

## Northwest Region Emerging Leaders

# MUSCLE Team Newsletter



Some members of the MUSCLE Team. Clockwise from top left: Eric Grossman, Collin Eagles-Smith, Andrew Gendaszek, Stewart Rounds, Jeff Duda, Elena Nilsen, Chris Magirl, and Nancy Lee.

## The MUSCLE Team: Who, What, and Why

The USGS is a recognized leader in science spanning a wide range of environmental topics. In the Northwest Region, USGS researchers provide critical data and interpretation for complex topics as diverse as eel grass, salmon disease, oil extraction, groundwater, toxicology, earthquakes, mud, and frogs. USGS's complicated organizational structure (800 employees in 9 Science Centers within the Northwest Region) paradoxically presents both challenges and opportunities.

In late 2010, former Regional Executive, Leslie Dierauf, brought together a group of USGS scientists representing each Center in the Northwest Region with the intent of recognizing early-mid career scientists, providing a forum for cross-center exchange, showcasing Center science, promoting and encouraging professional development and strengthening USGS scientific leadership. After some fits and starts, this scientific community of practice evolved into the **Multidisciplinary Science Leadership (MUSCLE) team**. The MUSCLE team promotes collaboration, communication, and sharing of best practices among USGS scientists in the Northwest Region. As a multidisciplinary team, the MUSCLE Team provides an interface among society, colleagues, cooperators, and USGS Science Centers to identify and communicate solutions for increasingly complex problems facing the Northwest Region. MUSCLE develops strategies to implement integrated science, address organizational challenges, promote and increase interdisciplinary science, identify strategies to emerging science issues, and implement innovative techniques and partnerships. The MUSCLE team also promotes leadership opportunities for scientists throughout the organization and identifies ways to improve internal and external communications. (continued on page 2)

## Updates

**Working Group Established at Powell Center:** Scientists Jim O'Connor, Jeff Duda, Amy Draut, Chauncy Anderson and others were awarded Powell Center for Analysis and Synthesis support to establish a working group to synthesize the key processes associated with dam removals. The USGS scientists and a Powell Center Fellow (Ryan Bellmore, WFRC) will convene a working group of dam removal experts in 2014 and 2015. For more information, see <http://goo.gl/EpChMP> or contact Jeff Duda at [jduda@usgs.gov](mailto:jduda@usgs.gov) or 206-526-6282 x 233.

**USGS Researcher Honored with EPA Research and Development Award:** In October, USGS Western Fisheries Research Center scientist Deborah Reusser and collaborators from the Environmental Protection Agency received a bronze medal at the 32nd Annual Office of Research and Development awards ceremony. The PICES/NIS team was recognized for synthesizing the distributions and natural histories of marine/estuarine nonindigenous species in the North Pacific. The effort represents a novel approach to assessing nonindigenous species at large scales. For more information, contact Deborah Reusser at [dreusser@usgs.gov](mailto:dreusser@usgs.gov) or 541-867-4045.

**USGS Climate Change and Sea-Level Rise Guidance for US Army Corps of Engineers (USACE):** In July, USGS researchers with the Skagit Climate Science Consortium (SC2) met with the USACE Seattle District to provide insight on integrating projected climate change and sea-level rise into USACE efforts to mitigate flood hazards. The integrated research of the Skagit Climate Science Consortium strives to inform managers of the complex impact pathways affecting natural hazards, ecosystems, and climate change adaptation and to help identify mutually beneficial solutions that protect human lives and livelihoods while increasing ecosystem resilience. For more information, contact Eric Grossman at [egrossman@usgs.gov](mailto:egrossman@usgs.gov) or 206-526-6282, x 334.

(MUSCLE TEAM continued from pg. 1)

Two members from each Science Center in the Region typically serve staggered, two-year rotations on the MUSCLE team. Members rotating out work with their Center Director to identify new representatives. Two co-chairs are elected each March by the team to set agendas, facilitate activities, and delegate subcommittees. Meetings are held quarterly by phone and annually during the USGS PNW Science Conference.

This newsletter is a forum to communicate trends and hot science topics in the NWR. This newsletter also facilitates cooperation and collaboration between Centers and provide a tool to keep scientists informed.

In an organic sense, the MUSCLE team manifests the teamwork, partnership, and collaborations already happening within the USGS. While the MUSCLE team gathers once a quarter to look for ways to improve USGS scientific leadership and coordination, the entire USGS community is meant to be part of the larger MUSCLE team. Look for ways to collaborate with colleagues at other Centers, share best practices, and identify hot new trends ripe for USGS scientific leadership, and, if needed, find one of the MUSCLE team representatives at your Center to help spread the word.

Respectfully yours,  
Chris Magirl and Eric Grossman  
2013-2014 MUSCLE co-chairs.



*CHIPS tasks focus on the physical, chemical, biological, and socio-economic processes that influence restoration of Puget Sound's nearshore environment.*

## The Coastal Habitats in Puget Sound Project Spans Multiple Disciplines

As scientists tackle increasingly complex problems associated with pressures from urban growth, land-use, habitat loss, and impending climate change, the need for multidisciplinary research intensifies. By drawing on different scientific perspectives, technical methods, and an integrative framing of research questions, multidisciplinary approaches can yield larger benefits than collections of individual studies. Although the advantages of collaboration may be apparent, there are challenges to bridging scientific disciplines, even within a single organization like the USGS. Scientists have different backgrounds and cultures, reside in different cost centers, and operate with different funding models and managerial practices. Despite these differences, which took time to understand and overcome, the multidisciplinary Coastal Habitats in Puget Sound (CHIPS) research project (<http://puget.usgs.gov>) has become an example of the benefits available when the USGS plays to its multidisciplinary strength.

CHIPS was initiated after a 2001 review of the USGS by the National Academy of Sciences recommended that the USGS engage, "...in integrated, coordinated science when dealing with the types of multidisciplinary mission-relevant problems addressed by the USGS. ***The USGS should place more emphasis on multi-scale, multidisciplinary, integrative projects that address priorities of a national scale.***" In response to this critique, the USGS initiated a number of such projects, including CHIPS.

Due to a variety of factors, the Puget Sound and its ecosystem services (e.g., habitat for fish and wildlife populations, water-quality) have declined, prompting resource managers to establish plans to restore the Sound by 2020. The CHIPS project focused on two facets of the larger effort, causes of population declines and responses of the ecosystem to restoration actions. Multidisciplinary teams were assembled for the following tasks: (a) urbanization effects on the nearshore; (b) restoration of large river deltas; and (c) Elwha River restoration.

The *Large River Deltas* task supports floodplain, estuary and nearshore restoration in the Nooksack, Skagit, Stillaguamish, Snohomish, Nisqually and Skokomish deltas. Reconstructions of historical habitat change provide a reference to guide future restoration efforts. Assessments of habitat use by nearshore biological communities inform models of delta and estuary function. Working closely with decision makers the project helps identify (continued on pg. 3)



***Science Centers Combine Forces:*** In October 2013, the Wyoming-Montana Water Science Center was created. The new center merged the staff and equipment of seven offices located across both states, broadening the scientific capability available to all cooperators. The geographic area covered by this Center is the third largest in the Nation. For more information, contact John Kilpatrick at [jmkilpat@usgs.gov](mailto:jmkilpat@usgs.gov), 307-775-9162.



*USGS brings multidisciplinary expertise to the question of coal transport.*

## **USGS Explores Impacts of Increased Coal Transport in the Northwest**

The environmental and human health impacts of increased coal transport are poorly understood. Voters and policy-makers must decide whether to develop four proposed coal transport systems and terminals in the Northwest while weighing strong opinions on all sides. USGS has broad interdisciplinary capacity to provide knowledge to inform coal transport decisions, but must be strategic about where to start. Recently the USGS Northwest Regional office provided a small amount of funding to a team of USGS scientists, including several members of MUSCLE, to identify coal transport related issues and associated USGS science capacity to address these topics. One objective is to coordinate with partners and attract additional funding for critically needed science.

Thorough consideration of coal transport requires expertise in GIS, contaminants, ecology, natural hazards like flooding, earthquakes and landslides, climate change modeling and hydrology. USGS science centers in the Northwest have valuable capacity to deliver this interdisciplinary science.

The NW Coal Transport Science Team funded by NW Region Flex Funds includes members from water and ecology science centers across Washington, Idaho, Montana, Wyoming and Oregon. The group put together a brief issues paper and is currently brainstorming which of the many questions they could best answer with their varied tools and expertise.

The team will offer technical support to partners like the Tribes, states, the Army Corp of Engineers, and NOAA's National Marine Fisheries Service, all of whom are currently assessing the potential impacts of six proposed coal transport projects. Recently initiated EIS analyses for transfer projects in Bellingham and Longview, Washington, would benefit from technical input to address the impacts of coal transported by train from Montana and Wyoming to Pacific ports. Similarly, the potential impacts of delivering the coal to the Morrow Pacific transfer project in Boardman, Oregon, and transferring it to barges for transport along the Columbia River to overseas markets in Asia could benefit from research to help address the concerns of the Affiliated Tribes of Northwest Indians. The tribes are concerned about potential impacts to public health, natural resources and the economy in case of a spill. The NW Coal Transport Science Team hopes that the objective, timely information produced will benefit area partners and citizens as they wrestle with difficult (continued on pg. 4)

(CHIPS continued from pg. 2) ways to enhance ecosystem function while reducing storm surge flood hazards to people and infrastructure. The *Urbanization* task focused on characterizing hydrodynamics, water/sediment chemistry, eelgrass, and forage-fish habitat within and outside of a small urban area, to better understand effects from development. They used forage fish as a key biological endpoint, examining shoreline development and spawning habitats; relations between eelgrass health and use by forage-fish; and the role of forage-fish as a pathway for river-borne contaminants to enter the food web.

The *Elwha* task (<http://www.usgs.gov/elwha>) studied coastal habitats near the Elwha River, where two large dams are being removed. Expecting huge volumes of reservoir sediment to be transported downstream, with large possible effects to coastal habitats and biota, the team focused on key attributes in the lower river below the downstream dam, the estuary, and the nearshore environment by the river mouth. By studying these habitats before, during, and after dam removal, the team is testing conceptual and physical models of ecosystem response; how dam removal can affect ecosystem structure and function; and whether restoration goals for valued ecosystems are being met.

The successes of CHIPS have been multifaceted. By addressing research questions relevant to many Puget Sound managers and stakeholders, USGS has forged new and exciting collaborations. For example, each task has involved working side-by-side with Tribal scientists, in many cases on Tribal lands, building important and lasting research partnerships. CHIPS scientists have published over 50 scientific journal articles, given hundreds of research presentations, and convened symposia or presented invited talks at regional, national, and international symposia. Finally, while faced with a challenging financial climate, each CHIPS task has leveraged resources to obtain additional reimbursable funding. As the USGS continues to provide scientific leadership for the Northwest region, the ability to field multidisciplinary teams is a strength that we should continue to foster and support. Story by Jeff Duda. For more information **contact Jeff at [jduda@usgs.gov](mailto:jduda@usgs.gov) or 206-526-6282 x 233.**



*Thorough consideration of coal transport requires expertise in GIS, contaminants, ecology, natural hazards, climate change modeling and hydrology. USGS science centers in the Northwest have valuable capacity to deliver this interdisciplinary science.*

(COAL TRANSPORT continued from pg. 3) decisions.

In the future the NW Coal Transport Team intends to:

- work with federal partners to further refine science needs
- identify tribal concerns
- identify additional funding sources
- coordinate with HQ program coordinators to highlight the potential for integrated science in the NW
- develop a science initiative that best fits the identified needs.

Story by Lisa Hayward and Elena Nilsen. For more information **contact: Bob Black at [rwblack@usgs.gov](mailto:rwblack@usgs.gov) or 253-552-1687.**



Since 2008, the Coast Salish Nation and Swinomish Indian Tribal Community has partnered with the USGS to examine the waters of the Salish Sea by blending western science and Coast Salish culture in the annual Salish Sea Journey. For more information visit: <http://go.usa.gov/ZArw>

## USGS Engages with Native American Tribes in the Northwest

From rivers in the Northern Rocky Mountains to the shores of Puget Sound, USGS provides critical science, data, information, tools and expertise to Native American tribes in support of their resource management needs. The diversity of the tribes throughout the Northwest and the natural resource management challenges they face is reflected in the variety of cooperative projects being conducted by USGS in the Northwest. Several themes emerge, including the effect of water quality on aquatic species traditionally harvested by tribes, limitations to streambed spawning, and the ecological effects of habitat restoration. Northwest science to support tribes and tribal resources includes WAWSC work with the Stillaguamish Tribe to identify the type and magnitude of contaminants from wastewater treatment plants, the effects on Chinook salmon, and establishment of a baseline for future studies. Sampling and analysis of sediments conducted by ORWSC in the Columbia River Basin enhances the understanding of contaminants of emerging concern that threaten both human health and Pacific lamprey viability. The MTWSC study of the quality of groundwater resources on tribal lands will assist in determining the water quality of aquifers on the Fort Peck and Northern Cheyenne Reservations near oil and coal-bed methane resources. In northern Idaho, biologists with the WFRC recently completed a study in cooperation with the Kootenai Tribe that determined the suitability of available substrate on the timing of hatch and success of White Sturgeon. Meanwhile hydrologists with the WAWSC worked with the Muckleshoot Tribe and other members of the Cedar River

Instream Flow Commission to determine the timing of salmon-redd scour during high flows in the Cedar River in western Washington. Finally, the USGS has played a large role in studying the effects of habitat restoration. Notably, as part of the recent removal of dams on the Elwha River scientists from WFRC, WAWSC, and PCMSC, in cooperation with the Lower Elwha Klallam tribe, have studied the geomorphic and biologic response from the former reservoirs to the Strait of Juan de Fuca. The CHIPS Large River Deltas Project helps the Nisqually, Skokomish and Stillaguamish Tribes assess the success of the largest estuary restorations in the PNW and identify opportunities to recover wetlands vulnerable to sea level rise. The team also works with the Swinomish Tribe and Samish Indian Nation to evaluate potential climate-related impacts to coastal resources in the Skagit River and nearshore habitats.

Centers within the Northwest Region have been active in providing technical trainings to the staff of Native American tribes funded by the USGS TESNAR (Technical Trainings in Support of Native American Relations). In 2013, scientists from the ORWSC taught a class in Suspended Sediment Data Collection Techniques. In 2012 scientists from the WAWSC taught a class in fiber-optic distributed temperature sensing. In coordination with WFRC, WAWSC also ran a workshop on using fish scales and otoliths (ear bones) to age fish and understand their life history. NOROCK and the WY-MT WSC both developed multi-day field courses addressing forest management and water resources management at Salish-Kootenai College in Montana. Currently the Northwest Regional Office and Science Centers are working to develop sessions with tribes to identify significant tribal concerns and present information on Centers' science capacity to assist in addressing challenges. Story by Andy Gendaszek. For more information **contact Andy at [agen-dasz@usgs.gov](mailto:agen-dasz@usgs.gov) or 253-552-1612.**



USGS science helps Northwest Tribes manage natural resources like salmon and trout. Here Rachel Breyta, a scientist with Western Fisheries Research Center, helps diagnose disease as part of a field study with staff from U.S. Fish and Wildlife Service and the Northwest Indian Fisheries Commission.

For more information:  
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