

# Collaborative Activities between the U.S. Geological Survey Oregon Water Science Center and Portland State University, January 2010–March 2011

Oregon Water Science Center and Portland State University have enjoyed a mutually beneficial relationship for nearly 5 years. On June 8, 2007, The U.S. Geological Survey (USGS) Oregon Water Science Center (ORWSC) and Portland State University (PSU) established a joint program of research, education, and outreach. Shortly thereafter, the ORWSC moved onto campus in the Science and Education Building. In the ensuing years, PSU students and faculty and USGS scientists and their customers have enjoyed an extraordinary relationship that



focuses on scientific investigation and management of water resources in the State of Oregon and the Pacific Northwest.

Beyond straightforward site and basin hydrologic studies, the USGS–PSU collaboration includes scientific investigations that improve the “state of the science” and our understanding of hydrologic, geologic, and biological processes. This fruitful collaboration could not be fully realized without collocation of the ORWSC on the PSU campus and the Collaborative Research Work Group, composed of ORWSC and PSU scientists, who provide oversight, guidance, and strategies for collaborative research and educational activities.

Under this Cooperative Program, PSU academic programs and facilities are joined with ORWSC scientists and resources to pursue joint research and consultation in hydrologic science. The outstanding strength of this collaboration is the profound effect it has on the lives and careers of PSU students involved in the following subjects:

- Biology
- Chemistry
- Climate Science
- Computer Science
- Engineering (Environmental, Civil, Electrical, Mechanical)
- Environmental Science
- Geography
- Geology
- Invasive Species
- Microbiology
- Spatial Analysis and Remote Sensing
- Statistics

Since its inception, the collaborative partnership has touched the lives of dozens of students. Several PSU undergraduate and graduate students are now employed by the USGS at the Water Science Center. USGS staff and scientists have also profited from the relationship, stimulated and energized by new ideas, new techniques, and the inexhaustible curiosity of young scientists.

USGS is committed to a future with PSU. Water resources and hydrology will be at the center of this century's challenges. Every socially important issue—energy, agriculture, hazards, ecosystem health, climate change, sustainability—involves water. Many of PSU's most important academic and research programs have hydrology at or near their core. The fit is a natural one and has great promise for our collective future.

Some change will come to this collaborative effort. USGS and PSU are now poised to renew their Collaborative Research Agreement for another 5 year stretch. With some minor modifications to ensure better reporting and communication, we anticipate that the renewal for another 5 years will be easily executed. But, both parties have a larger vision for our future relationship. USGS and PSU have had an excellent “first lap” and have learned much, but there is much more to be achieved. Ideally, the USGS would like to enter into a long term colocation agreement with PSU, one that solidifies the ORWSC's position on campus and more fully integrates its collaboration with relevant PSU departments. ORWSC is very interested in a PSU building that could house its staff and equipment while providing a learning environment for students and a collegial forum for faculty. PSU could benefit from having the Nation's premier science agency located on its campus as a stable, long-term partner. We look forward to realizing that vision over the next 5 years.

What follows is a recap of USGS/PSU cooperation and collaborative activities for the 15 months from January 2010 to March 2011. In that time, USGS has employed 10 undergraduate and graduate students, had dozens of professional collaborations with PSU faculty, has acted as advisor or mentor to 8 PSU students, and has expended more than \$800,000 to pursue collaborative science with PSU students and faculty. PSU students were primary author on 3 publications and a contributing author on 10 additional publications. USGS and PSU presented two brown bag series and a graduate credit seminar series in this time. PSU students working with

the USGS presented joint projects at 5 conferences and workshops. Early in FY 12, the Collaborative Research Committee will convene after an 18 month hiatus. Our collaboration continues to have tangible benefits for both USGS and PSU and continues to grow.



### **Chauncey Anderson (USGS Hydrologist):**

- Tara Chestnut, PhD candidate, has been working on the Amphibian Research and Monitoring Initiative (ARMI) program since July 2009. Her work for USGS will contribute to her doctorate. Tara is also expected to get at least one journal publication out of her work for the ARMI program. Among her accomplishments while at USGS, Tara learned



about Occupancy Analysis at the U.S. Fish and Wildlife Service Training Center at Shepherdstown, West Virginia; learned qPCR and sample extraction techniques at the laboratory

of Dr. Mary Voytek and Julie Kirshtein of the USGS National Research Program; taken the lead on the Pacific Northwest ARMI region's contribution to a national study to evaluate chytrid fungus' relationships with pesticides and nutrients in water and amphibian tissues; consolidated USGS chytrid fungus data in water nationally into an ARMI database; given presentations at two national ARMI meetings; and taken an progressively larger role in planning for the ORWSC's ARMI program.

- Member of the PSU Bioinvasions Research Group, initiated in 2010 by Dr. Mark Sytsma, ESM department.

### **Erick Burns (USGS Ground-Water Hydrologist and PSU adjunct):**

Collaboration with PSU students:

- Advised Hazel Owens, biology and geology undergraduate student, on career aspirations and graduate school application. Recommended Hazel for a hydrologic field methods workshop for undergraduate students near Chillan, Chile, which she attended. Hazel has now been accepted for graduate school at Oregon State University and is the recipient of a prestigious graduate student fellowship.

Collaboration with Ben Perkins (Geology):

- Gave a groundwater hydrology lecture for Groundwater Geology (G443/543) course.

Collaboration with PSU community:

- Represented USGS on Geology Department career panel for the student chapter of SEG to answer questions about working as a hydrologist and federal employee. There were also three consultants and one state employee on the panel.
- Co-coordinator of the USGS lunchtime brownbag lecture series, which PSU faculty and students attend. Coordinated with Andrew Fountain (Geology Dept.) and John Rueter (ESM) in preparation for the first joint PSU/OSU/USGS seminar series (will be in spring term 2011).

**Charles Cannon (USGS STEP [Student Temporary Employment Program], Hydrology – PSU M.S. Student, Geology):**

- STEP appointment, working with Jim O'Connor on lower Columbia River habitat classification project.
- Fluvial geomorphology/sediment transport projects with Jim O'Connor and Rose Wallick on rivers in southern Oregon.



- Thesis topic (lower Columbia River geomorphology) is based on work done with USGS (lower Columbia River habitat classification)
- Received Graduate Certificate in Geographic Information Systems from Geography department in fall term, 2010.

**Kurt Carpenter (USGS Hydrologist):**

- Kurt met with Rich Miller, PSU graduate student of Mark Sytsma, to discuss monitoring of algal blooms.

**Rob Chapman (USGS Hydrologic Technician):**

- BS Degree, June 2010
- Converted to a full time USGS employee February 2011.

**Ryan Cole (USGS STEP Hydrologic Technician, PSU M.S. Candidate, Geology):**

- Teaches two courses as a Graduate Assistant – GIS and a Rocks and Minerals Course.

**Terrence Conlon (USGS Groundwater Hydrologist/Geologist):**

Collaboration with Geoffrey Duh, Geography

- Coordinated Geoffrey Duh, PSU Geography and USGS staff on development of a GIS tool to evaluate the effects of inundation of restored wetlands along the shore of Upper Klamath Lake (7/19/2010)

Collaboration with Andrew Fountain (Geology)

- Collaborate with PSU Facilities and Planning and Geology Departments on collecting data in geothermal heat pump wells planned for Science Building 2 (ongoing).
- Initial planning for a groundwater research project and teaching tool centered on the new SB2 well.

Collaboration with ESM

- Collaborated as representative of advisory committee member on Environmental Science and Management Department's Professional Science Masters program.

#### Collaboration with PSU community:

- Provided letter of support and was member of community partnership for Ecosystem Services for Urbanizing Regions (ESUR) Program—Intergrated Graduate Education and Research Traineeships (IGERT). At partnership and PSU meeting, presented potential USGS projects for consideration of IGERT collaboration (9/23/2010).
- Presented at PSU Career day to inform students about careers at USGS (2/17/2010).
- Participated in discussions with PSU on involvement in Climate Science Centers (2/19/2010).
- Met with PSU and representatives of Shanghai Environmental Protection Bureau to discuss opportunities to collaborate on water protection studies in Shanghai in upcoming exchange program (4/26/2010).
- Member of panel for PSU chapter of the American Society for Photogrammetry and Remote Sensing (5/21/2010).
- Work with Ian Stude, transportation coordinator, to insure bike facilities available to USGS staff and to encourage bicycle commuting at USGS.



#### **Dar Crammond (ORWSC Director/ Hydrologist):**

##### Collaboration with PSU School of the Environment:

- Monthly meetings with PSU Executive Committee to address the business of the School of the Environment.
- Collaborated with Geology, Geography, ESM and others to build a vision of a collocation space. Engaged architects from IDC for visioning process.
- Compiled interactions between USGS and PSU for calendar year 2010 for Collaborative Research Agreement Reporting.
- Planning and research to re-invigorate the Collaborative Research Committee, with an initial meeting June 2011.
- Met with Jonathan Fink to discuss the future direction of research partnership between USGS and PSU. Attended the Decision Theater presentation on June 1, 2011.
- Dar and Greg Fuhrer met with Denise Wendler to discuss the Collaborative Research Agreement and a host of other USGS/PSU issues.
- Participated in the USGS/PSU/OSU Research Colloquium Series Symposium series in Spring 2011, providing lodging support and hospitality to visiting scientists.

#### **Micelis Doyle (USGS Hydrologic Technician, PSU M.S. Student, ESM):**

- Twice per year Micelis works with Mary Ann Schmidt of the Center for Science Education Department at PSU to prepare nutrient standard solutions for their Student Watershed Research Project (SWRP) QA/QC project.

**Greg Fuhrer (Associate Director, Hydrologist):**

- In February 2011, Greg presented a seminar series lecture to Civil Engineering Masters Students in David Jay's Course which explores the climate, hydrologic and fluid mechanical processes that shape the Columbia River basin ecosystem, and relates these processes to the basin's management context. Greg provided an overview of USGS, its post realignment structure, its strategic plan and mission areas, and several examples of relentless science on going at the Oregon Water Science Center, including management implications to the Columbia Basin.
- In Sept. 2010, Greg prepared a letter of support for David Jay and the PSU Sustainability Center for a Compton Foundation Grant to study the sediment budget of the Lower Columbia River Estuary. This work is important for flood forecasting, fisheries, habitat restoration, contaminant transport and many other important water management areas.
- In January 2010, Greg worked with OWSC staff and provided proposal concepts to David Jay to plan for an RFP to the Miller Foundation. This was an opportunity for PSU to acquire a significant amount of funds for strategic staff hires and to focus some University effort toward Hydrologic studies in the Columbia River Basin.

**Marshall Gannett (USGS Ground-Water Hydrologist/Geologist and PSU adjunct):**

Collaboration with Christina Hulbe (Geology):

- Scott Waibel, (Geology M.S. candidate) is using USGS Deschutes Basin Models (DPM and MODFLOW) with down-scaled climate model data from Mike Dettinger (USGS, La-Jolla, CA) to explore possible effects of climate change on hydrologic conditions in that basin. This project was funded by a grant from the U.S. Bureau of Reclamation. Scott

successfully defended his thesis Model analysis of the hydrologic response to climate change in the upper Deschutes Basin, Oregon in November 2010. Scott's advisor and Committee Chair was Christina Hulbe; I served on his committee as Adjunct Professor. Scott, Dr. Christina Hulbe, Dr. Heejun Chang (Geography) and I are presently working on a journal article describing this work.

Collaboration with Mike Cummings (Geology)

- Marshall is also working on two journal articles with Mike Cummings (Geology) and Kenny Janssen (Geology, M.S. Graduate). These are based on Kenny's master's thesis which was an energy budget evaporation estimate for Upper Klamath Lake. Marshall developed the concept for Kenny's project and served on Kenny's thesis committee. The work was conducted in collaboration with Tammy Wood in the ORWSC.

Presentation to Geology Students

- Gave a seminar at the Geology Department (2/17/10) on groundwater modeling in the Klamath Basin.

Collaboration with Geology Students

- Met with Scott Burns (Geology) and graduate student Ryan Cole (a student employee in the OWSC) to discuss Ryan's thesis project. I may serve on Ryan's committee but this has not been formalized.
- Met with Frank Granshaw (Geology doctoral student) to evaluate a landscape visualization tool for = geology educators.

Collaboration with Dr. Heejun Chang (Geography)

- Coauthored the chapter entitled Climate Change and Freshwater Resources in Oregon in the Oregon Climate Assessment Report produced by the Oregon Climate Change Research Institute at OSU. This the first major synthesis of the hydrologic response to climate changes in Oregon.

- Currently working with Heejun Chang, his post doc researcher Il-Won Jung and graduate student Madeline Steele on a journal article analyzing the causes of observed declines in late-season streamflow in Oregon over the second half of the twentieth century.
- Met multiple times with Heejun Chang and his post doc researcher Il-Won Jung to advise them on a surface-water/groundwater modeling project using GSFLOW.

Member of the PSU Geology Alumni Committee

**Jami Goldman (USGS SCEP (Student Career Experience Program), Biologist):**

- Collaboration with Jim Pankow and his research scientists:
- 2009-2010, collected water samples for Pankow’s lab at study sites on the Tualatin and Clackamas Rivers for them to test their new methods of analyzing emerging contaminants and personal care products.
- Worked with Lorne (Pankow’s lab) to develop a more efficient water sampling device.

**Tana Haluska (USGS Geographer)**

Collaboration with Geoffrey Duh (Geography)

- Tana collaborated with Professor Duh, who has been generous with his time and advice on approaches to computer programming using VB.NET/ARC OBJECTS for the Shoreline Phase II project. He has provided VB code for a similar tool that he built in ArcMap, which has been a great resource.
- Tana audited a VB.NET/ARC OBJECTS class during the winter term 2010–2011. The classroom participation and one-on-one discussions has greatly enhanced her ability to perform the coding necessary for the Shoreline project. Another advantage of attending the classes at PSU is that Tana is now on the PSU-GIS-Programming list server that pro-

vides a community in which programming questions and discussions can take place.

Collaboration with David Percy (Geology)

- Audited Professor Percy’s Python scripting class for GIS in the spring term 2009–2010. This training enabled Tana to perform geoprocessing tasks in ArcMap using Python scripts.

Collaboration with PSU Department of Fine Arts

- Tana identified students that would like to work on an art display for the USGS offices in the 5th Avenue Business Center. Three students were interviewed and went into the field with USGS scientists to learn more about the USGS.

**Tessa Harden (USGS SCEP-Student, hydrology–PSU PH.D Student, ESM/Geology)**

- Tessa worked with Jim O’Connor on the Black Hills Paleoflood Project. Results should be published this year.



- Tessa worked with Stewart Rounds on the Tualatin QW Assessment Study (Fanno Creek geomorphology and field sampling support)
- Tessa worked with Dan Snyder and John Risley on the Klamath OFF-Water Project (GIS support)

**Jon Haynes (USGS Hydrologist, Groundwater):**

- Geophysically logged a new deep well on PSU campus to study local hydrogeology.

**Stephen Hinkle (USGS Hydrologist, Groundwater)**

- Kurt Carpenter and Stephen Hinkle met with the Clackamas County Soil and Water Conservation District (CCSWCD) to discuss the need for CCSWCD to characterize the occurrence and source of nitrate in groundwater near South Needy Road. The scope of the work appeared ideal for a Senior Thesis, and Carpenter and Hinkle contacted Dr. Robert B. Perkins (PSU) to inquire about his interest in this project. Perkins and student Courtney Savoie undertook the project. Carpenter and Hinkle provided data, environmental background, and project guidance.
- Stephen met with Dr. Robert B. Perkins (PSU) to discuss current understanding and knowledge gaps regarding arsenic contamination in Oregon groundwater. Provided guidance to Perkins in his endeavors to obtain funding for research into mechanisms of arsenic mobilization and fate in Oregon groundwater.

**Richard Hollway (USGS Computer Scientist):**

- Darius Respini-Irwin graduated with a Mechanical Engineering B.S. in December 2010 and was converted from SCEP to full-time permanent.
- We continue to collaborate with Ed Zaron and others at PSU by providing licensing for the Delft3D modeling package.

**Mackenzie Keith (USGS SCEP-Student, Hydrology–PSU M.S. Candidate, Geology):**

- Interactions with Andrew Fountain (Geology), Justin Ohlschlager (student, Geology), and Robert Bean (student, Geography) regarding USGS/thesis related topics.



**Valerie Kelly (USGS Surface Water Hydrologist)**

- Taught ESM 410/510 Ecology of Fish Conservation, winter term 2011, via an Intergovernmental Personnel Agreement (OF 69) with the School of the Environment for \$5,000. The class included a total of 27 students, with 7 graduate students and 20 undergraduate seniors, for 4 credits.



**Karl Lee (USGS Surface-Water Hydrologist):**

Collaboration with PSU community:

- Karl gave a guest lecture during a graduate course in Water Resource Management.

**Greg Lind (USGS SCEP Hydrologic Technician and PSU BS student)**

- BS degree expected December 2012

**Kathy McCarthy (USGS Contaminant Hydrologist)**

Collaboration with Elise Granek (Environmental Sciences and Resources):

- Collaborator/contributor on a grant submitted to the Oregon Watershed Enhancement Board for funding: "Monitoring Oregon coastal marine habitats to examine linkages to watersheds and upstream land use."

Collaboration with PSU Students:

- Provided students the opportunity to practice their oral thesis presentations/defenses and offered critical feedback.

**Jennifer Morace (USGS Hydrologist)**

- Jennifer gave a presentation on February 23, 2011, entitled "Reconnaissance Investigation of Emerging Contaminants in Wastewater-Treatment-Plant Effluent and Storm water Runoff in the Columbia River Basin" to the ESM 221: Applied Environmental Studies class taught by Val Brenneis.

**Elena Nilsen (Former USGS Mendenhall Post-Doc/Research Chemist)**

Collaboration with Elise Granek (Environmental Science and Management):

- Elena is collaborating with Professor Granek, acting as 'Senior Personnel' on a SeaGrant

proposal entitled: Impacts of watershed-based contaminants on marine species and coastal communities.

Collaboration with Jim Pankow (Chemistry and Engineering)

- ORWSC researchers are working with Professor Jim Pankow (PSU) and researchers and managers from Clean Water Services, Oregon Association of Clean Water Agencies, and ODEQ to (1) identify key factors determining the presence of Senate Bill 737 P3 contaminants of concern in wastewater effluent, (2) predict treatment fates of classes of compounds and test those predictions, and (3) expand understanding of upstream sources of P3 compounds, thereby improving pollution prevention program effectiveness.

Collaboration with Ben Perkins (Geology)

- Elena and Ben Perkins (Geology) have discussed potential collaborations on historical organic/inorganic sediment geochemistry projects and instrument sharing.

**Jim O'Connor (USGS Hydrologist/ Quaternary Geomorphologist/Geologist and PSU adjunct):**

Collaboration with Andrew Fountain (Geology);

- Student Tessa Harden; Geology Ph.D; Black Hills Paleoflood project
- Student Mackenzie Keith; Geology M.S.; Marmot Dam removal studies.
- Student Charles Cannon; Geology M.S.; Lower Columbia River estuary mapping
- Student Justin Ohlschlager; Geology M.S.; Three Sisters glacier mapping
- Team member on NSF funded Portland State University project at the Long-term Ecological Research site in the McMurdo Dry Valleys, Antarctica; with Andrew Fountain and Joseph Levy, Dept. Geology, Portland

State University. December 2010 and ongoing.

- Joint research with Andrew Fountain assessing historical glacier change in the Three Sisters Wilderness Area, Oregon. August 2010 and ongoing.



Collaboration with Virginia Butler (Anthropology)

- Klamath Basin geology and archeology
- Student Daniel Gilmore; Anthropology M.S.; Willamette Valley geoarcheology

Collaboration with Scott Burns (Geology)

- Led field trip and authored field trip guide with Scott Burns, Geology, for the 2010 Annual Meeting of the Geological Society of America. October 2010.

Presentations and information sharing:

- Presented PSU Geology Seminar “On the Leading Edge—Early Pacific Northwest Ex-

ploration and the Roots of American Fluvialism” January 2010

- Presentation on linkages between geology and archaeology to PSU student archaeology group. March 2010
- Meeting with Scott Burns, Steve Sobieszczyk, and other ORWSC staff on Santiam River turbidity and landslide studies. May 2010
- Willamette Valley site visit with Daniel Gilmore, Virginia Butler, Anthropology. September 2010
- Columbia River Valley site visit with Scott Burns, Geology. October 2010
- Meeting with Andrew Fountain and Joshua Heard (Geology) regarding glacier mapping in Goat Rocks Wilderness Area. February 2011

Broader scientific community interactions involving PSU faculty and students:

- Established informal “Newberry Club,” a venue for monthly presentations and discussions on a variety of topics regarding geomorphology and Quaternary geology for Portland-area researchers. Convened at PSU January 2011
- Member of Local Area Committee (with Scott Burns and Andrew Fountain, Geology, PSU) for the 2010 Annual Meeting of the Geological Society of America. January 2009 through October 2011.
- On management board (with Scott Burns, Geology, PSU) of the Quaternary Geology and Geomorphology Division of the Geological Society of America. October 2010 and ongoing.

### **Jackie Olson (USGS Cartographer)**

- Classroom lecture/demonstration of Illustrator techniques for Geog. 380 Class, Dr. Joe Poracsky.
- Developed handout on animation methods for Geog. 380 Class.
- Classroom lecture/demonstration of Illustrator techniques for Geog. 380 Class.

### **John Risley (USGS Hydrologist, Groundwater)**

Oral presentations:

- “Impact of Groundwater Pumping vs. a Large Upstream Dam on Streamflows and Temperature under Varying Climate” by John Risley, presented at: Hydrology 514 class, Prof. Heejun Chang, PSU Dept. of Geography, October 12, 2010
- “Developing environmental flows for the McKenzie River Basin” by John Risley, presented at: North-America Hydrology for the Environment, Life, and Policy (HELP) Workshop, May 10-12, 2010, University Place Hotel, Portland State University, invited by Prof. Heejun Chang, PSU Dept. of Geography. (<http://iowacedarbasin.org/wp-content/uploads/2010/05/HELP-Workshop-Agenda-andCalendar-20100510.pdf>)

Poster presentation:

- “Watershed Scale Response to Climate Change: Sprague River Basin, Oregon” by John Risley, Lauren E. Hay, and Steven L. Markstrom, presented at: Pacific Northwest Oregon Climate Science Conference, June 15–16, 2010, co-sponsored by Portland State University, session moderator: Prof. Andrew Fountain, PSU Dept. of Geology. <http://occri.net/news-and-events/pnw-climate-science-conference-june-2010>

Formal reviews of manuscripts authored by PSU professors and graduated students:

- “Assessment of Climate Change Impact on Hydrologic Ecotones” by Ruben, G. Baird, Hamid Moradkhani, and Susan Wherry, PSU Dept. of Civil Engineering, paper submitted to Journal of Hydrology
- Surface-water chapter in Oregon Climate Assessment Report, “3.4. Projected future changes in surface water hydrology” by Heejun Chang and I.W. Jung, PSU Dept. of Geography written for Oregon Climate Change Research Institute
- “What is responsible for the late summer streamflow decline in Oregon” by H. Chang, I.W. Jung, M. Steele, and M. Gannett, paper submitted to ‘Geographical Analysis’

### **Stewart Rounds (USGS Hydrologist, Water-Quality Modeling)**

Collaboration with Scott Wells (Civil Engineering):

- Stewart has worked with Scott Wells to think about ways to improve algorithms for simulating dam operations with the CE-QUAL-W2 model. Future collaborations will include discussions on how to improve the simulation of pH by that model.
- Scott Wells has provided technical reviews of USGS reports on water-quality modeling.

Collaboration with Elise Granek (ESM)

- Stewart remains the USGS contact for the sharing of, and training in the use of, the USGS freeze-drier (lyophilizer). Several PSU students in Elise Granek’s group have used the freeze-drier.

Collaboration with Jim Pankow (Chemistry and Civil Engineering)

- Stewart Rounds and Elena Nilsen worked with Jim Pankow to develop a research proposal focusing on the presence and removal of Priority Persistent Pollutants from Oregon wastewater treatment plants. As part of that

process, Stewart and Elena also worked with students and staff associated with Pankow's group.

#### Collaboration with Steve Greenwood (Hatfield School of Government)

- Stewart Rounds and Rose Wallick have begun discussions with Steve Greenwood on the topic of a coordinated monitoring program for the Willamette River Basin. Steve is working with the Meyer Memorial Trust on this issue, and is interested in getting USGS involved in a group that assesses the monitoring needs and opportunities to coordinate monitoring activities across a broad coalition of groups.

#### Collaboration with PSU community:

- Stewart acted as a judge at the NorthWest Science Expo, the regional science fair for middle- and high-school students administered through the PSU Center for Science Education. USGS sponsors an award at the science fair for the best projects demonstrating the use of water-quality principles by a middle-school student.
- As coordinators of the USGS brown-bag seminar series for 2010-2011, Stewart and Erick Burns facilitated many interactions between USGS and PSU. The USGS seminars have been well attended by PSU faculty, staff, and students. PSU faculty also participated as speakers for the seminar series.
- Stewart and Erick Burns helped to create a joint USGS/PSU/OSU Research Colloquium Series for the spring quarter of 2011. Internationally distinguished scientists from around the world are scheduled to speak in the seminar series, with talks scheduled both in Corvallis at OSU and in Portland at PSU. It is hoped that this will become an annual phenomenon, and it will facilitate much cross-pollination between USGS and PSU because it will bring USGS staff into contact with many faculty, staff, and students from PSU on a weekly basis.

- Stewart continues to work with the PSU Student Watershed Research Program (SWRP). Each year, Stewart and Bernie Bonn teach the chemistry lectures on one day of a four-day teacher training workshop. They also taught an evening session for teachers on the subject of project design and elementary statistics. Stewart also judges at the annual SWRP Summit where students present the results of their environmental monitoring work.

#### **Ken Skach (USGS Computer Specialist and programmer)**

- Ken is registered for spring term, 2011, for the course, OMSE 511 Software Project Management, in the Oregon Masters of Software Engineering program. The OMSE program appears to be a good enhancement to Ken's programming work on USGS database-related applications. If this course is successful, Ken hopes to take several OMSE courses.

#### **Daniel T. Snyder (USGS Hydrologist - Groundwater)**

- Dan assisted Dr. Virginia L. Butler, Professor, PSU Department of Anthropology, with registration for the 2010 Klamath Basin Science Conference organized by the ORWSC and other USGS offices. She presented a poster titled "Using Archaeological Fish Remains to Determine Species of Anadromous Salmon and Trout in the Upper Klamath Basin before Hydropower Development." This and subsequent presentations she has made on this subject has drawn considerable interest as it has a large bearing for the current activities related to salmonid restoration in the Klamath Basin.
- Dan also assisted Dr. Michael L. Cummings, Professor, PSU Department of Geology, with registration for same conference. He presented a poster titled "Hydrogeologic Relations in the Williamson River Sub-basin of the Upper

Klamath Basin, Oregon.” This subject is of importance to the current activities of the USGS and other agencies as it relates to the management of water resources in the Klamath Basin.

- Scott Waibel, Graduate Student, PSU Department of Geology, has been assisting Dan on the Columbia Plateau Regional Aquifer System Groundwater Availability Study for the past year. His work on the Status and Trends Task has earned him co-authorship on one of the reports currently in preparation
- Karl Lee and Dan Snyder assisted Angus Leger, Graduate Student, PSU Department of Geology, with the procedures for barometric correction of water levels in wells measured using pressure transducers. The wells are being used in monitoring of the City of Portland's Columbia South Shore Well Field.

#### **Steve Sobieszczyk (USGS Hydrologist, Groundwater)**

- Aided Heejun Chang (Geography) with proposal to Oregon Department of Transportation (ODOT) concerning impacts of climate change on increased risk of landslide failure and its affect on commuter congestion due to road closures.
- Discussed project work with Geoffrey Duh (Geography) concerning remote sensing techniques for determining a vegetative index and canopy fuel load for riparian areas in Fanno Creek.
- Discussed potential report topics and cooperative funding sources with Scott Burns (Geology).
- Discussed carbon sequestration and carbon production from leaf litter with Ben Perkins (Geology).
- Worked with Rick Hugo (Geology) on proposal for development of Outreach position in the Geology Department

Academic (Student):

- Completed M.S. Degree in December 2010 at PSU (Geology). Committee: Scott Burns, Ben Perkins (Geology), Geoffrey Duh (Geography)

Academic (Adjunct):

- Taught "GIS for Water Resources - GEOG 4/594" (Geography) for Spring 2011

#### **Adam Stonewall (USGS Surface Water Hydrologist)**

Collaboration with PSU faculty:

- Reviewed a paper by PSU professor Hamid Moradkhani titled "Impact of climate change on streamflow and soil moisture in Vermilion basin, Illinois, USA" The paper was submitted to the Journal of Hydrologic Engineering.
- Met with PSU professor Heejun Chang and committee members of the Johnson Creek watershed council to discuss his water quality research in the area on Feb. 8, 2011.

Collaboration with PSU community:

- Coordinated with USGS employee/ PSU grad student Ryan Cole, who taught a GIS lab in the Geography Department during the fall term of 2010.

#### **Whitney Temple (USGS Hydrologist)**

- Whitney (PSU, M.S. ESM,) began as a volunteer in January 2010, and was hired as a temporary employee in April 2010. She made the connection to the Center through Eric Burns, who was teaching a geology class at PSU. Whitney is now a term employee and works with the Columbia Basin Studies group.
- Whitney assisted with the revision of the National Hydrologic Dataset. She is an integral member of the National Water-Quality Assessment (NAWQA) Program's sampling team collecting nutrient and pesticide sam-

ples from the Willamette River and its tributaries. She leads the field effort of a study to quantify primary productivity at four sites on the Columbia River. Whitney authored a USGS Scientific Investigations Report describing the occurrence of pesticides in the Hood River Basin.



been a tremendous asset to the work at USGS.



**Jim Tesoriero (USGS Research Chemist)**

- Jim gave a talk titled: "Nitrogen Contamination of Surficial Aquifers: A Growing Legacy" at PSU Environmental Science Seminar Series on April 30th, 2010.

**Mark Uhrich (USGS Hydrologist, Water Quality)**

Collaboration with PSU students:

- Mark worked with volunteer student Jasna Kolasinas from the Civil Engineering Department regarding time-of-flow studies for basins in Oregon using the software Riverspill, as part of ICWater (Incident Command Tool for Protecting Drinking Water). Jasna checked her results with older USGS time-of-flow studies done in 1968 and 1995. Jasna is considering a student project using her result from ICWater, along with inundation studies using GIS. Jasna also helped in tabulating and computing turbidity and suspended-sediment concentration data for the Toutle River Basin, off Mount St. Helens. Jasna has volunteered over 600 hours and has

**Ian Waite (USGS Biologist and PSU Adjunct)**

- Ian and Kurt Carpenter collaborate regularly with Dr. Yangdong Pan (Environmental Science). They often share information and knowledge of statistical techniques and software. Ian is also on one of Dr. Pan’s Ph.D students committee and is advising this student on macroinvertebrate research.
- Ian also team teaches a PSU Environmental Science Department class on benthic invertebrates.

**Dan Wise (USGS Hydrologist, Water Quality)**

Collaboration with PSU community:

- On May 14, 2010 Dan gave a presentation on the Pacific Northwest SPARROW model to an advanced GIS class at PSU.

Collaboration with PSU students:

- Esther Duggan (B.S., Geology, PSU) graduated and was retained at the ORWSC on a

hydrologic field assistant appointment. Esther was the ORWSC lead for the revision of the Pacific Northwest region of the National Hydrologic Dataset. She has helped develop geospatial data sets for input into a regional watershed model (SPARROW) and is the lead person for one of these data sets (suitable cattle grazing land in the Pacific Northwest).

- Esther helped on projects in the field, specifically with water-quality sampling and bed sediment analysis. She also compiled a bibliography for a study of primary productivity in the lower Columbia River.
- Dan had volunteer help from two PSU geography students, Richa Jain and Gabe Winfrey. Richa and Gabe developed a GIS procedure for allocating livestock waste to the landscape. This procedure was modified to develop geospatial data sets for input into a regional watershed model (SPARROW).

#### **Collaborative publications (PSU affiliation in bold)**

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**Harden, T.**, O'Connor, J.E. and Driscoll, D.G., 2010, Paleoflood history of Rapid Creek in the foothills of the Black Hills, South Dakota. Geological Society of America Abstracts with Programs, v. 42, no. 3, abstr. 14-8.

**Harden, T.**, O'Connor, J., and Driscoll, D.G., 2010, Improving flood-frequency estimates for the Black Hills, South Dakota, using slackwater flood deposits in caves and alcoves. Geological Society of America Abstracts with Programs, v. 42, no. 5, p. 226.

Jones, K.L., O'Connor, J.E., Wallick, R., Anderson, S., **Keith, M.K.**, and Mangano, J.R., 2010, Bed-material, channel stability and regional gravel production dynamics in Oregon coastal rivers. 2010 Fall Meeting, American Geophysical Union, San Francisco, December 13–17, 2010, abstr. EP31A-0726.

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O'Connor, J.E., and **Burns, S.F.**, 2009, Columbia cataclysms and controversy—Aspects of the geomorphology of the Columbia River Gorge, in O'Connor, J.E., Dorsey, R.J., and Madin, I.P., eds., *Volcanoes to Vineyards: Geological Field Trips through the Dynamic Landscape of the Pacific Northwest: Geological Society of America Field Guide 15*: p. 237–251, doi: 10.1130/2009.fld015(12).

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of watershed scale response to climate change in selected basins across the United States: Earth Interactions.

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