



WASHINGTON STATE DEPARTMENT OF
Natural Resources
Doug Sutherland - Commissioner of Public Lands

DGER NEWS

DIVISION OF GEOLOGY AND EARTH RESOURCES
"Washington State's Geological Survey since 1890"

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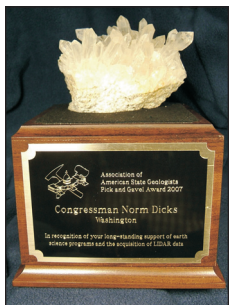
PICK AND GAVEL AWARD PRESENTED TO CONGRESSMAN NORM DICKS

Washington State Congressman Norm Dicks (Democrat, 6th District) is the winner of the 2007 Pick and Gavel Award. The award is given by the Association of American State Geologists (AASG) to recognize individuals who have made significant contributions to advancing the role of geoscience in the public policy arena. State Geologist Ron Teissere made a formal presentation of the award on March 6 at the Cosmos Club in Washington, DC. Pete Modaff, Legislative Director for the Congressman, accepted the award on behalf of Congressman Dicks (Fig. 1). The next day Teissere met with Congressman Dicks in his office and presented the award to him personally (Fig. 2).

The image etched into the award symbolizes its meaning:

- The Geologist's Pick, a trademark of the geological profession;
- The Gavel, representing the deliberative process of government;
- The Nation's Capitol, where the two come together in formulating national public policy.

A mounted, one-of-a-kind mineral, fossil, or rock symbolizing the Earth completes the symbolism of the award. The Pick and Gavel Award presented to Congressman Dicks



displays a world-class specimen of quartz and pyrite from the Spruce 16 claim in the Cascade Range. Crystals from the Spruce claim appear in prestigious collections all over the world. The mineral specimen was donated to AASG by Bob Jackson (Fig. 3), who owns and operates the mine. (See sidebar.)

Congressman Norm Dicks was chosen for the Pick and Gavel Award because of his enthusiastic support of geoscience and his encouragement of partnerships between state, local, and federal government that have resulted in new techniques and new interpretations.

In 1999, Congressman Dicks met with local Kitsap County representatives and the USGS to brainstorm about new discoveries in science that would help us understand the challenging issues of salmon habitat and earthquake fault studies. At that time, no one could have guessed the huge effect on public safety and environmental planning those meetings would generate. With the Congressman's support, a pilot project was developed to show the utility of using lidar. A unique federal-local partnership, the Puget Sound Lidar Consortium (<http://pugetsoundlidar.ess.washington.edu/>) was born a few months later, and in November of 1999, the consortium issued its first request for proposals for lidar data acquisition in Kitsap County. The PSLC has been used as a model to start the Portland Lidar Consortium.

There are many lasting results from the lidar data already acquired, but perhaps none is more important than the identification of active faults in the Puget Lowland. Before lidar, documenting faults in the Puget Sound area was so difficult that geologists had been able to find only one exposure, near Price Lake on the Olympic Peninsula, that suggested recent movement. Since the first data were collected in 2000, geologists have



Figure 1. State Geologist Ron Teissere makes a formal presentation of the Pick and Gavel Award to Pete Modaff, who accepts it on behalf of Congressman Dicks.

documented at least 12 active faults in greater Puget Sound area and developed improved assessments of seismic hazards. The revised assessments have resulted in the adoption of new building codes to improve the disaster resistance of communities in these areas.

The Spruce 16 claim is located in breccia pipes that are part of a mineralized zone in granodiorite of the Snoqualmie batholith. Copper deposits were first discovered along the Middle Fork Snoqualmie River in 1907.

Most of the mineralized zones in the Snoqualmie batholith had been identified by 1937. After World War II, low-grade porphyry copper deposits were being put into production. In Washington, these developments focused on the Middle Fork Snoqualmie River.

The Spruce 16 claim pyrite-quartz locality has been known to local collectors since the mid-1950s. However, it wasn't until 1977 that an Ohio-based company began rescuing museum-quality mineral specimens from the copper mine with the permission of the owner, the United Cascade Mining Company. Bob Jackson purchased the Spruce 16 claim in 1983 and has worked the mine every year since then. As a result of Jackson's work, most major mineral collections contain specimens from the Spruce 16 claim (Lasmanis, 1991).



Figure 2. Ron Teissere personally delivers the award to Congressman Dicks in his office.



Figure 3. Bob Jackson, owner of the Spruce 16 claim, inspects a mineralized outcrop at an undisclosed location.

Apart from the uses in earthquake hazards studies, a rich collection of projects and investigations is underway using the data from the PSLC, including:

- Building elevation models needed for tsunami hazard assessments

- Mapping landslides
- Identifying landforms for geologic mapping
- Designing surface mine reclamation projects
- Viewing and measuring vegetation
- Planning more environmentally friendly timber sales and road construction
- Developing GIS tools for stormwater runoff management
- Searching for a lost historical site at the mouth of the Columbia River

Thus, by any measure, the pilot lidar project Congressman Dicks began back in 2000 has been a success. The Puget Sound Lidar Consortium stands as a national model of federal-local collaboration and partnership. The consortium is routinely

invited to speak at national workshops designed to develop strategies for wide-area data acquisition of lidar.

Reference

Lasmanis, Raymond, 1991, Minerals of the Spruce 16 claim, King County, Washington: Rocks and Minerals, v. 66, no. 4, p. 316-320. ■

DGER JOB OPENING

Geologic Hazards Scientist 2—Supports the assessment of seismic and tsunami hazards by the Division. Includes assessment of liquefaction susceptibility and ground failure potential in areas subject to tsunami inundation and preparation of databases and maps depicting these hazards. For more information, see <http://www.dnr.wa.gov/jobs/default.shtml>.

SURFACE MINES IN WASHINGTON—WHO REGULATES WHAT?

The world as we know it couldn't exist without mines. There would be no roads and high-rise buildings. There would be no pots and pans. No cars and computers.

As necessary as mines are, they face a major obstacle: nobody wants a mine in their backyard, especially an open gravel pit accompanied by dust, industrial clamor, busy truck traffic, and a gaping hole in the landscape.

The resulting regulation of this complicated economic and environmental issue has created frequent confusion, not only with the miners, but also with the government agencies that monitor them.

The Washington Department of Natural Resources (DNR) plays a significant role in regulation of Washington's 1100 mines.

Under the state's 1971 Surface Mining Act, the DNR was responsible for regulating all mining operations and subsequent reclamation efforts. But under the more comprehensive 1993 Surface Mine Reclamation Act and the Metal Mining and Milling Act, DNR's role narrowed to issuing permits and regulating reclamation. DGER's role in the regulation of surface mines is explained at <http://www.dnr.wa.gov/geology/minerecl.htm>.

Network of Agencies Responsible

With the passage of the 1993 mining law, the state legislature faced the growing conflict, with the state's booming population stretching to rural areas where gravel pits once operated in seclusion. DNR, the Department of Ecology (DOE), county governments, and some cities regulate mines. Other agencies can be involved in peripheral aspects of mine operation, such as the Department of Labor and Industries' oversight of mine safety.

Under the current mining law, the responsibilities are divided as follows:

- County and city governments issue permits for location and daily operation
- DOE issues permits for water quality and water resources
- DOE and local clean-air agencies regulate air quality
- Department of Natural Resources issues reclamation permits
- The State Environmental Policy Act (SEPA) environmental review process analyzes the cumulative impacts of all mining-related permits



Figure 1. The Bullfrog pit near Roslyn, Kittitas Co. has been reclaimed as part of Suncadia Resort Community (<http://www.suncadia.com/>), which offers fishing, hiking, mountain golf, and other amenities. Top photo: Working face prior to reclamation was linear and steep. Bottom photo: Reclaimed slope after grading is sinuous and generally has a slope of 2:1 or less.



Geology-Related Bills Passed. Governor Christine Gregoire signs House Bill 2129 into law on May 4, 2007, as State Geologist Ron Teissere looks on. The bill regulates requirements for geothermal drilling, including a permit, record-keeping, and plugging of the abandoned hole. Other geology-related bills signed at the same time include SSB 5972, which provides the Department of Natural Resources with more consistent enforcement authority for protection against mining without a permit, and SB 5445, which authorizes oil and gas regulatory-cost reimbursements. These bills go into effect on July 22, 2007. The complete text of the bills may be viewed at <http://apps.leg.wa.gov/billinfo/summary.aspx?> ■

Under the law, DNR examines the permits of every mine in the state to assure that adequate plans are made for reclamation. (The law defines ‘mines’ as larger than 3 acres of disturbed ground and/or a high wall higher than 30 feet and steeper than 45°.)

Mining Still a Contentious Issue

Mining remains a contentious issue as the public and mine operators try to navigate through the network of government agencies and the current requirements. “Most miners are conscientious business people who want a viable business with a good reputation,” said mine inspector Chris Johnson.

There is confusion over which agency is regulating which requirement. Who makes determinations? Who should hear the complaints or answer questions?

“Local governments regulate mine operations—including blasting, grading, noise, and traffic. DOE monitors water quality and water resources and, in some counties without a clean-air agency, air quality. DNR inspects mines to make sure they are following their reclamation plan,” Chris said.

In another common misunderstanding of government roles, buyers of new homes are upset over the close proximity of their housing development to an established mine with 100- to 200-foot cliffs.

“Mines are long-term operations,” Chris said. “One quarry in Clark County has been operating for more than 100 years. Mines are expected to last at least 50 years.”

The Growth Management Act encourages local governments to preserve these much-needed resources by locating housing developments far enough away from active mines, through proper zoning and setbacks, that they may peacefully coexist until the mine is exhausted.

Material for Infrastructure

Washington’s most common mines are gravel surface mines that yield gravel, sand, and rock—not coal mines, which are regulated by the federal government.

“Washington has outstripped itself. The state needs to build infrastructure, such as roads and buildings,” Chris said. “It needs rock. So the delicate balance is to allow surface mines near enough to urban areas to keep down the hauling costs.”

Another little-known fact is that the state’s own Department of Transportation operates more mines—for building roads—than any other mining operation. “Whenever

possible, DNR’s inspectors work with officials of other agencies to provide seamless monitoring and regulation,” Chris said.

What Constitutes Reclamation?

A surface mine drastically and permanently alters a landscape’s soil and topography. Mine owners are not required to ‘fill in’ a completed mine, which would be economically prohibitive.

“The word ‘reclamation’ doesn’t imply ‘restoration,’” said Chris. “You could never return an area back to its natural and original condition. In nearly all cases, a large hole is left. Our job is to make sure that it has stable slopes, and the land is returned to a beneficial second use.”

Plans may call for a golf course (Fig. 1) or a business park. Old mining sites have been converted to excellent fishing lakes, which can be used for recreation or wildlife habitat. But gravel pits are not merely filled with water to make a lake. They are modified with variable depths and meandering shorelines to approximate the terrain of natural lakes to maximize habitat.

To ease public tensions over a mine operation, many operators ‘segment’ their mines into multiple phases of excavation and reclaiming (Fig. 2). Each section is treated like a separate mine: mined and reclaimed before another section begins. This keeps mined areas small with reclamation ongoing at the same time, rather than sustaining a large pit.

ROCK CREEK LANDSLIDE UPDATE

The scarp of the Rock Creek landslide near Stevenson, Wash., continues to move upslope toward a second house. There was increased activity the weekend of May 19 (Figs. 1-2). Material flowed into Rock Creek from across the face of the slide, making the creek a slurry on Saturday. The new activity



Figure 1. View from Angel Heights showing the newly activated area(s), which are located outside the footprint of the previously reported slide. This new area is from just left of center to the right edge. Most of this dropped on Saturday morning (May 19), with continued activity all weekend. The charred remains of the LaCombe house can be seen at the top of the scarp.



Figure 2. This sand and gravel mine operation near DuPont is using the preferred ‘segmental reclamation’ technique, which begins rehabilitation phases (at left) long before the total mining ends. The active part of the mine is at the right.

Living with Surface Mines

Chris believes that many gravel pit problems can be solved through county zoning ordinances. DNR can help with this process by providing mapping and GIS data.

“Counties need accurate maps which locate mineral resources and show where they need to dig for minerals. Proper zoning will help protect other resources and home buyers from the problems of living near a quarry.” ■

DAMAGE TO OUR NATIONAL PARKS

If you’re planning a visit to one of our national parks this summer, check out this *Tacoma News Tribune* article detailing the status of your favorite trails, roads and campgrounds after the November 2006 storm: <http://www.thenewstribune.com/multimedia/parkstorm/index.html>.

was mainly due to destabilization of the toe of the slide by the action of Rock Creek.

To prevent the original endangered (LaCombe) house from sliding intact into the canyon, local fire fighters did a controlled burn of the house on May 12. All that is left is the metal siding. ■



Figure 2. Looking northwest from the yard of the currently endangered house toward the charred remains (mostly metal siding) of the LaCombe house and garage. Some of the metal is still there; some went down throughout the weekend. The closest crack to the home now at risk is about 15 feet away. Photos taken May 22 by Larry Douglass, Skamania Co. Public Works Dept.

STAFF NOTES

Trevor Contreras joined the DGER staff in March as a Natural Resources Scientist 2. He is working in the Hazards Section on liquefaction susceptibility mapping and will be doing field work this summer with Ray Cakir on five strong-motion sites in Western Washington. They will be using downhole and shear-wave studies to characterize the geology of Pacific Northwest Seismic Network sites. Trevor got his B.S. in geology from the University of Oregon in 1998 and his M.S. (geophysics and hydrogeology) from the U of O in 2004. After getting his bachelors, he worked for the Oregon Department of Transportation logging geotechnical borings and instrumenting landslides. He worked for the Washington Department of Ecology for 2½ years regulating well construction before joining DNR.



Ben Stanton joined the DGER staff in April as a Natural Resources Scientist 2. So far, he has worked with Joe Dragovich assembling a geologic map showing the entire Darrington-Devils Mountain Fault Zone. This summer, he will assist Josh Logan on mapping the Maytown 7.5-minute quadrangle. He will also be working with Joe on the Glacier Peak lahar story. Ben received his B.S. in geology with an environmental concentration from Western Washington University in 2002. Before coming to DNR, he worked for Hart Crowser in Seattle for almost 4 years.



Geological Society of America (GSA)

Several DGER staff presented papers and posters at the Geological Society of America Cordilleran Section annual meeting at Western Washington University in Bellingham, May 4–6. Open file reports will be on the DGER website at http://www.dnr.wa.gov/geology/pubs/pubs_ol.htm.

DINOSAUR EXHIBIT AT PACIFIC SCIENCE CENTER

'Colossal Fossils', a new dinosaur exhibit, runs through Jan. 6, 2008, at the Pacific Science Center in Seattle (<http://www.pacsci.org/colossal/fossils/>). The exhibit combines current research with prehistoric artifacts to create an educational and fun experience for all ages! Search for bones in one of the dig pits! Feel the immense power of their size as you walk among real dinosaur skeletons from across China!

Discover the beginnings of these giant creatures in the dinosaur egg and embryo exhibit. Also featured is an awesome new 3D IMAX film, 'Dinosaurs Alive!'. ■

Posters with asterisks can be seen at <ftp://198.187.3.44/geology/posters/>:

- Should we regulate active faults? (AEG workshop) *by Kathy Goetz Troost and Timothy J. Walsh*
- Extending and expanding the stratigraphy of the Puget Lowland (poster) *by Timothy J. Walsh and Robert L. Logan*
- A prototype 2007 seismic design category map for residential construction in the State of Washington (poster)* *by Recep Cakir, Timothy J. Walsh, and Isabelle Y. Sarikhan*
- Morphology of the Alderwood landslide: A probable origin for tsunami in Lynch Cove, Puget Sound, Washington (poster) *by Isabelle Y. Sarikhan, Timothy J. Walsh, and Recep Cakir*
- Recognition of non-rule identified high hazard landforms identified during Landslide Hazard Zonation Project Mapping in Washington State (poster)* *by Carol F. Serdar*
- Results of trenching the Canyon River fault, southeast Olympic Mountains, Washington (poster) *by Timothy J. Walsh and Robert L. Logan* (Open File Report 2007-1)
- The Darrington-Devils Mountain fault—A probably active reverse oblique slip fault zone in Skagit and Island Counties, Washington (poster) *by Joe D. Dragovich* (Open File Report 2007-2)
- New 1:24,000-scale geologic maps and age control for southwestern Whidbey Island—From Greenback to Double Bluff, Island Co., WA (poster) *by Michael Polenz, Henry Schasse, and Bradley Peterson* (Wash. Dept. of Transportation)
- Use of radiocarbon dating and dendrochronology to investigate a possible submerged forest in Eld Inlet—A teacher-researcher partnership (poster)* *by Jo Martens (Centralia High School), Patrick T. Pringle (Centralia College), and Michael Polenz*

Digital Mapping Techniques '07

Chuck Caruthers, Anne Heintz, and Karen Meyers of our Publications/Data Section attended the May 20–23 Digital Mapping Techniques '07 conference in Columbia, South Carolina. They presented a poster entitled "Compilation and production of the 1:500,000-scale geologic map of Washington State, and some aspects of 1:24,000-scale map production at the Washington Division of Geology and Earth Resources", by J. Eric Schuster, Charles G. Caruthers, Anne C. Heintz, and Karen D. Meyers (<ftp://198.187.3.44/geology/posters/>). The conference is sponsored by the Association of American State Geologists and the U.S. Geological Survey. It is an invitation-only event designed to bring together scientists, cartographers, and GIS specialists, primarily from State and Federal agencies, who are using digital techniques to create and manage geologic maps. For more information, see <http://ngmdb.usgs.gov/Info/dmt/>.

Washington State GIS Conference

Anne Heintz, Belle Sarikhan, and Chuck Caruthers gave a PowerPoint presentation at the 2007

Washington State GIS Conference on April 24 in Lynnwood. The presentation was entitled "The Washington State Geologic Survey and the Rocky Road to Geologic Maps" (<ftp://198.187.3.44/geology/posters/>). Anne covered general information, Belle talked about hazard maps, and Chuck described the construction of the special symbols that we use that are not in the USGS symbol set.

Sponsored by the Washington State Chapter of the Urban and Regional Information Systems Association (WAURISA), the conference is designed to help GIS (geographic information system) professionals learn from their colleagues, network with their peers, and build a solid GIS foundation for their career, company, or agency. For more information, visit <http://www.waurisa.org/>.

World Affairs Council Tour

Assistant State Geologists Dave Norman and John Bromley were asked by the World Affairs Council (WAC) to escort 14 visitors from the Peoples Republic of China to some of our local surface mines on May 24. The group is here to check out "Mineral Resources Management in the U.S." as part of the WAC's International Visitor Program. They toured the DuPont sand and gravel mine (see Fig. 2, p. 3), 12 miles northwest of Olympia, with Jim Tweedy, plant manager for Glacier Northwest, which owns the mine. It is the largest source of aggregates for the Seattle-Tacoma area and is the largest sand-and-gravel operation in the U.S.



The group was also taken to the Steilacoom pit, which is no longer active, to view mine reclamation in progress. The Steilacoom pit is being reclaimed as a golf course and other mixed uses. Pierce County planner Rachel Couch was also along.

The tour group stopped in Hawaii for several days before coming to Washington. After their visit here, they continued on to the East Coast. ■



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