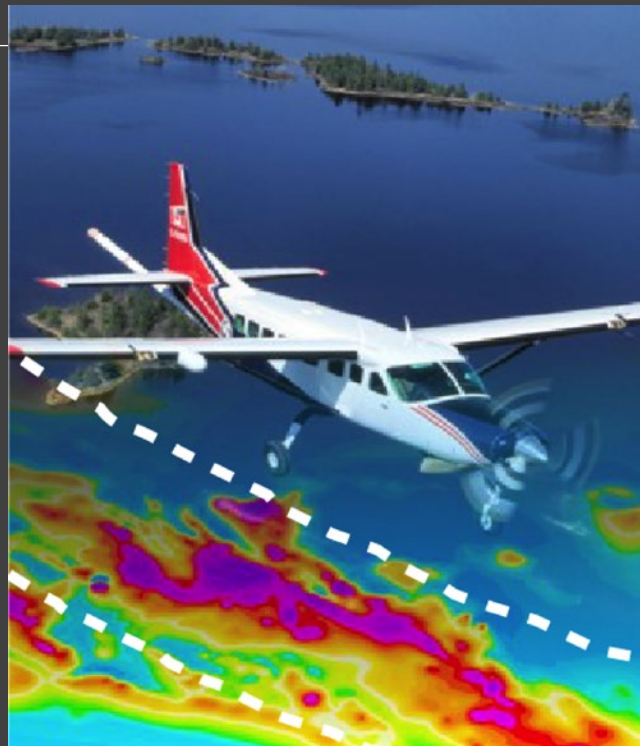
Water, ice, and alteration - airborne geophysical imaging of active volcanic systems

Paul Bedrosian

pbedrosian@usgs.gov

**Crustal Geophysics and
Geochemistry Science Center**

Denver CO



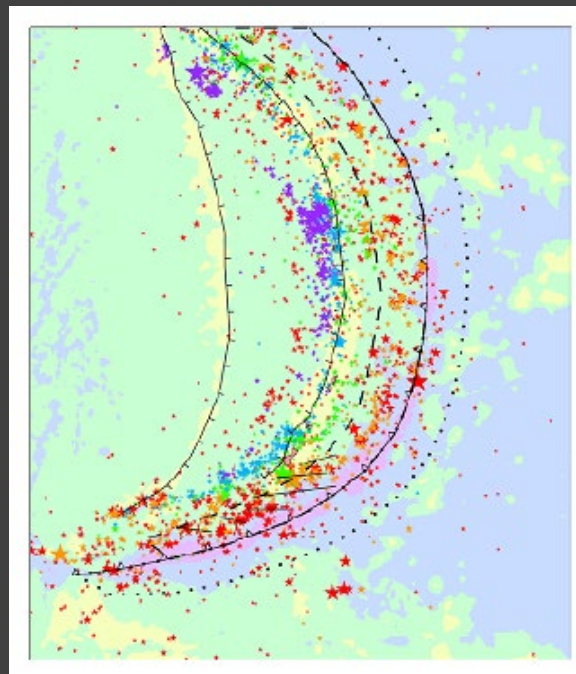
Extending subduction zone earthquake hazard assessments to risk

Nicholas Luco

nluco@usgs.gov

Geologic Hazards Science Center

Golden CO



Earthquake early warning seismic station adjustment terms

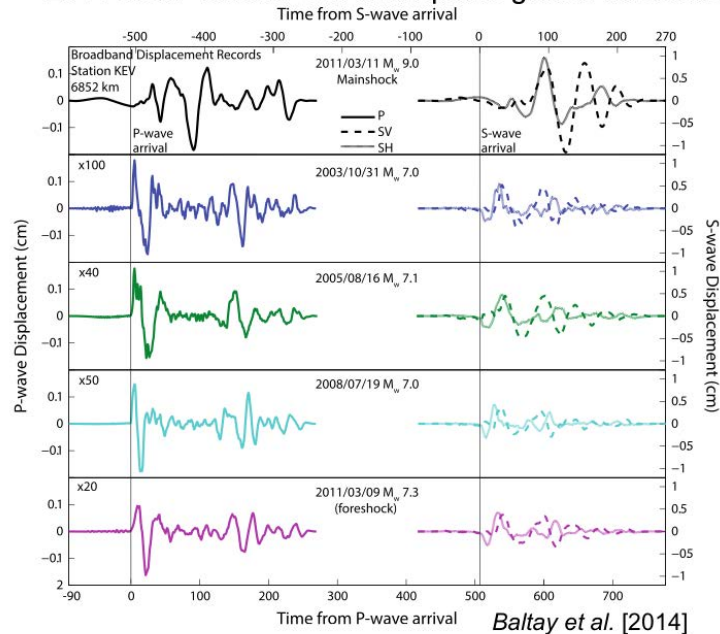
Annmarie Baltay Sundstrom

abaltay@usgs.gov

Earthquake Science Center

Moffett Field, Mountain View, CA

2011 M9.0 Tohoku-Oki earthquake global waveforms



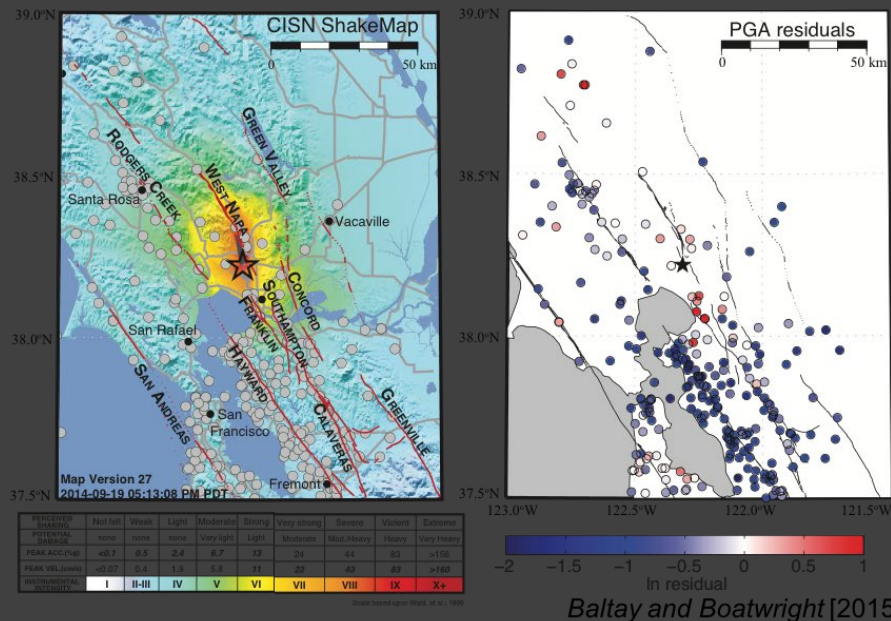
Regional attenuation in California in ground-motion modeling

Annmarie Baltay Sundstrom

abaltay@usgs.gov

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Menlo Park CA



Hazard and Losses from earthquake-triggered landslides and liquefaction

Kate Allstadt

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**Geologic Hazards Science Center
Golden CO**

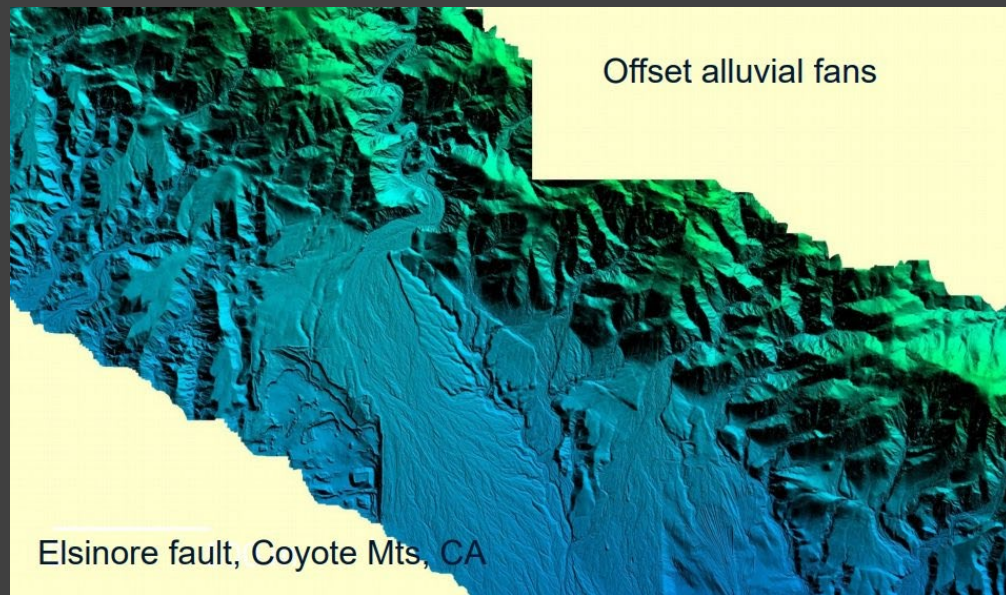


Determining fault slip rates from offset alluvial fan morphology

Ryan Gold

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**Geologic Hazards Science Center
Golden CO**



Holocene Seasonal Climatology in South-Central Alaska from Intra-annual Oxygen and Carbon Isotopes of Fossil Wood

Lesleigh Anderson

land@usgs.gov

**Geosciences and Environmental
Change Science Center**

Denver, CO



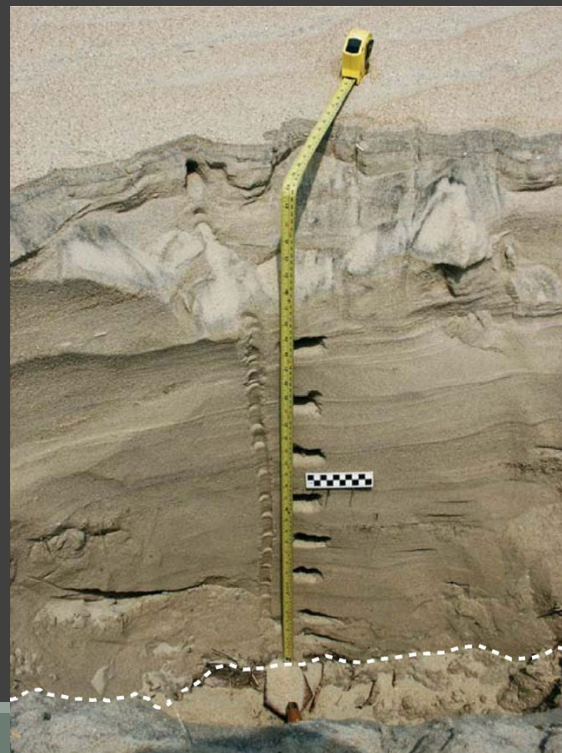
Linking Irma storm signatures to the Holocene sediment record for South Florida

Lynn Wingard

lwingard@usgs.gov

Florence Bascom Geoscience Center

Reston VA

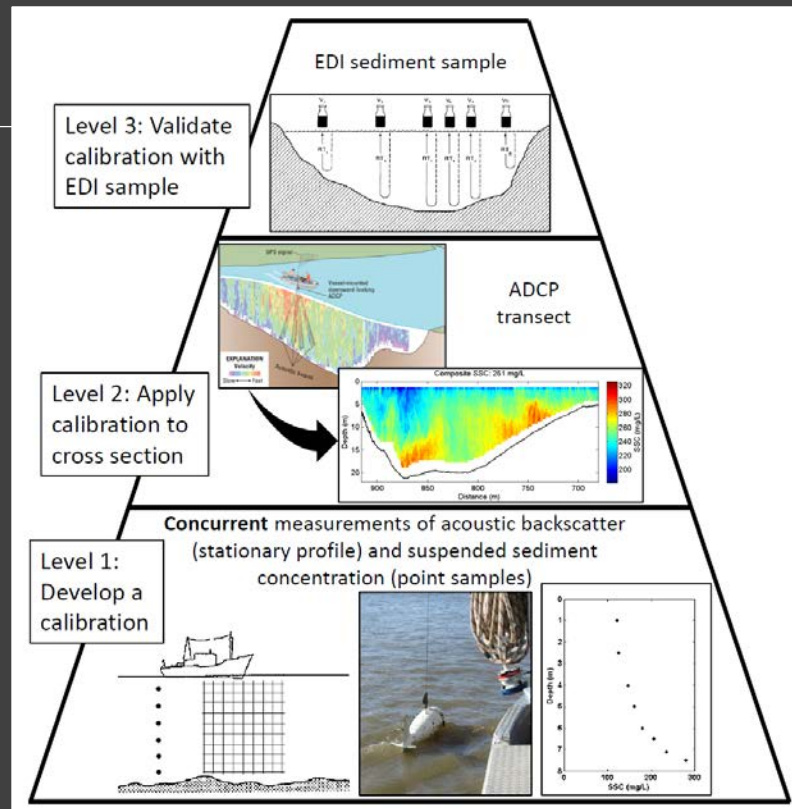


Kevin Oberg

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Office of Surface Water

Urbana IL

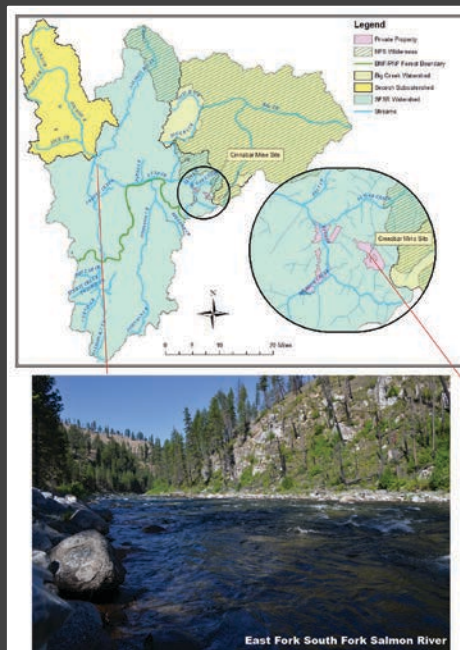


Yellowstone National Park Integrated Studies

JoAnn Holloway

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**Crustal Geophysics and
Geochemistry Science Center
Denver CO**



Study Objective:

Quantify impacts for historical mining activity on the East Fork South Fork of the Salmon River, Idaho.

Study components include:

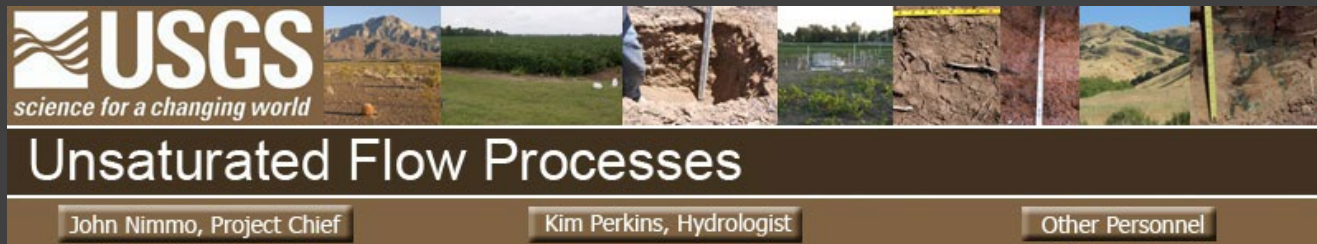
- 1) Mercury and sulfur isotope characterization.
- 2) Biogeochemical characterization of mercury and arsenic in the watershed.
- 3) Quantify effects on benthic invertebrates and fish.

<http://minerals.usgs.gov/science/yellowpine-trace-metal-mobility/index.html>



Hydrology, Hydrogeology, Watersheds

The Influence of Preferential Flow on Water and Solute Fluxes in the Unsaturated zone



John Nimmo

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Water Mission Area

Menlo Park CA

Daniel J. Goode

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**International Program, New Jersey
Science Center**

Lawrenceville NJ

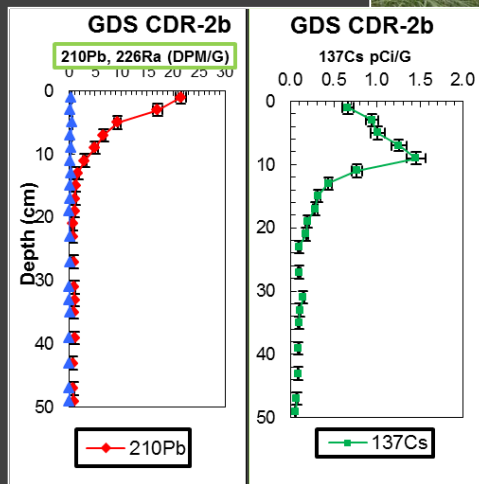


A Critical Assessment of Recent Soil Dating Methods in Coastal Wetlands

Judith Drexler

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California Water Science Center
Sacramento CA



Ecosystem Services of Urban Stormwater Management

Kristina Hopkins

khopkins@usgs.gov

**South Atlantic Water Science Center
Raleigh NC**





Dissolved organic matter dynamics from mountains to sea

Jamie Shanley

jshanley@usgs.gov

**New England Water Science Center
Montpelier VT**



*Opening the black box -- digging into watershed
dissolved organic carbon (DOC) processes to
interpret DOC dynamics at the outlet*

Jamie Shanley

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New England Water Science Center

Montpelier VT



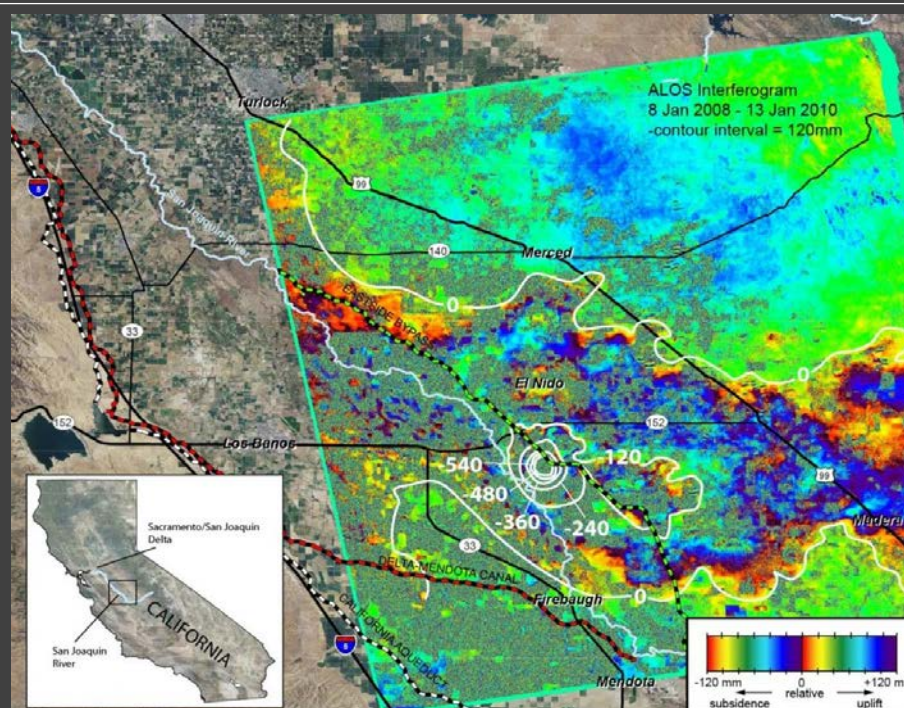
Operational remote sensing on the verge of changing water resources management

Kyle Blasch

kblasch@usgs.gov

Idaho Water Science Center

Boise ID



Assessment of Infiltration and Recharge due to Wetland Restoration in a Semiarid Ecosystem

Laura M. Norman

lnorman@usgs.gov

Western Geographic Science Center

Tucson AZ



Floodplain Interaction with watershed and estuarine processes; Impacts on water quality

Greg Noe

gnoe@usgs.gov

**Hydrological-Ecological Interactions
Branch**

Reston VA



Geomorphic influence on resilience of tidal freshwater wetland to sea level rise and salinization

Greg Noe

gnoe@usgs.gov

**Hydrological-Ecological Interactions
Branch**

Reston VA



Quantifying and explaining patterns in nutrient and sediment export from urban streams with the Chesapeake Bay watershed

Rosemary Fanelli

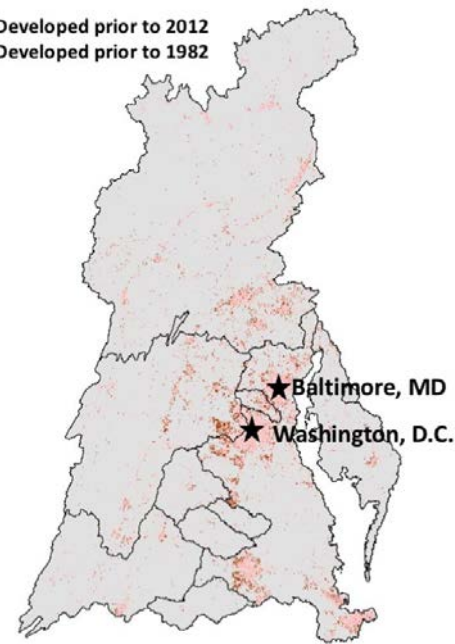
rfanelli@usgs.gov

**Maryland-Delaware-Washington DC
Water Science Center**

Baltimore MD

Urban land use

- Developed prior to 2012
- Developed prior to 1982



SOURCE: U.S. Conterminous Wall-to-Wall Anthropogenic Land Use Trends (WALT), 1974–2012

Evaluation of the National Streamgaging Network to Support Surface Water Characterization

Chris Konrad

cpkonrad@usgs.gov

Office of Surface Water

Denver, CO



Engineering and High Performance Computing

High Performance Computing for the Advancement of Earth Science

Janice Gordon

janicegordon@usgs.gov

**Core Science Analytics, Synthesis,
and Libraries**

Denver CO





Sophia Liu

Science and Decisions Center

Reston VA



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Themes



Opportunities by Field of Study



Opportunities by NSF Division



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Special skills/training Required:	Completion of a bachelors or masters degree in computer science, earth sciences related discipline (geology, biology, hydrology, etc.), applied mathematics, econometrics or related field. Background in environmental statistics and hydrology preferred. Applicant must be proficient in at least one computer programming language; preferably R.
Duties/Responsibilities:	1. Collection and analysis of daily streamflow obtained from approximately 6,000 streamgages across the Nation.

USGS Questions?

Contact Laura Corey

lc Corey@usgs.gov

703-648-6872

NSF Questions?

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703-292-8694