The Geological Newsletter

"News of the Geological Society of the Oregon Country"

Volume 77, Number 1
January/February 2011

The Geological Society of the Oregon Country
P.O. Box 907, Portland, OR 97207-0907
www.gsoc.org
2010 - 2011 Administration:
President:
Larry Purchase – 360/254-5635
lkpurchase@q.com
Vice-President:
Rik Smoody - 360/546-2019
science@smoo.com
Secretary
Beverly Vogt – 503/292-6939
bevvogt@comcast.net
Treasurer
Richard Bartels − 503/292-6939
bartbartels@comcast.net
Directors:
Dave Olcott (1 year) – 503/695-5219
Anne O'Neill (2 years) - 503/477-7827
Paul Edison-Lahm (3 years) – 971/404-6064
edisonlahm@comcast.net

Past Presidents:
Carol Hasenberg – 503/522-4249
csh727@comcast.net
Janet Rasmussen − 541/753-0774
jkayerocks@yahoo.com
Newsletter Editor and Calendar:
Carol Hasenberg – 503/522-4249
csh727@comcast.net
Website:
Janet Rasmussen − 541/753-0774
jkayerocks@yahoo.com
Business Manager:
Jan Kem − 503/246-2275
jankem5@msn.com
Assistant Business Manager:
Anne O'Neill - 503/477-7827

VISITORS WELCOME AT ALL MEETINGS

CALENDAR

January/February Activities

Friday evening talk, January 14, 2011, at 7:30 p.m., in Room S17, Cramer Hall, 1721 SW Broadway Ave. (between Montgomery and Mill Sts.), Portland State University: Speaker Joseph Cohen, amateur geologist and intellectual-property lawyer at Stoel Rives LLP, in Portland, Oregon, will present "Searles Lake, California – A Mineralogical Gem".

Searles Lake is a dry lake in southeastern California. It contains some unusual collectible minerals, and is an important source of evaporite minerals for industrial use. This talk will cover (a) the geologic and human history of Searles Lake, (b) the Searles Lake minerals, and (c) a short Searles Lake field trip in October for the Searles Lake Gem & Mineral Society "Gem-O-Rama".

Join GSOC members at **Pizzicato Pizza, 1708 SW 6th Ave.**, at **6:00 p.m.** before the lecture for an informal dinner and conversation.

Ammonite place card assembly party for the upcoming GSOC Annual Banquet is scheduled for 10 a.m. on January 15. Bev Vogt will email location and directions to members of the GSOC Board of Directors. Please contact her (preferably by email) if you are interested in attending.

Friday evening talk, February 18, 2011, at 7:30 p.m., in Room S17, Cramer Hall, 1721 SW Broadway Ave. (between Montgomery and Mill Sts.), Portland State University: Speaker Daina Hardisty, Geology Instructor, Mt. Hood Community College, will present a lecture on groundwater. *Note that the date has been changed from the usual second Friday of the month due to a conflict with the Fossil Fest in Newport. Please check the website and the February calendar on updates to the date, topic, and other information about this talk.*

Free parking is available at Portland State University **Friday** nights after 5 p.m. and **Wednesday** nights after 7 p.m. in Parking Structure 2 on Broadway Ave. directly across from Cramer Hall and on level one of Parking Structure 1, bounded by Broadway and 6th Aves. and Harrison and Hall Sts.

Future Activities

The Seventy-sixth Annual GSOC Banquet is coming up on Sunday, March 13, 2011, at the Monarch Hotel in Clackamas, Oregon. Speaker Jay Van Tassel of Eastern Oregon University will present "Bulldozer Paleontology: New Ice Age Fossils from the Grande Ronde Valley, NE Oregon." The registration flyer for the event will be sent with the February edition of the *The Geological Calendar*.

Check the GSOC website (www.gsoc.org) for updates to the calendar, including information on the upcoming meetings and the GSOC 76th Annual Banquet in March.

UPCOMING ACTIVITIES FROM OTHER ORGANIZATIONS

Fossil Fest, tentatively scheduled for February 12, 2001, Hatfield Marine Science Center, Newport, Oregon. Speakers will discuss Oregon's geology and Oregon fossils. Several GSOC members are attending this because it is so interesting. Check the GSOC website or February calendar for more information.

Portland State University Geology Department Geology Winter Colloquium 2011, Cramer Hall S17, 3:30-4:30 p.m.. All are invited to attend! For information contact: Scott Burns, 503/725-3389, burnss@pdx.edu, or refer to the department website: http://geology.pdx.edu/

As of this publication, the lecture schedules have not been announced but do check the department website near the beginning of January for the upcoming lectures. Do check the times and locations also as they may have changed.

Oregon State University Department of Geosciences 2011 Winter Seminar Series, Thursdays, 4:00 pm, Gilfillan Auditorium, unless otherwise noted. Refer to department website for more information: http://www.geo.oregonstate.edu/Seminars

As of this publication, the lecture schedules have not been announced but do check the department website near the beginning of January for the upcoming lectures. Do check the times and locations also as they may have changed.

University of Oregon Department of Geological Sciences, Winter 2011 Weekly Seminar Series, Wednesdays, 4:00 to 5:20 pm in 110 Willamette Hall. Tea and cookies are served in Cascade 200 beginning at 3:30 p.m.. Refer to department website for more information: http://www.uoregon.edu/~dogsci/news/about

As of this publication, the lecture schedules have not been announced but do check the department website near the beginning of January for the upcoming lectures. Do check the times and locations also as they may have changed.

USGS Winter 2011 Seminar Series Schedule - Oregon Water Science Center
Brown Bag Seminars (http://or.water.usgs.gov/brownbag/) are held on Tuesdays from noon to 1 pm. unless noted otherwise. The seminars are informal and are open to the public. Bring your lunch. The USGS Oregon Water Science Center office is located in Portland at 2130 SW 5th Ave. Directions to the USGS office are posted at http://or.water.usgs.gov/location.html.

- January 11, "Our Vanishing Glaciers: 100 Years of Glacier Retreat in the Three Sisters Area, Central Oregon Cascade Range", Jim O'Connor, Research Hydrologist, USGS Oregon Water Science Center
- January 18, "Climate Change Impacts on Snow, Glaciers and Water Resources in the Pacific Northwest", Anne Nolin, Associate Professor, Dept. of Geosiences, Oregon State University
- January 25, "Donner and Blitzen River: Streamflow and Physical Habitat", Tim Hardin, Instream Flow Specialist, Oregon Department of Fish and Wildlife
- February 1, "Estimates of Coastal Freshwater Runoff: How to Get Them and What To Do With Them", Dave Hill, Associate Professor, School of Civil and Construction Engineering, Oregon State University
- February 8, "Do We Really Understand How Evaporation Works? The Effect of Soil Salinity", Maria Dragila, Associate Professor, Dept. of Crop and Soil Science, Oregon State University

- February 15, "Computer-Based Model Calibration R&D at the U.S. Army Engineer Research and Development Center", Brian Skahill, Research Hydraulic Engineer, Watershed Systems Group, Hydrologic Systems Branch, US Army Corps of Engineers Research and Development Center
- February 22, "Reconnaissance Investigation of Emerging Contaminants in Wastewater-Treatment-Plant Effluent and Stormwater Runoff in the Columbia River Basin", Jennifer Morace, Hydrologist, USGS Oregon Water Science Center
- Friday, March 4, Noon to 1 pm, "The Pursuit of Uncertainty in Hydrologic Climate Change Impact Assessment: Improved Characterization, Quantification and Communication", Hamid Moradkhani, Assistant Professor, Department of Civil & Environmental Engineering, Portland State University
- March 8, "Geologic, Hydrogeochemical, and Water-Level Evidence for Hydrologic Compartmentalization in the Columbia River Basalt Aquifer System in the Columbia Basin GWMA", Kevin Lindsey, Senior Hydrogeologist, GSI Water Solutions, Inc., Kennewick, Washington
- March 15, "Using Turbidity Monitoring and LiDAR-Derived Imagery to Investigate Sources of Suspended Sediment in the Little North Santiam River Basin, Oregon, Winter 2009-2010", Steve Sobieszczyk, Student Hydrologist, USGS Oregon Water Science Center

OMSI Science Pub Portland

There are now TWO Science Pubs in Portland -- one at the Bagdad Theater in Southeast, and one at Mission Theater in Northwest. Learn about cutting-edge topics in science and technology from leading researchers and scientists, all while enjoying food and drinks. Experience an informal atmosphere where you can interact with experts and where there are no silly questions. No scientific background is required; just bring your curiosity, sense of humor, and appetite for food, drinks, and knowledge!
http://www.omsi.edu/sciencepubportland

- "How to Repair a Damaged Brain: From Lumps of Sugar to Spheres of Stem Cells", Monday, January 3, 2011, at the Bagdad Theater (note earlier date!). Larry Sherman, PhD, is a senior scientist at the OHSU Brain Institute. Dr. Sherman presented at two Science Pubs in 2009 on Music to Your Brain, and in 2010 as part of Brain Chemistry for Lovers. We are thrilled to have him back to present on yet another brain-related topic!
- "Cataclysms on the Columbia: The Great Missoula Floods", Tuesday, January 18, 2011, at the Mission Theater. Scott Burns, PhD, is a professor of geology and past chair of the Department of Geology at Portland State University where he has been for nearly 20 years. Scott specializes in environmental and engineering geology, geomorphology, soils, and Quaternary geology. This is a repeat of the Science Pub held at the Bagdad Theater on October 11, 2010.
- "Promiscuous DNA: The Invasion, Spread, and Impact of Mobile Genes", Tuesday, February 15, 2011, at the Mission Theater. Sarah Schaack, PhD, is a post-doctoral fellow in the biology department at Lewis & Clark College.

GSOC Membership List

GSOC members wishing to obtain a membership list call or email Secretary Beverly Vogt, and she will mail you one.

Nominating Committee Results

The following slate of officers has been selected by this year's nominating committee:

President .....Rik Smoody
Vice President..... Jane Walpole
Secretary ..... Paul Edison-Lahm
Treasurer ..... Richard Bartels
Director, 3 years .....Julia Lanning
Director, 2 years .....Dawn Juliano
Director, 1 year.....Anne O'Neill

Nominations will be closed for this year's slate of officers after the January meeting of the society. The slate of officers will be voted on and approved at the February monthly meeting.

The Nominating Committee members were Rik Smoody, Paul Edison-Lahm, Dawn Juliano, and Larry Purchase. Our thanks to the selected members and members of the Nominating Committee!

WELCOME NEW MEMBERS FOR 2011!

Whoa -- we've gotten a lot of new members this past year! You guys are awesome!

Elizabeth Brown	**Gary Cheel**
Martin Eversaul	**Richard Heinzkill**
David Keyes	**Al LePage**
Sandra Lilligren	**Rafael Maymi**
Debbie Maymi	**Virginia Ohler**
Doug Ohler	**Nancy Overpeck**
Liz Paulus	**Terry Tolan**
Jane Walpole	

BOARD MEETING NOTES

December 11, 2010

The meeting was called to order by President Larry Purchase at the home of Rosemary Kenney. Board and GSOC members present included Larry Purchase, Rik Smoody, Beverly Vogt, Richard Bartels, Janet Rasmussen, Anne O'Neill, Rosemary Kenney, Doug Rasmussen, Julia Lanning, and Antonella Mancini.

Richard Bartels gave the Treasurer's report. The Treasurer's report was approved.

Rik Smoody discussed upcoming Friday night speakers. Joe Cohen will talk about Searles Lake, CA, at the January meeting; and Daina Hardisty's topic at the February meeting will be groundwater. Larry Purchase discussed possible speakers for the March 13th Annual Banquet., with Jay Van Tassel as his first possibility. Rik Smoody said the theme of the President's Field Trip will be Aggradation, focusing on the area in Washington between the Mount St. Helens and Mount Rainier.

Because the Fossil Fest will be held again this year the day after the February Friday evening GSOC meeting, it was decided by majority vote that Rik will see if the speaker can come on a different Friday and if so will have the February Friday night meeting moved to that date (he also needs to verify that the meeting room will be available on the different date). The Board also decided that this year we will not have a table at the Fossil Fest and instead put some of our updated brochures on the NARG table, if possible.

The report of the Nominating Committee was approved. The proposed slate of officers for next year are President, Rik Smoody; Vice President, Jane Walpole; Secretary, Paul Edison-Lahm; Treasurer, Richard Bartels; Director (1st year), Julia Lanning; Director (2nd year), Dawn Juliano; Director (3rd year), Anne O'Neill.

The Christmas Party held at the Simon Benson House on Dec. 10 was discussed. Thanks to Anne O'Neill and all of the Board and other attending GSOC members, the party was a great success, with at least 45 people attending. The music was wonderful, people were having such a good time they had to be told the party was over, and the cleanup was thorough and efficient. It was decided that food arrangements next year need to be different, with fewer sweets and more cheeses, meat, salads, sandwiches, etc. We will use nametags next year, and Janet volunteered to make reusable nametags that can be hung around our necks.

Antonella discussed sales items. It was decided that items should be produced and purchased locally if possible. Board members are asked to submit ideas to Antonella about designs and what kinds of items would be good to sell by the end of the year, and she will work with other members to have some things for sale at the banquet in March.

Field trips were discussed. We want to evaluate the effectiveness of our field trip program, so next year, the field trip chair is asked to submit a report to the board after the field season and an end-of-year field trip summary for the January newsletter, telling number of people participating, money taken in and money spent, participants' comments on the trips, how many were turned away because there were too many attending, etc. Potential trips for next two years include Fossil Fest (Feb.), Portland Building Stone (Clay and Paul, April), possible flower trip to Ramona Falls (Ken Cameron in May), President's Field Trip to Washington State with Rik (sometime in summer), possible trip with Ken Cameron to augite crystals in the Tillamook Highlands (late summer), coastal tide pools and geomorphology

with Janet (this year or next year), Wallowa Lake with Janet (2012), Walla Walla Pleistocene geology with Dave (2012 possibly). NARG field trips will be listed in GSOC Newsletter when possible.

Miscellaneous: An ammonite place card assembly party is scheduled for 10 a.m. Jan. 15. Bev will email location and directions. The rock identification class has yet to be worked out. Details will be announced ASAP. It will be followed by a field trip with Larry to quarry to see what we have learned.

The next meeting is scheduled for 10 a.m., February 19, at Larry's house. If there are any changes to the time or place, Bev will notify by email. She will also send out directions to meeting place with agenda by email.

Respectfully submitted,
Beverly Vogt, Secretary

NEW BOOK CORNER

Stores in Stone, by David B. Williams, 2009, Walker Publishing Co., Inc., New York, 260 p., hardcover.
Review by Dr. Paul Hammond:

This is a great book. Very well written and most interesting. I strongly recommend it to anyone with an interest in geology and building stones. The author describes individual stones by chapter:

- The brownstone (sandstone) of New York City and New England, called the Portland Formation, about 220 to 195 Ma, late Jurassic-earliest Jurassic, geologic information, p. 8-9;
- The dark-colored, alkali-rich Quincy granite, about 450 Ma, late Ordovician, of the Boston area, geologic information, p. 38-40;
- The granite boulders in conglomerate derived from the Salinia terrane, 80 Ma to 3 billion years old, near Carmel, California, which Robinson Jeffers used in his construction of Tor House and Hawk Tower, geologic information, p. 62-65;
- Morton gneiss, of Morton, Minnesota, 3.5 billion years old, of Archean and Hadean age (pre-Cambrian), geologic information, p. 70-71, 76-84;
- Coquina, a rock composed of sea shells, used in the early America construction of the (fort) Castillo de San Marcos, St. Augustine, Florida, derived from the Anastasia Formation, 100,000 years old, geologic information, p. 102-105;
- Salem limestone, Bloomington, Indiana, 330 Ma, during the Mississippian Period, geologic information, p. 115-120;
- Petrified wood, age unknown, from an area about 25 miles south of Lamar, Colorado, used in the construction of a Lamar gas station, geologic information, p. 141-143;
- Carrara marble, Michelangelo's favorite rock for sculpturing, 200 Ma, earliest Jurassic, geologic information, p. 162-163, 167-169, 171-173;
- Slate, metamorphosed deep-water mud, eastern USA, 540 to 420 Ma, early Paleozoic, Cambrian to Silurian, geologic information, p. 183-186; and
- Italian travertine, a sedimentary rock rich in calcite and related mineral aragonite, deposited adjacent to hot springs, geologic information, p. 202-204.

In each chapter Williams describes the stone, how it was formed, where it was first noted as a building stone, how it is quarried—in considerable detail the Morton gneiss, Salem limestone, and Carrara marble—or obtained, the history of the quarrying operation, and where the stone is most prominently displayed, in an interesting, amusing way integrating the information, leading from one topic to the next. At the end the book has a good glossary of chiefly geologic terms, p. 227-231, and a lengthy list of notes by chapter, p. 233-250; and an index, p. 251-260.

Comments from two reviewers:
"This is the best sort of book, one that makes you see the familiar in a strange new light. Now that David Williams has warmed our stone façades with beautifully told stories, never again will I pass a brownstone without looking for telltale flaws or walk the Granite City without thinking of the natural wonders that produced it stony poetry."—by Jennifer Ackerman.

"By assigning human stories and values to stone in the fascinating book, David B. Williams links the living and nonliving. In the process, our homes and buildings come alive."—Robert M. Thorson.

Mapping for Disasters

Synopsis of the October 8, 2010 GSOC Friday night lecture by Don Pettit, Senior Emergency Response Planner, Emergency Response Program, Oregon Department of Environmental Quality
by Carol S. Hasenberg

Don Pettit works in a group of seven Oregon Department of Environmental Quality (DEQ) employees that respond to state of Oregon disasters, and he discussed his work and his group's mapping projects with GSOC this past October. The group's primary responsibility in disaster response is to determine what to do with the debris and hazardous material which is generated by the event. Their group partners with many other state agencies, such as Oregon Public Health, Oregon Fire Marshal (OSFM), Oregon Department of Transportation (ODOT), Oregon State Police (OSP) and Oregon Emergency Management (OEM) and each group is responsible for specific tasks in a state disaster.

You might be surprised to learn that Don's background is in geology and wonder why an agency like DEQ would hire a geologist to lead a team of emergency responders. Pettit thinks that he is perfect for the job, because his training and experience are wide ranging, as a geologist he is used to cobbling together what limited relevant data is available to make a decision on, and most importantly, in an environmental disaster having knowledge of the physical setting is very important to assessing the risk and determining the best course of action.

This last point explains why Pettit's group has embarked on a mapping quest for Oregon emergency managers. In conjunction with their Oregon disaster response partners, the DEQ has been assembling layers of mapped data in order to have the best information about a site as quickly as possible. This project is known as IRIS, and the maps are assembled on a GIS computer mapping platform. So far the group has assembled 150 mapped sets of data, starting the general mapping data for Oregon that has been available for some time on the state's Geospatial Data Clearinghouse.

This mapping project is a monumental task, as well as being time-sensitive. Map data has been produced in a variety of dates, quality, and scales, and Pettit's group has the task of determining the most accurate data sets and correcting and updating those they can. The group has outlined the qualities that the emergency map product must have:
It should be

- Dynamic, so maps can be modified to show different content at different scales and obtain a readable product
- It must be able to support queries, in other words isolate or highlight data points which have certain attributes or spatial relations
- It must be portable so it can be used on a laptop computer at a disaster site
- It must be simple enough for anyone on the team to be able to use
- It must be able to stand alone, without internet access
- And it must be difficult for a user to "mess with" or "screw up"

Key datasets to the product include maps of water supplies, locations of hazardous materials, and DEQ permitted sites for hazardous materials. The DEQ has been hiring Oregon university geography students to produce some of the needed mapping. Datasets produced this way include a river mile dataset for Oregon rivers and converting navigational charts to GIS format.

Pettit showed the GSOC audience some examples of the maps he has in the datasets. It was a real eye opener to see a map of the incidents of leaking home oil tanks in the Portland area. There are also maps for the pipelines carrying hazardous liquids in the area. Moving to the coast, Pettit showed navigational information on Tillamook Bay and a dataset in progress showing potential oil boom sites for oil spill incidents. One of the most interesting and important datasets was a map of the Portland well fields showing well locations and contours of travel times for surface spills to the wells. Another important set of layers shows the jurisdictional

boundaries of various state, federal, and private agencies with contact information so disaster responders can quickly assemble a team of affected parties during an event.

Pettit demonstrated the power of having this data by pointing out how easy it is to see on a spatial format where problems are most likely to occur and gaps in the coverage exist. For example, he showed how one responder jurisdictional boundary, which reached from the Oregon coast to the Bend area, was too big to expect reasonable response time. A map of the hazardous material spills in the last ten years showed a strong correlation to the locations of major highways throughout the state. Looking at the incident statistics it is no surprise that over 60% are petroleum spills on the highways.

Although Pettit's group is small, he thinks they have done a good job in getting needed information assembled and will continue to add to their data sets. Being well informed will help our state efficiently cope with upcoming events.

THE GEOLOGICAL NEWSLETTER INDEX

Volume 76, 2010
compiled by Carol Hasenberg

Geological Society of the Oregon Country Activities:

ANNUAL EVENTS: President's Field Trip—Summer or Fall; Banquet—March; Annual Business Meeting—February.
FIELD TRIPS: About 4 per year. Fees: see field trip announcements on the calendar next page.
GSOC LIBRARY: Rm. 69, Cramer Hall, Portland State University. Open 7:00 p.m. prior to meetings.
PROGRAMS: Second Friday evening most months, 7:30 p.m., Rm. S17, Cramer Hall, PSU, SW Broadway at SW Mill St., Portland, Oregon.
MEMBERSHIP: Per year from January 1: Individual--$25, Family--$35, Junior (under 18)/Student--$15. Membership applications are available on the website www.gsoc.org.
PUBLICATIONS: THE GEOLOGICAL NEWSLETTER (ISSN 0270 5451), published monthly and mailed to each member. Subscriptions available to libraries and organizations only at $20.00 per year. Single Copies are available at $2.00 each. Order from:
Geological Society of the Oregon Country, P.O. Box 907, Portland, Oregon 97207
TRIP LOGS: Write to the same address for names and price list.

APPLICATION FOR MEMBERSHIP
THE GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Name_____ **Spouse**_____

Children under age 18_____

Address _____ **City** _____ **State** ___ **Zip**_____-_____

Phone (_____**)**_____-_____ **Email address**_____

Geologic Interests and Hobbies_____

_____

Please indicate Membership type and include check for appropriate amount:

Individual $25.00 _____ **Family $35.00** _____ **Student $15.00** _____

Make Check Payable to: **The Geological Society of the Oregon Country**
PO Box 907
Portland, OR 97207-0907

THE GEOLOGICAL NEWSLETTER

"NEWS OF THE GEOLOGICAL SOCIETY OF THE OREGON COUNTRY"

VOLUME 77, NUMBER 2
MARCH/APRIL 2011

The Geological Society of the Oregon Country
P.O. Box 907, Portland, OR 97207-0907
www.gsoc.org
2010 - 2011 Administration:
President:
Rik Smoody - 360/546-2019
science@smoo.com
Vice-President:
Jane Walpole – 503/590-7501
antjane@aol.com
Secretary
Paul Edison-Lahm – 971/404-6064
edisonlahm@comcast.net
Treasurer
Richard Bartels − 503/292-6939
bartbartels@comcast.net
Directors:
Anne O'Neill (1 year) - 503/477-7827
a.oneill@yahoo.com
Dawn Juliano (2 years) - 503/367-7708
dawnmj_2000@yahoo.com
Julia Lanning (3 years) – 503/201-8022
julia@julialanning.com

Past Presidents:
Larry Purchase – 360/254-5635
lkpurchase@q.com
Carol Hasenberg – 503/522-4249
csh727@comcast.net
Newsletter Editor and Calendar:
Carol Hasenberg – 503/522-4249
csh727@comcast.net
Website:
Janet Rasmussen − 541/753-0774
jkayerocks@yahoo.com
Business Manager:
Jan Kem − 503/246-2275
jankem5@msn.com
Assistant Business Manager:
Anne O'Neill - 503/477-7827
a.oneill@yahoo.com
Field Trip Committee Chair
Dave Olcott– 503/695-5219
daveolcott46@yahoo.com

VISITORS WELCOME AT ALL MEETINGS

CALENDAR

MARCH/APRIL ACTIVITIES

The Seventy-sixth GSOC Annual Banquet will be held on Sunday, March 13, 2011, at the Monarch Hotel in Clackamas, Oregon. Speaker Jay Van Tassel of Eastern Oregon University will present "Bulldozer Paleontology: New Ice Age Fossils from the Grande Ronde Valley, NE Oregon." The registration flyer for the event can be found in the February edition of the *The Geological Calendar* or on the website (www.gsoc.org). Deadline for receipt of registration forms is Monday, March 7, 2011.

There will be no Friday night meeting in March due to the Annual Banquet.

Friday evening talk, April 8, 2011, at 7:30 p.m., in Room S17, Cramer Hall, 1721 SW Broadway Ave. (between Montgomery and Mill Sts.), Portland State University. Speaker Courtney Cloyd, retired, former Senior Geologist for Geologic Hazards and Geologic Resources, US Forest Service, will present "The Paleontological Resources Preservation 'Act' and Amateur Fossil Collecting".

The talk will include an overview of how the Paleontological Resources Preservation subtitle (in the 2009 Omnibus Public Land Management Act) will guide management of fossils on Federal lands, and what it means for amateur paleontologists and collectors. Cloyd is a native Oregonian and graduate of the University of Oregon. He's a registered professional geologist in Oregon and Washington, and recently retired after thirty-five years as a geologist with the US Forest Service.

Join GSOC members at **Pizzicato Pizza, 1708 SW 6th Ave.**, at **6:00 p.m.** before the lecture for an informal dinner and conversation.

Free parking is available at Portland State University **Friday** nights after 5 p.m. and **Wednesday** nights after 7 p.m. in Parking Structure 2 on Broadway Ave. directly across from Cramer Hall and on level one of Parking Structure 1, bounded by Broadway and 6th Aves. and Harrison and Hall Sts.

Future Activities

Friday evening talk, May 13, 2011, at 7:30 p.m., in Room S17, Cramer Hall, 1721 SW Broadway Ave. (between Montgomery and Mill Sts.), Portland State University. Speaker Charlie Hammond, Senior Associate at Cornforth Consultants, Inc., with 23 years of engineering geology experience, will present "Giant Paleo-Landslides of the Tyee Formation near Eddyville, Oregon Coast Range: Complex Geologic History from LIDAR and Radiocarbon".

Giant paleo-landslides have been uncovered at the US Highway 20 construction project between Corvallis and Newport, Oregon, in the turbidite beds of the Tyee Formation. Geotechnical models for landslide evaluations have been developed based on the LIDAR, subsurface explorations, construction outcrops, and radiocarbon testing. The process of predicting the landslide boundaries (head scarps, toes, lateral and basal shear zones) for the stability analysis models has revealed details of their geologic history. The oldest slides are not readily visible; that is, most of their geomorphology has been removed or masked by surficial processes. They appear to have been giant translational-block slides that are controlled by bedding, high-angle fault zones and paleo-topography. Erosion has divided some of the giants into multiple landslides, and the landforms also reflect multiple episodes of sliding.

Field Trip to Columbia Basin and Eastern Washington

May 20-22, 2011- GSOC member and Field Trip Chair Dave Olcott is arranging a three day trip based in **Kennewick, Washington** to study Columbia River Basalts, Ice Age Flood features, and their impact on this area. Day 1 of the trip will include a car caravan featuring stops along the Columbia River and in the Walla Walla Valley. Kevin Lindsey, Senior Hydrogeologist at GSI Water Solutions, Inc., with the assistance from members of the Walla Walla Watershed Alliance, will address surface and groundwater issues in the above valley. *Note that Lindsey will also give a lecture in the USGS Winter Seminar Series in Portland on March 8 – see page 13.* Days 2 and 3 will be van-based tours guided by Terry Tolan and Steve Reidel, both Senior Hydrogeologists at GSI Water Solutions, Inc., and experts on Columbia River Basalt.

Anticipated fee for the trip will be $65 and will include the trip packet, van transportation on days 2 and 3 only, and speaker honoraria. All other expenses and arrangements will be the responsibility of the participants. There will be both camping and hotel options in the area for the participants, and early reservations for campsites is advised. Since the van spots will be limited, interested parties are also advised to get on the participant list soon. A registration form for the trip will be available in the April edition of *The GSOC Calendar* and on the website. If you have questions or wish to reserve a participant spot at this time email Dave at daveolcott46@yahoo.com or call (503) 695 - 5219.

NOTE: You must be a GSOC member or guest of a member to attend GSOC field trips. You may join GSOC at any time, for $25.

Check the GSOC website (www.gsoc.org) for updates to the calendar, including information on the upcoming meetings and the GSOC 76th Annual Banquet in March.

UPCOMING ACTIVITIES FROM OTHER ORGANIZATIONS

Portland State University Geology Department Geology Winter Colloquium 2011, Cramer Hall S17, 3:30-4:30 p.m.. All are invited to attend! For information contact: Scott Burns, 503/725-3389, burnss@pdx.edu, or refer to the department website: http://geology.pdx.edu/

This Winter Term PSU is only offering seminars for the School for the Environment and for Geospatial Technology. Please refer to the geology department website for links to these seminars.

As of this publication, the lecture schedules have not been announced for the Spring seminars. Do check the department website near the beginning of April for the upcoming lectures. Do check the times and locations also as they may have changed.

Oregon State University Department of Geosciences 2011 Winter Seminar Series, Thursdays, 4:00 pm, Gilfillan Auditorium, unless otherwise noted. Refer to department website for more information: http://www.geo.oregonstate.edu/node/524

Seminar topic for Winter 2011 is "Blast from the Past!"

- March 3 – Sharon Kelly, HDR Engineering, "Adventures in Transportation Planning in Portland"

As of this publication, the lecture schedules have not been announced for the Spring seminars. Do check the department website near the beginning of April for the upcoming lectures. Do check the times and locations also as they may have changed.

University of Oregon Department of Geological Sciences, Winter 2011 Weekly Seminar Series, Wednesdays, 4:00 to 5:20 pm in 110 Willamette Hall. Tea and cookies are served in Cascade 200 beginning at 3:30 p.m.. Refer to department website for more information:
http://www.uoregon.edu/~dogsci/news/about

- March 2 - Chris Bell (University of Texas), "Assumption of a strict modern analog clouds our understanding of the paleoecology of the Pleistocene"
- March 9 - John Platt (University of Southern California), "Alboran domain collapse and the Ronda peridotite"

As of this publication, the lecture schedules have not been announced for the Spring seminars. Do check the department website near the beginning of April for the upcoming lectures. Do check the times and locations also as they may have changed.

USGS Winter 2011 Seminar Series Schedule - Oregon Water Science Center
Brown Bag Seminars (http://or.water.usgs.gov/brownbag/) are held on Tuesdays from noon to 1 pm. unless noted otherwise. The seminars are informal and are open to the public. Bring your lunch. The USGS Oregon Water Science Center office is located in Portland at 2130 SW 5th Ave. Directions to the USGS office are posted at http://or.water.usgs.gov/location.html.

- Friday, March 4, Noon to 1 pm, "The Pursuit of Uncertainty in Hydrologic Climate Change Impact Assessment: Improved Characterization, Quantification and Communication", Hamid Moradkhani, Assistant Professor, Department of Civil & Environmental Engineering, Portland State University
- March 8, "Geologic, Hydrogeochemical, and Water-Level Evidence for Hydrologic Compartmentalization in the Columbia River Basalt Aquifer System in the Columbia Basin GWMA", Kevin Lindsey, Senior Hydrogeologist, GSI Water Solutions, Inc., Kennewick, Washington
- March 15, "Preferential Flow and Contaminant Transport to Public Water Supply Wells: Lessons from NAWQA TANC", Rick Johnson, Professor, Oregon Health & Science University, Beaverton, OR

OMSI Science Pub Portland
There are now TWO Science Pubs in Portland -- one at the Bagdad Theater in Southeast, and one at Mission Theater in Northwest. Learn about cutting-edge topics in science and technology from leading researchers and scientists, all while enjoying food and drinks. Experience an informal atmosphere where you can interact with experts and where there are no silly questions. No scientific background is required; just bring your curiosity, sense of humor, and appetite for food, drinks, and knowledge!

- Monday, March 7, 2011 - 7:00pm, "Expedition Titanic 2010: Return to the Deep", Portland - Bagdad Theater, P.H. Nargeolet, director of Underwater Research for RMS Titanic, Inc., is widely acknowledged as the leading authority on the Titanic wreck site.
- Tuesday, March 15, 2011 - 7:00pm, "Friends or Foes? Facing the Facts about American Crows", Portland - Mission Theater, Dr. David P. Craig, associate professor and chair of the Department of Biology at Willamette University.
- Monday, April 4, 2011 - 7:00pm, "Why Everyone (Else) Is a Hypocrite", Portland - Bagdad Theater, Robert Kurzban, PhD, author of the book Why Everyone (Else) Is a Hypocrite, and associate professor in the Psychology Department at the University of Pennsylvania. He founded PLEEP, the Penn Laboratory for Experimental Evolutionary Psychology, in 2003.

Check the OMSI Science Pub website for updates to the lectures. http://www.omsi.edu/sciencepubportland

GSOC Dues are Past Due

If you haven't sent in your GSOC dues please do so right away! Dues were due on January 1, 2011. If you joined the society after September 1, you don't have to renew your membership dues until next year. See page 18 for membership dues schedule.

GSOC members wishing to obtain a membership list call or email Secretary Beverly Vogt, and she will mail you one.

New Slate of Officers

The following slate of officers has been approved by the society at its annual February meeting:

President .....Rik Smoody
Vice President..... Jane Walpole
Secretary ..... Paul Edison-Lahm
Treasurer ..... Richard Bartels
Director, 3 years .....Julia Lanning
Director, 2 years .....Dawn Juliano
Director, 1 year.....Anne O'Neill

Welcome new officers!

BOARD MEETING NOTES

February 19, 2011

The meeting was called to order by President Larry Purchase at the home of Wenonah and Larry Purchase. Board and GSOC members present included Larry Purchase, Rik Smoody, Beverly Vogt, Richard 'Bart' Bartels, Dave Olcott, Janet Rasmussen, Carol Hasenberg, Tara Schoffstall, Rosemary Kenney, Doug Rasmussen, Dawn Juliano, Jane Walpole, Julia Lanning, Antonella Mancini, and Wenonah Purchase. The minutes of the December 11, 2010, meeting were approved.

Treasurer's report was given by Bart and was approved.

Report on **future Friday night lectures** was given by Jane Walpole. Charlie Hammond will speak in May, and Jane is hoping to get Courtney Cloyd from the Forest Service to speak in April on fossil collecting regulations on Federal lands. Janet reported on the Fossil Fest at Newport. It was very successful, with approx. 12 GSOC members attending.

Plans for the March Annual Banquet were discussed. Thirty people have already sent in their money. Janet will prepare a draft of the program and circulate it among Board members for corrections and suggestions. Bart will send Janet all the new names he receives. Extra ammonites can be used for table decorations or something else if suggested. Rosemary will bring the collection of old place cards as a display, and Bev and Bart will make arrangements to pick them up from the GSOC storeroom at PSU for Rosemary. Jan Kem will handle the sales table of books, field trip guides, maps, etc, and donations are requested (no rocks please). Larry will prepare a display of posters for the Friday night talks.

Tara and Antonella will research a new local place to **order mugs and T-shirts**, and Janet and Carol will act as consultants on design and plans for the new order. They are requested to report their findings and suggestions at the next meeting.

Dave presented his plans, estimated costs, lodging possibilities, and insurance issues for his May 20-22 **field trip to eastern Washington to look at classic Columbia River Basalt and Missoula Flood** localities, including rental of two vans for days 2 and 3. Information for the registration form has to be in to Carol by March 20 for the newsletter, with itinerary details to her ASAP. Dave estimated costs at $60/person, but after going over the figures suggested cost be raised to $65/person. Registration form should include cell phone numbers for all field trips, and leaders should prepare a list of participants' cell phone numbers for all participants. Janet is working on her June 17-19 field trip to the coast, and she is requested to have her details for the registration form to Carol by April 20, with other information to Carol ASAP. Rik will have his President's Trip in August and is asked to get his information to Carol by June 20. Paul Edison-Lahm's Portland building stone trip could be held in the fall—or in July if he prefers. Clay has offered to work with Paul if needed. Information about that trip has to be given to Carol so she can get it into the newsletter at the appropriate time.

Bart will have his **class on rock and mineral identification** in May, probably on a Saturday, at the Vogt/Bartels' house and will announce information when available. Bart is preparing written material and will have lots of specimens to study. The class will probably take most of the day, so we can figure out lunch arrangements at the house. Because of space limitations, this first class will be open to Board members only but may be offered again to other GSOC members.

Next meeting will be at 10 a.m., April 9th, at Rosemary Kenney's house.

Beverly F. Vogt, GSOC Secretary

Editor's Note: We'd love to thank Beverly Vogt for all her hard work as secretary and quite a few other important contributions to the society. Three cheers Bev!

NEW BOOK CORNER

by Dr. Paul Hammond

Brian Switer, writing in the Wall Street Journal, issue Saturday-Sunday, January 22-23, 2011, section D, page 9, in an article entitled "Rock Of Ages," reviews a most intriguing book, **The Planet in a Pebble**, Oxford, 256 pages, $27.95, by Jan Zalasiewicz, a Welsh geologist. Author Zalasiewicz describes an ordinary polished stone, supposedly picked from the Welsh coast, and describes it in considerable detail—its origin, its mineral content and composition, and history. The reviewer, Brian Switer, concludes with the paragraph, "Although the records contained within the pebble are often incomplete and are not always preserved in high fidelity, they still allow us to feel the rhythms of planetary change. In some ways the pebble is like one of the new computer chips, tightly packed with more information than one could ever surmise from gazing on its smooth surface."

Switer, a research associate at the New Jersey State Museum is also credited with a fine book, **Written in Stone: Evolution, the Fossil Record, and Our Place in Nature**.

Searles Lake Story

Synopsis of the January 14, 2011 GSOC Friday night lecture by Joseph Cohen, GSOC member and intellectual-property lawyer at Stoel Rives LLP, in Portland, Oregon
by Carol Hasenberg

To kick off the new year, GSOC traveled south to the California Basin and Range country listening to the talk by GSOC member Joseph Cohen. The topic of the lecture is an important producer of industrial minerals and geological curiosities, Searles Lake. Located southwest of Death Valley and south of Mt. Whitney and Owens Valley, Searles Lake is part of a series of basins which stair-step their way down from the Sierra Nevada mountains to the low point in Death Valley. From highest to lowest the basins are Owens, Indian Wells, Searles, Panamint, and Death Valley. During the recent series of Ice Ages beginning about 100,000 years ago, snowmelt produced a series of lakes in these basins that occasionally spilt over into the next lower basin. Searles Basin was the low point for a large lake that included Indian Wells Basin and itself, and so it collected a large amount of salts and minerals. Alternating layers of salt and mud built up on the bottom of the lake during periods of quiet and overflow. Today the basin is surface dry but the briny layers under the surface are mined for a plethora of minerals.

Searles Lake basin is a treasure trove of evaporite minerals, including trona, borax, halite, hanksite, sulfohalite, potash, searlesite, calcite, and many more. Salt-loving extremophilic bacteria live in the brine and add a beautiful pink color to the halite crystals that form in the brine. Any water that accumulates in the basin is very toxic and has a high pH. The concentration of salt is so intense that it will kill birds that unwittingly land in it. Trona pinnacles which are tens of feet high created by precipitation in the lakes history stick up in twisted shapes that give the landscape an alien quality.

European settlers in the region recognized the economic potential of the area. In the 1870's the Searles Brothers discovered that mining borax here was more profitable than mining gold in California. They developed a 20-mule train system which would carry the borax to the port of San Pedro. Since this time the Searles Lake area has been owned and worked by various mining operations. Today the parent company which owns the mine is an Indian Corporation. Their borax brand is called Three Elephant but the origin of the name is American, not Indian. The name is a play on the idea of a 20-mule train - three elephants must be so much more robust than the mules. The mining done today is liquid extraction – brine rich in minerals is pumped up from the lower layers and used in the manufacture of products such as detergents, glass and Pyrex.

Like many other extraction industries, the economic conditions produced by the borax mining has followed a boom and bust cycle. In its heyday in the 1950's, the nearby town of Trona was populated by some 6000 people with high employment. Royalties from the mines made this one of the richest school districts in California. The high school had 1500 students. Today the population of the town is 1500 with 100 high school students.

Geology buffs have a unique opportunity to get up close and personal with the Searles Lake treasures. Every year in early October, the lake is opened to rock hounds with field trips conducted through the Searles Lake Gem & Mineral Society. This so-named Gem-O-Rama attracts many people every year and there are several different

flavors of field trips for the mineral buffs. Joseph Cohen has attended the Gem-O-Rama and showed GSOC photos from the events and the minerals he collected.

Trips offered include the Mud, Blow Hole, and Pink Halite (aka Brine Pit) trips. As their names imply, participants are likely to get caked by mud and salt. For the mud trip, backhoes get mud from the lake and spread it over the ground the day before the trip. Big crystals of hanksite are collected from the mud by the participants. Some groups working the mud set up huge troughs of brine to wash off the mud. The brine is a lot less caustic than plain water to the crystals.

In the Blow Hole trip, navy demolition experts from the nearby China Lake Naval Air Station are hired to plant charges in the ground at 600 ft depths. These produce geysers of brine which shoot crystals all over the ground surrounding the blow holes. This trip is popular because it is a lot less muddy for the participants. The Pink Halite trip travels to areas where there are pits of brine in which large clusters of pink halite crystals grow. One has to get in the brine under the lip of the edge of the pit to collect the crystals. Oh yes, and the brine really stinks because the bacteria which color the crystals produce a sulfurous odor.

These minerals collected at the Gem-O-Rama are corroded by the humidity in the air so that collectors need to store them carefully. Cohen sprays salad oil on most of his, except for the halite which is sensitive to that. These he keeps in plastic tubs with a desiccant. Some folks also use mineral oil to preserve their crystals.

EDENTATES IN THE WILLAMETTE VALLEY

Synopsis of the February 12, 2011, Fossil Fest lecture, "Digging up the Kings Valley Groundsloth," by Dr. William Orr, Professor Emeritus and Curator of the Condon Collections, Museum of Natural and Cultural History, University of Oregon
by Carol Hasenberg

It's always a treat to attend a lecture by William Orr because he makes the audience laugh as well as giving them excellent and interesting information about his topic. Dr. Orr began his 2011 Fossil Fest lecture by asking the audience how they found out about the lecture and Fossil Fest. Many folks raised their hands when he asked them whether they found out about it on the internet, or by word of mouth, but then he said that he found out by "reading it on the bathroom wall." He then introduced his co-researcher Mike Full as the real Ice Age Mammal specialist and said that "he's the one who should be giving this talk."

He then began to discuss his recent involvement in the excavation of Ice Age ground sloth skeletons in Kings Valley, Oregon (Benton County). The setting for the fossilization of these remains is the Willamette Valley, which is tectonic, not fluvial, in origin. The Willamette Valley is a broad basin situated between the Coast Range and Cascade Range of mountains and is gradually sinking. Someday it will fill with water like the Puget Sound. It has received a lot of sediment, especially since the Ice Age Floods from Lake Missoula in Montana filled the valley on numerous occasions with backwash from those massive floods. Small offshoot valleys like Kings Valley served as refuges for large mammals during this time.

Ground sloths were common animals in the Willamette valley during the Ice Age and did not die out until 11,000 years ago. They originated in South America during the Oligocene and spread north 3 million years ago when a land bridge developed between the two previously separated continents (i.e., North and South America). This land bridged caused a great many mammalian species to intermix between the two continents. Horses, elephants, dogs, cats, and deer spread south from North America, while edentates such as anteaters, sloths and armadillos spread north from South America.

Orr cited some examples of the North American mammals which included zebra-like or ass-like horses, the huge Ice Age bison, mammoths and mastodons, Smilodon saber-toothed cats, Canis dirus (Dire wolf), and short-faced bears. Many of these were huge and dangerous predators unmatched by any we have today. The north-bound mammals from South America included the Glyptodon, a huge armadillo that resembled the dinosaur Ankylosaurus in appearance but not ancestry, the Giant Anteater, and large ground sloths. These edentates were all dangerous animals in terms of human size and strength, but were outmatched by the North American predators. Despite this disadvantage, they were able to spread and thrive until the end of the Ice Age, and may have been pushed into extinction by the spread of another super predator on the scene, i.e. human beings.

Getting back to the Kings Valley excavation, Orr described the excavation site as being an old stock pond where the land-owner had discovered some bones and

had called in the paleontological experts to sort them out. The fossils were found in a matrix of black anoxic mud and the site has to be continuously pumped to keep out the water. These conditions were pretty good at keeping vandals off the site, Orr said. The excavation team worked the site one spot at a time, removing buckets of sediment and screening them in a water tank. Using this method nothing larger than ¼" in size was missed. After describing the gooey site conditions Orr joked that his part of the excavation was to "set excavation policy." His wife Elizabeth and youngest daughter also kept the records for the excavation.

Some examples of some of the items found in the excavation included teeth, skull parts, larger bones, finger digits, claws, and dermal ossicles of at least 3 Harlan's ground sloths. The teeth of a ground sloth are hipsodont like those of a horse, cow or deer, and are characteristic of animals which feed on rough forage. They are high-crowned and gradually wear down over the life of the animal. Orr estimates that ground sloths had a life expectancy of about 10 or 12 years based on the teeth. Ground sloth teeth are also characteristically dumbbell-shaped in cross section.

The finger bones found faithfully maintained the mammalian digit formula of 2-3-3-3-3 digits per finger. The claws on the front feet were huge and caused the animal to turn in their front feet as they walked on all fours. Rear foot bones included knobby heel bones which aided the animal in rearing up on its hind legs.

The dermal ossicles are a very fascinating characteristic of ground sloths. Their skin was about 2 inches thick (they've found preserved pieces of it) and had these little bones imbedded in it shaped like rough diamonds. These little bones acted like "the metal studs in a motorcycle hoodlum's jacket" to protect the animal.

Getting back to a more general discussion of ground sloths, Orr referred to another western species, the Shasta ground sloth, which was lighter in build than the Harlan's. Back east the largest ground sloth, Megatherium, was common, and President Thomas Jefferson was known to have dug up some of their remains on his property. In fact, he warned Lewis and Clark to look out for ground sloth and elephants on their western explorations, as he did not understand that these animals were extinct. These animals all went extinct about 11-12 thousand years ago. The large herbivores preceded the large carnivores into extinction.

In fact, Orr describes the edentates in general as a "big collection of losers" – primitive herbivores who have a relatively small niche in modern day fauna. Their descendants include the armadillo, anteaters, tree sloths, and a small Asian ground sloth relative called the pangolin. This animal is distinct in being the only scaled mammal but unfortunately it has been found to be edible by humans. The edentates have been eclipsed by more efficient mammals in the competitive arena of nature.

REFERENCES AND ADDITIONAL READING

Fossil Fest 2011 Event Details, OSU Calendar includes a description of the talk:
http://calendar.oregonstate.edu/event/49143/

University of Oregon Museum of Natural and Cultural History Condon Collections site:
http://pages.uoregon.edu/mnh/Pages/condon_collections.html

Wikipedia sites:
The Xenarthra page on Wikipedia
http://en.wikipedia.org/wiki/Edentates includes anteaters, sloths, and armadillos.
The ground sloth page on Wikipedia includes info on Harlan's ground sloth:
http://en.wikipedia.org/wiki/Ground_sloth.
The Harlan's Ground Sloth page:
http://en.wikipedia.org/wiki/Paramylodon_harlani.

Return to the Ice Age: The La Brea Exploration Guide:
http://www.tarpits.org/education/guide/index.html

IN MEMORIAM

PSU Professor Gilbert Thomas Benson

The following is an excerpt of an obituary published in The Oregonian on February 6, 2011:

"Tom Benson was born in Los Angeles and moved to Portland as a child. He was the … grandson of Portland businessman and philanthropist Simon Benson. ... Tom fondly remembered camping as a Boy Scout in Tryon Creek State Park, as well as one of his first jobs working on log rafts for a local tugboat company. After attending Stanford University, Tom spent several years as a geologist for Texaco. He then earned a doctorate from Yale University and began teaching in 1962 at the University of Oregon. In 1968 he moved to Lake Oswego and spent the remainder of his career as a professor of geology at Portland State

University…Remembrances may be made to the Oregon Historical Society or Portland State University."

For the full text of the obituary see the Oregonian website:http://obits.oregonlive.com/obituaries/oregon/obituary.aspx?n=gilbert-thomas-benson&pid=148426885

Geological Society of the Oregon Country Activities:

ANNUAL EVENTS: President's Field Trip—Summer or Fall; Banquet—March; Annual Business Meeting—February.

FIELD TRIPS: About 4 per year. Fees: see field trip announcements on the calendar next page.

GSOC LIBRARY: Rm. 69, Cramer Hall, Portland State University. Open 7:00 p.m. prior to meetings.

PROGRAMS: Second Friday evening most months, 7:30 p.m., Rm. S17, Cramer Hall, PSU, SW Broadway at SW Mill St., Portland, Oregon.

MEMBERSHIP: Per year from January 1: Individual--$25, Family--$35, Junior (under 18)/Student--$15. Membership applications are available on the website www.gsoc.org.

PUBLICATIONS: THE GEOLOGICAL NEWSLETTER (ISSN 0270 5451), published monthly and mailed to each member. Subscriptions available to libraries and organizations only at $20.00 per year. Single Copies are available at $2.00 each. Order from:
Geological Society of the Oregon Country, P.O. Box 907, Portland, Oregon 97207

TRIP LOGS: Write to the same address for names and price list.

APPLICATION FOR MEMBERSHIP
THE GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Name_____ **Spouse**_____

Children under age 18_____

Address _____ **City** _____ **State** ___ **Zip**_____-_____

Phone (_____**)**_____-_____ **Email address**_____

Geologic Interests and Hobbies_____

_____

Please indicate Membership type and include check for appropriate amount:

Individual $25.00 _____ **Family $35.00** _____ **Student $15.00** _____

Make Check Payable to: **The Geological Society of the Oregon Country**
PO Box 907
Portland, OR 97207-0907

THE GEOLOGICAL NEWSLETTER

"NEWS OF THE GEOLOGICAL SOCIETY OF THE OREGON COUNTRY"

VOLUME 77, NUMBER 3
MAY/JUNE 2011

The Geological Society of the Oregon Country
P.O. Box 907, Portland, OR 97207-0907
www.gsoc.org
2010 - 2011 Administration:
President:
Rik Smoody - 360/546-2019
science@smoo.com
Vice-President:
Jane Walpole – 503/590-7501
antjane@aol.com
Secretary
Paul Edison-Lahm – 971/404-6064
edisonlahm@comcast.net
Treasurer
Richard Bartels – 503/292-6939
bartbartels@comcast.net
Directors:
Anne O'Neill (1 year) - 503/477-7827
a.oneill@yahoo.com
Dawn Juliano (2 years) - 503/367-7708
dawnmj_2000@yahoo.com
Julia Lanning (3 years) – 503/201-8022
julia@julialanning.com

Past Presidents:
Larry Purchase – 360/254-5635
lkpurchase@q.com
Carol Hasenberg – 503/522-4249
csh727@comcast.net
Newsletter Editor and Calendar:
Carol Hasenberg – 503/522-4249
csh727@comcast.net
Website:
Janet Rasmussen – 541/753-0774
jkayerocks@yahoo.com
Business Manager:
Jan Kem – 503/246-2275
jankem5@msn.com
Assistant Business Manager:
Anne O'Neill - 503/477-7827
a.oneill@yahoo.com
Field Trip Committee Chair
Dave Olcott– 503/695-5219
daveolcott46@yahoo.com

VISITORS WELCOME AT ALL MEETINGS

CALENDAR

MAY/JUNE ACTIVITIES

Friday evening talk, May 13, 2011, at 7:30 p.m., in Room S17, Cramer Hall, 1721 SW Broadway Ave. (between Montgomery and Mill Sts.), Portland State University. Speaker Charlie Hammond, Senior Associate at Cornforth Consultants, Inc., with 23 years of engineering geology experience, will present "The Eldon Mills Dam Raise".

Hammond will discuss the engineering geology associated with the raised Eldon Mills Dam on the North Fork of the Trask River between Tillamook and Gaston, Oregon. He will include a discussion on the seismic stability of the dam.

Friday evening talk, June 10, 2011, at 7:30 p.m., in Room S17, Cramer Hall, 1721 SW Broadway Ave. (between Montgomery and Mill Sts.), Portland State University. Speaker Dr. Scott Burns, Professor, Department of Geology, Portland State University, will present "Geology of the National Parks".

Join GSOC members at **Pizzicato Pizza, 1708 SW 6th Ave.**, at **6:00 p.m.** before the lecture for an informal dinner and conversation.

Free parking is available at Portland State University **Friday** nights after 5 p.m. and **Wednesday** nights after 7 p.m. in Parking Structure 2 on Broadway Ave. directly across from Cramer Hall and on level one of Parking Structure 1, bounded by Broadway and 6th Aves. and Harrison and Hall Streets.

Field Trip to Columbia Basin and Eastern Washington
May 20-22, 2011- GSOC member and Field Trip Chair Dave Olcott is arranging a three day trip based in **Kennewick, Washington** to study Columbia River Basalts, Ice Age Flood features, and their impact on this

area. Day 1 of the trip will include a car caravan featuring stops along the Columbia River and in the Walla Walla Valley. Kevin Lindsey, Senior Hydrogeologist at GSI Water Solutions, Inc., with the assistance from members of the Walla Walla Watershed Alliance, will address surface and groundwater issues in the above valley. Days 2 and 3 will be van-based tours guided by Terry Tolan and Steve Reidel, both Senior Hydrogeologists at GSI Water Solutions, Inc., and experts on Columbia River Basalt.

The fee for the trip is $70 and will include the trip packet, van transportation on days 2 and 3 only, and speaker honoraria. All other expenses and arrangements will be the responsibility of the participants. There is both camping and hotel options in the area for the participants. Since the van spots will be limited, interested parties are also advised to get on the participant list as soon as possible. A registration form for the trip was included in the April edition of *The GSOC Calendar* and is also available on the GSOC website. The deadline for the registration form is May 13, 2011. If you have questions or wish to reserve a participant spot at this time email Dave at daveolcott46@yahoo.com or call (503) 695 - 5219. Participating members should also check with Dave about the possibility of hiring caterers for their bag lunches.

NOTE: You must be a GSOC member or guest of a member to attend GSOC field trips. You may join GSOC at any time, for $25.

Field Trip to the Oregon Coast near Newport, Oregon, June 17-19, 2011 - GSOC member and Past President Janet Rasmussen is leading a three-day trip to study Oregon coastal geology and tidepools near Newport, Oregon. Trip fee of $25 includes field trip guide, meeting hall rental, insurance and speaker honoraria. All other costs and arrangements are the responsibility of the participants, including transportation, lodging, and meals. See the flyer attached to this newsletter for the registration form and itinerary.

Future Activities

There is no Friday evening lecture planned for July 2011. Instead, GSOC is tentatively planning the GSOC Annual Picnic for July 17, 2011. Details will be announced in the June calendar and the July/August issue of *The Geological Newsletter*.

Reserve the dates for upcoming GSOC summer field trips! We have two field trips in the planning stages for August 2011. On Saturday, August 6, 2011, GSOC members Clay Kelleher and Paul Edison-Lahm are planning a walking tour of the building stone found in downtown Portland. The following weekend, August 12-15, GSOC President Rik Smoody is planning the GSOC President's Field Trip, with the theme of "Examples of Aggradation Processes as a Result of Eruptions of Mt. St. Helens and Mt. Rainier". This will be a car-caravan and camping trip which will include some stops in Mt. Rainier National Park. Stay tuned to the GSOC website and the monthly GSOC calendar for news regarding these trips.

Check the GSOC website (www.gsoc.org) for updates to the calendar.

UPCOMING ACTIVITIES FROM OTHER ORGANIZATIONS

USGS Oregon Water Science Center, Spring 2011 Seminar Series presents "Climate Impacts on Freshwaters: Interdisciplinary Perspectives"

The Spring 2011 Seminar Series is a collaboration between USGS, Portland State University (PSU), and Oregon State University (OSU), building on the long-standing Spring Hydrology Seminar Series at OSU. USGS and PSU are excited to bring this series of internationally known speakers to Portland! See the USGS-OWSC website for more information: http://or.water.usgs.gov/brownbag/

The Spring Climate Seminars will be held on Thursdays, generally from noon to 1 pm on the PSU campus -- Cramer Hall, room 271, although one or two may be held at the USGS Oregon Water Science Center office. A few extra seminars are being scheduled on Tuesdays at the USGS office, and will be posted here as part of the Oregon Water Science Center (ORWSC) seminar series. Directions to the USGS office are available at http://or.water.usgs.gov/location.html.

- Thursday, May 5, Noon to 1 pm, 271 Cramer Hall, PSU Climate Series, "Glacier Change and the Future of Alpine Water Resources," Andrew Fountain, Professor of Geography and Geology, Portland State University, Portland, OR
- Thursday, May 12, Noon to 1 pm, 271 Cramer Hall, PSU Climate Series, "Water Economics and Climate Change: The California Experience," David Sunding, Professor, Department of Agricultural &

Resource Economics, University of California--Berkeley, Berkeley, CA

- Tuesday, May 17, Noon to 1 pm, USGS ORWSC Series "The Hebgen Lake Earthquake of August 17, 1959:, An Eyewitness Account," Jack Epstein, Geologist Emeritus, U.S. Geological Survey, Reston, VA
- Thursday, May 19, Noon to 1 pm, 271 Cramer Hall, PSU Climate Series, "Water Management, Knowledge and Adaptation:, Tensions, Legacies and the Next Best Thing," Maria Carmen Lemos, Associate Professor, School of Natural Resources and Environment, University of Michigan, Ann Arbor, MI
- Thursday, May 26, Noon to 1 pm, 271 Cramer Hall, PSU Climate Series, "A Superensemble of Regional Climate Model Futures," Philip Mote, Director, Oregon Climate Change Research Institute and Oregon Climate Services, College of Ocean and Atmospheric Sciences, Oregon State University, Corvallis, OR
- Thursday, June 2, Noon to 1 pm, 271 Cramer Hall, PSU Climate Series, Dooge Memorial Lecture:, "How to Solve It", A Tribute to Jim Dooge, a Pioneer in Water Systems Analysis, Philip O'Kane, Professor, College of Science, Engineering and Food Science, Department of Civil and Environmental Engineering, University College Cork, Ireland
- Tuesday, June 14, Noon to 1 pm, USGS ORWSC Series "Tree-Ring Records of River Flow and Channel Dynamics, Jonathan M. Friedman," Research Hydrologist, U.S. Geological Survey, Boulder, CO

Oregon State University Department of Geosciences 2011 Spring Seminar Series, Thursdays, 4:00 pm, in 108 Wilkinson Hall (unless noted below). Refer to department website for more information: http://www.geo.oregonstate.edu/node/524

- May 5, 2011, Hollis M. Dole Lecture in Environmental Geology, Gilfillan Auditorium, Paul Hoffman, Harvard University (emeritus) and University of Victoria, "The Diluvian glacial controversy at the inception of climate dynamics and geodynamics"
- May 6, 12:00 noon, Burt 193, Paul Hoffman, Harvard University (emeritus) and University of Victoria, "New records of strange oceans during and after Neoproterozoic Snowball Earth"
- May 12,, Carrie Whitehall, Central Washington University, "The role of the Santa Marta-Bucaramanga fault system in the tectonic evolution of the Maracaibo microplate, northern South America"
- May 19, Ellen Morris Bishop, Columbia Gorge Community College, "Building a stairway in the Ivory Tower: Engaging the public with science"
- May 26, Jonathan Fink, Portland State University, Life after Geology: "Simulating lave flows, cities and academic organizations"
- June 2, Steve Giovannoni, Microbiology, OSU, Marty Fisk, COAS, OSU, "Microbial life in the lithosphere"

University of Oregon Department of Geological Sciences, Winter 2011 Weekly Seminar Series, Wednesdays, 4:00 to 5:20 pm in 110 Willamette Hall. Tea and cookies are served in Cascade 200 beginning at 3:30 p.m.. Refer to department website for more information: http://www.uoregon.edu/~dogsci/news/about

- May 4 - Christine May (James Madison University), "At the Crossroads of Geomorphology and Ecology: Insights into River Processes and Salmon Habitat"
- May 11 - Paul Heller (University of Wyoming), "Tectonic Significance of Cryptic Laramide Gravels in the Central Rockies, USA"
- May 18 - Andrew Calvert (Volcano Science Center, USGS Menlo Park), "A Tale of Two Sisters: Unraveling the 20,000 year eruptive episode that built Middle and South Sister"
- May 25 - Ben Crosby (Idaho State University), "Transient Landscape Adjustment"
- June 1 - Steve Day (San Diego State University), "Recent Progress in physics-based prediction of earthquake shaking"

As of this publication, the lecture schedules have not been announced for the Spring seminars. Do check the department website near the beginning of April for the upcoming lectures. Do check the times and locations also as they may have changed.

OMSI Science Pub Portland

There are now TWO Science Pubs in Portland -- one at the Bagdad Theater in Southeast, and one at Mission Theater in Northwest. Learn about cutting-edge topics in science and technology from leading researchers and scientists, all while enjoying food and drinks. Experience an informal atmosphere where you can interact with experts and where there are no silly questions. No scientific background is required; just bring your curiosity, sense of humor, and appetite for food, drinks, and knowledge!

- "The Mystique of Terrior: Geology, Soils, Climate and Wines in the Northern Willamette Valley," Monday, May 2, 2011 - 7:00pm, Portland - Bagdad Theater. Scott Burns, PhD, is a professor of geology and past Chair of the Department of Geology at Portland State University, where he has been teaching for nearly 20 years. Scott specializes in environmental and engineering geology, geomorphology, soils, and Quaternary geology.
- "Seeing Things in a New Light: Infrared Imaging," Monday, June 6, 2011 - 7:00pm , Portland - Bagdad Theater. Join us to see the world in a "new light." John Lester Miller (a.k.a. Dr. Strangephoton) will give an energetic presentation on the history, phenomenology, and applications of infrared imaging. John Lester Miller has 30 years of experience in the design and development of infrared systems for astronomy, commercial applications, military, and intelligence. He has worked at Mt. Wilson and Palomar Observatories, Rockwell, NASA's Infrared Telescope Facility (on Mauna Kea), Martin Marietta, and the Research Triangle Institute and has been with FLIR Systems (headquartered in Wilsonville) for over 14 years.

Check the OMSI Science Pub website for updates to the lectures. http://www.omsi.edu/sciencepubportland

BOARD MEETING NOTES

April 9, 2011

The meeting was called to order by President Rik Smoody at the home of Rosemary Kenney. Board and GSOC members present also included Rosemary, Jane Walpole, Paul-Edison Lahm, Richard Bartels, Bev Vogt, Dawn Juliano, Julia Lanning, Larry Purchase, Carol Hasenberg, and Dave Olcott. The minutes of the February 18, 2011 annual meeting and the minutes of the February 19, 2011 board meeting were approved.

Treasurer's report was presented by Bart. The treasurer's report was approved.

Report on future Friday night lectures was given by Jane Walpole. Jane still needs suggestions for speakers for October and November. She has Charlie Hammond scheduled in May to talk about the Tyee Formation. Two speakers were suggested to talk about earthquakes and tsunamis. It was suggested that Scott Burns address his specialty — national parks — especially Crater Lake and Mr. Rainer, which could tie-in to the President's Field Trip.

Lecture publicity and poster placement was discussed. Posters should highlight free parking, free admission, and that all are invited.

Annual Picnic is tentatively scheduled for Sunday, July 17th with two possible venues being checked.

Field Trips

Neogene Floods trip, May 20-22: Dave discussed the itinerary of his upcoming field trip and asked for input on trip logistics. He suggested maximizing the ability for participants to observe and listen in relaxed frame of mind by dividing the two speakers between the two vans and using a GSI person as the driver. Also for the sake of efficiency, he suggested ordering catered sandwiches in advance. Carol reminded us that the cost of trips should include both liability insurance and a contingency amount to account for no-shows. A request was made to have at least ten extra field trips guides produced in addition to the two which Rosemary archives.

Central Oregon Coast trip, June 17th-19th. Jane will email Janet to get info on how planning for this trip is progressing.

Downtown PDX field trip: Aug 6 at 10:00 a.m. was chosen as the date and time for Clay and Paul's downtown geology field trip. Paul is interested is distributing cheap hand lenses to participants, and the use of a dome magnifier was also suggested. Trip leaders will need to use the microphone/speaker set-up in order to be heard. Bev offered to provide liability waivers. Pre-registration and a nominal fee will be required to cap attendance and defray the cost of the hand lenses. The trip registration form will be published in the July/August edition of *The Geological Newsletter*.

President's field trip is scheduled for August 12th through 14th. Rik is looking for aggradation sites in the Mt. Rainer area and will be contacting the park service around Mt. Rainer which has been difficult to contact during the off-season.

Website/Internet committee: Rik is putting together a plan to move information to a new platform

that will accommodate a wiki. Bev will be contributing an inventory of all GSOC materials.

New business: A thank you card was received from Ken Severin, who appreciated our gift of Dr. Orr's Oregon Fossils.

Sales item: The GSOC mugs are being re-designed and re-ordered. Antonella and Tara are researching this, with Janet and Carol also consulting.

Janet's birthday was celebrated at Dawn's suggestion by calling Janet's voice mail and having all members present sing "Happy Birthday!"

Next board meeting will be at Carol Hasenberg's house on June 11 at 10:00 a.m.

Meeting adjourned.

Respectfully submitted,
Paul Edison-Lahm,, GSOC Secretary

Paleo-Noir: Bone-Hunting Adventures of a Geology Professor on an Oregon Potato Farm

Synopsis of the March12, 2011 GSOC 76th Annual Banquet lecture by Dr. Jay Van Tassell, Professor of Geology, College of Arts and Sciences, Eastern Oregon University, LaGrande, Oregon
by Carol Hasenberg

It isn't pretty. It isn't the ideal venue for scientific research. But what does a geology professor do when he gets a call to see some Ice Age fossils that have been unearthed by a bulldozer? He's talking about bones. Big bones. Mammoth bones. The scene of an Ice Age mystery.

Dr. Jay Van Tassell began his lecture to the GSOC banquet crowd by describing the town of La Grande, Oregon, and the fossilized remains of Ice Age animals that have been found there in the past, including bones and teeth of Columbian Mammoths (a larger and less hairy cousin of the Wooly Mammoth) and the skull of a Harlan's Ground Sloth. The town is sited on an old eroded Pleistocene alluvial fan in the spectacular Grande Ronde Valley in northeastern Oregon. During the most recent Ice Age this part of the country was not under continental ice sheets. Instead there were local small ice caps in the nearby Wallowa and Elkhorn Mountains. The climate was also a bit cooler and wetter than it is today

These specimens of gigantic Ice Age mammals have surfaced a number of times in the recent past to Van Tassell's knowledge. There have been two finds on the Eastern Oregon University campus itself, in 1939 and 1979, and other finds around the alluvial fan area. Van Tassell told the crowd that after one of the fossil finds, a Columbian (not Wooly!) mammoth tooth, was sent to a laboratory for carbon dating, the lab ground up the entire tooth to do the test!

Back to our story of the bones. Van Tassell received a visit from a student in January 2010 who showed him a mammoth bone, and said, "I can't tell you where I found this." Their conversation was interrupted by a phone call, and the student told Van Tassell that they had found more bones and he couldn't give Van Tassell the sample. Intrigued but shut out of the discovery, Van Tassell heard snippets of the story from a friend of a friend, who showed him some pictures of two mammoth tusks and some vertebrae that were found on the site.

Van Tassell decided to look for the site of the discovery. His plan was to drive out in the Grand Ronde Valley and look for bulldozers. That morning the telephone rang and his neighbor asked him, "Do you want to go on an adventure?" This was from Jay's neighbor, who is the father of a contractor who was working on the site. Van Tassell grabbed his camera and went for a ride to the site, which was a potato farm in which some site leveling was underway. The farmer wanted to 'get rid of those things' and was willing to give them to the university, but they had to come out that day. With no time to do a proper excavation, atypical methods had to be employed to protect and transport the fragile tusks using materials the contractor had on hand. The contractor wrapped the tusks in plastic, coated them with wallboard plaster, and added reinforcing bars and fiberglass cloth for strength. Unfortunately due to the air temperature being 33°F., the fiberglass did not set up. The tusks were then brought in to the university on the back of a pickup, and when the fiberglass and plaster were removed, one of the tusks was pulverized except for

the tip, and about half of the other survived. Van Tassell joked that he now has a lot of samples for radiocarbon dating.

A number of other bones were also recovered from the site by the contractor. Some vertebrae were found but were clearly too small to be that of a mammoth. They were identified as being from a Short-Faced Bear, and the bear's tail bones and right femur were also found. The bone that the student had brought to Jay's lab turned out to be the right rear tibia of a mammoth – this one stood about 9-1/2 or 10 feet high at the shoulder. It was classified as a juvenile from the size and from x-rays of bones which were made by a veterinarian in La Grande. It may be from the same animal as the tusks, which came from a male mammoth about 17-20 years of age based on the girth of the tusk. Another bone proved to be the radius/ulna of a very large male Giant Ice Age Bison. The contractor also dug adjacent to where the tusks were found and, instead of a mammoth skull, found the skeleton of a ground squirrel. These tiny bones are those of a Columbian Ground Squirrel, which is not found in the valley in modern times, as it prefers wetter and colder areas around the margins of the valley and on the slopes above the valley floor.

The forensic evidence from the site revealed that these Ice Age mammals may have died in a flood and were washed into the area approximately 12,700 years ago. This makes it one of the youngest Ice Age mammoth sites found in the Pacific Northwest. This is close to the time that the earliest human artifacts have been found in Oregon. It is possible that the mammoths survived later in the Grande Ronde Valley than in other parts of Oregon because early humans took routes that led them around the Blue Mountains as they migrated down from the north. This site will likely play a part in helping to decipher this mystery and what this is telling us about the cause of Ice Age extinctions.

NEW RULES: Putting the Federal Paleontological Resources Preservation Act into Action

Synopsis of the April 8, 2011, lecture by Courtney Cloyd, recently retired, formerly Senior Geologist for Geologic Hazards and Geologic Resources, U.S. Forest Service
by Carol Hasenberg

Courtney Cloyd spoke to GSOC last month about the Paleontological Resources Preservation Act, which became law in 2009 and governs the collection of fossils on Federal lands. It is the culmination of more than 20 years of effort and advocated by professional paleontologists for the preservation of the fossil record for public benefit. The law calls for the management of federal paleontological resources to be done "using scientific principals and expertise", and the plans to inventory, monitor and use the resources must "emphasize interagency coordination and collaborative efforts". As the former manager of the Geology and Paleontology program for the Forest Service, Cloyd was active in the development of regulations for this law and spoke to our group about its key points, exceptions and limitations.

Basically, the law gives a definition for paleontological resources, and states that these resources may not be collected on Federal lands without a permit. A paleontological resource can be a fossilized remain, trace, or imprint of an organism, except for such materials that have specifically defined archaeological or cultural significance which are covered by ARPA (the Archaeological Resources Protection Act). The law states particular criteria for the issuance of a collection permit and requirements for its execution. And it outlines civil and criminal penalties for violations of the law, which had been lacking in some earlier laws relating to fossils. The law further states that all fossil finds collected under permit on federal lands are to remain the property of the U.S. government. This is to ensure that fossils collected from Federal lands will be available for scientific research and public education through the museums or other approved repositories storing them.

An important exception to the law is for casual collecting, which some of us GSOC'ers have done. Casual collecting is only allowed on land administered by the Bureau of Land Management, Bureau of Reclamation, or the Forest Service. It is not allowed on National Park Service lands, where the collecting or damaging of any geological feature is strictly prohibited. Casual collecting is limited to common invertebrate and plant paleontological resources, so vertebrate fossils are not covered by this exception. Under the exception, collection must be for non-commercial personal use, collected in reasonable amounts, and result in negligible disturbance of the Earth's surface. These concepts are meant to be further defined in regulations that will be developed by the Secretary of the land being administered (Secretary of the Interior for BLM land and Secretary of Agriculture for the Forest Service).

Cloyd mentioned that the specific regulations governing casual collection and other fine points of the act are in the process of being developed by the Department of Agriculture for the Forest Service; the current unofficial target date for publishing draft regulations is March 31, 2012. They will cover the definitions of some of the concepts, permitting procedures, curation of finds, and criminal and civil penalties.

Non-profit local organizations such as GSOC and NARG (North American Research Group) can play a part of the management of paleontological resources. They are allowed to do the casual collecting as long as it is for the member's personal use. They also may apply for a permit to excavate a find following the criteria and requirements of the law. Also, if members spot a vertebrate or rare invertebrate or plant fossil, they can report its existence to the administrating entity. The rule of thumb "if it's a bone leave it alone" applies here. The Forest Service and BLM welcome questions and information from local non-profit interest groups, and hope to develop mutually beneficial working relationships with them.

The law does not prohibit anyone from writing about fossil finds. However, Cloyd pointed out that disclosing the location of important finds may increase their exposure to the risk of vandalism or theft, so this must be done with discretion and caution. In addition to the ARPA exception for archaeological materials, the law does not apply to Indian lands, nor does it cover materials governed by the general mining law, mineral and geothermal leasing law or mineral materials disposal law. The law also does not address private or state lands.

One big problem with the management system for paleontological resources is the availability of adequate facilities for their curation. Many museums cannot accept more fossils because they are full. This will be one of the challenges to administering this important law.

REFERENCES AND ADDITIONAL READING

A copy of the Paleontological Resources Preservation Act can be obtained from the BLM website (www.blm.gov) by googling the following keywords: "paleontological resources preservation subtitle D" or by clicking this really long link: http://www.blm.gov/pgdata/etc/medialib/blm/wo/Planning_and_Renewable_Resources/coop_agencies/paleontology_library/paleon_legis.Par.45651.File.dat/PL-111-011-prpa.pdf

The Omnibus Public Land Management Act of 2009 contains the Paleontological Resources Preservation Act and is overviewed on the Wikipedia website: http://en.wikipedia.org/wiki/Omnibus_Public_Land_Management_Act_of_2009

Geological Society of the Oregon Country Activities:

ANNUAL EVENTS: President's Field Trip—Summer or Fall; Banquet—March; Annual Business Meeting—February.

FIELD TRIPS: About 4 per year. Fees: see field trip announcements on the calendar next page.

GSOC LIBRARY: Rm. 69, Cramer Hall, Portland State University. Open 7:00 p.m. prior to meetings.

PROGRAMS: Second Friday evening most months, 7:30 p.m., Rm. S17, Cramer Hall, PSU, SW Broadway at SW Mill St., Portland, Oregon.

MEMBERSHIP: Per year from January 1: Individual--$25, Family--$35, Junior (under 18)/Student--$15. Membership applications are available on the website www.gsoc.org.

PUBLICATIONS: THE GEOLOGICAL NEWSLETTER (ISSN 0270 5451), published monthly and mailed to each member. Subscriptions available to libraries and organizations only at $20.00 per year. Single Copies are available at $2.00 each. Order from:

Geological Society of the Oregon Country, P.O. Box 907, Portland, Oregon 97207

TRIP LOGS: Write to the same address for names and price list.

APPLICATION FOR MEMBERSHIP
THE GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Name_____ **Spouse**_____

Children under age 18_____

Address _____ **City** _____ **State** ___ **Zip**_____-_____

Phone (_____**)**_____-_____ **Email address**_____

Geologic Interests and Hobbies_____

_____

Please indicate Membership type and include check for appropriate amount:

Individual $25.00 _____ **Family $35.00** _____ **Student $15.00** _____

Make Check Payable to: **The Geological Society of the Oregon Country**
PO Box 907
Portland, OR 97207-0907

THE GEOLOGICAL NEWSLETTER

"NEWS OF THE GEOLOGICAL SOCIETY OF THE OREGON COUNTRY"

VOLUME 77, NUMBER 4
JULY/AUGUST 2011

The Geological Society of the Oregon Country
P.O. Box 907, Portland, OR 97207-0907
www.gsoc.org
2011 - 2012 Administration:
President:
Rik Smoody - 360/546-2019
science@smoo.com
Vice-President:
Jane Walpole – 503/590-7501
antjane@aol.com
Secretary
Paul Edison-Lahm – 971/404-6064
edisonlahm@comcast.net
Treasurer
Richard Bartels – 503/292-6939
bartbartels@comcast.net
Directors:
Anne O'Neill (1 year) - 503/477-7827
a.oneill@yahoo.com
Dawn Juliano (2 years) - 503/367-7708
dawnmj_2000@yahoo.com
Julia Lanning (3 years) – 503/201-8022
julia@julialanning.com

Past Presidents:
Larry Purchase – 360/254-5635
lkpurchase@q.com
Carol Hasenberg – 503/522-4249
csh727@comcast.net
Newsletter Editor and Calendar:
Carol Hasenberg – 503/522-4249
csh727@comcast.net
Website:
Janet Rasmussen – 541/753-0774
jkayerocks@yahoo.com
Business Manager:
Jan Kem – 503/246-2275
jankem5@msn.com
Assistant Business Manager:
Anne O'Neill - 503/477-7827
a.oneill@yahoo.com
Field Trip Committee Chair
Dave Olcott– 503/695-5219
daveolcott46@yahoo.com

VISITORS WELCOME AT ALL MEETINGS

CALENDAR

JULY/AUGUST ACTIVITIES

There will not be Friday night talks in July or August for 2011. Have a nice summer and attend one of our field trips!

GSOC Annual Picnic

The GSOC Annual Picnic will be held on Sunday, July 17, 2011. This year's picnic will be a total potluck event at the picnic area atop Larch Mountain in the Columbia River Gorge. Bring your own food and beverages and we will provide the plates and plastic utensils. It also wouldn't hurt to bring your own chairs and perhaps a card table if you have one, as the available picnic tables are scattered. The picnic will begin at 12:00 noon and there will be a brief GSOC board meeting before the picnic at 11:00 a.m. Plan an hour's driving time from Portland.

For information about the picnic site see the Larch Mountain picnic area page on the Forest Service website. You will need a $5 day-use permit or a FS recreation pass to park there. Day-use permits may not be available on site according to our information. For more information on Forest Service recreation passes (and alternatives) see the FS Region 6 Recreation Passes & Permits page. To purchase a day-use permit or FS recreation pass online or through a Forest Service outlet see Discover Your Northwest Store and Store Locations. They are also available from some commercial establishments such as REI and Big Five. They are not available at the Nature of the Northwest store anymore. In the event that Larch Mountain remains closed due to prolonged snowpack we will announce an alternate location on the GSOC website. However, at this point the Forest Service believes that the road will be open before our picnic date. Check to the GSOC website the

day before the picnic for final confirmation of the location, or call another member who has done so.

The directions to Larch Mountain on the website are really lousy, so here are some better directions courtesy Dave Olcott:
Traveling east on I-84 from the Portland area, take Exit 22 (Corbett). Travel 1.6 miles up Corbett Hill Road to the intersection with the Historic Columbia River Highway - turn left onto the old highway. Travel approximately 2 miles to Larch Mt. Road (go straight). If you go left at this point you will end up at the Vista House. Proceed 14 miles up Larch Mt. Road to the upper parking lot.

For more geology info on Larch Mountain refer to the USGS and Wikipedia sites. This should be an outstanding site for a picnic.

Ancient Walls: A Geological Walking Tour of Downtown Portland

Come see billion-year-old building stones and the fossils hidden under our feet. Join us Saturday, August 6th at 9:00 a.m. at Pioneer Place Mall in the food court in front of Paradise Bakery (700 SW 5th Avenue — parking at 4th and Yamhill — accessible by bus and MAX) for a two-and-a-half-hour outdoor walking tour of downtown Portland's geological mysteries and oddities. Bring good walking shoes, water, sunscreen and clothing for a cool, but possibly rapidly warming summer morning. Snacks are also advisable, although the trip will end at a lunch stop. Bring your own loupe if you have one. The trip is open to the public. Children under 12 must be supervised by their parents. Cost is $5.00. Please RSVP to Clay Kelleher clayr2236kher@comcast.net by July 29.

2011 GSOC President's Field Trip: "Aggradation near Mt. Rainier"

August 11-14, GSOC President Rik Smoody is planning the GSOC President's Field Trip, with the theme of aggradation processes near Mt. Rainier. Aggradation is the process by which streams deposit material. This will be a car-caravan and camping trip which will include some stops in Mt. Rainier National Park.

The trip registration form and itinerary are located at the back of this newsletter. Rik has also put together some info on camping, lodging, and dining FYI:
Camping & Lodging: Smoody's have reserved site #8 for August 11, 12, & 13 at Big Creek Campground, a USFS campground only a couple of miles from the Nisqually entrance to the park, not even as far as Ashford. It's in a forest. RV or tent. All spots are within easy walk of each other. There are picnic tables and fire rings.

Other campgrounds, B&Bs and motels are available in the area. Without staying in any of them, Rik made note of several, and later found that Google maps knows of each one. The Cougar Creek and Ohanapecosh campgrounds within the Park have smaller spaces and more restrictions. Trip Advisor site has pages on Mt. Rainier attractions and lodging. Call Rik or Carol Hasenberg (503/522-4249) if you have questions about other camping or lodging.

Some Dining ideas:

- Wild Berry Restaurant, just outside the park on the Leg A (Star Route 706). Sherpa-operated, tasty, $8-13
- Paradise Inn: beautiful setting. Meals upwards of $20

Several plausible restaurants are in Ashford.

- Train car restaurant in Elbe, 8mi W of Ashford. Venison and other uncommon burgers for $13.
- Smaller burger joint across the road from the train cars. ~$6
- Enumclaw has a full selection of fast food and others for Sunday on the way out

NOTE: You must be a GSOC member or guest of a member to attend this GSOC field trip. You may join GSOC at any time, for $25.

Future Activities

Friday evening talk, September 9, 2011, at 7:30 p.m., in Room S17, Cramer Hall, 1721 SW Broadway Ave. (between Montgomery and Mill Sts.), Portland State University. Speaker Douglas W. Larson, limnologist and writer living in Portland, will present "Saving Lake Abert".

For more information about Larson's life and work on Lake Abert and other lake ecology studies, see Oregonlive.com article from February 2011, Craterlakeinstitute.com, Craterlakeinstitute.com and Americanscientist.org articles. Also see the December 2007 issue of *The Geological Newsletter* for "Doug Larson Gives GSOC a Tour Of Lake Origins," an article about a previous lecture to GSOC by Mr. Larson.

Join GSOC members at **Pizzicato Pizza, 1708 SW 6th Ave.**, at **6:00 p.m.** before the lecture for an informal dinner and conversation.

Free parking is available at Portland State University **Friday** nights after 5 p.m. in Parking Structure 2 on Broadway Ave. directly across from Cramer Hall and on level one of Parking Structure 1, bounded by Broadway and 6th Aves. and Harrison and Hall Streets.

Check the GSOC website (www.gsoc.org) for updates to the calendar.

UPCOMING ACTIVITIES FROM OTHER ORGANIZATIONS

OMSI Science Pub Portland
There are TWO Science Pubs in Portland -- one at the Bagdad Theater in Southeast, and one at Mission Theater in Northwest. Learn about cutting-edge topics in science and technology from leading researchers and scientists, all while enjoying food and drinks. Experience an informal atmosphere where you can interact with experts and where there are no silly questions. No scientific background is required; just bring your curiosity, sense of humor, and appetite for food, drinks, and knowledge!

The Big Bang and Beyond: A Beginner's Guide to the Universe
Monday, July 11, 2011 - 7:00pm
Portland - Bagdad Theater
What does the Universe look like and what is our place in it? How is it evolving and what did it look like in the distant past? What will it be like in the future? Join Willamette University physics chair and cosmologist **Dr. Rick Watkins** in an exploration of the Universe and its evolution.

Demon Fish: Travels Through the Hidden World of Sharks
Tuesday, July 26, 2011 - 7:00pm
Portland - Mission Theater
One week later than usual!
with author **Juliet Eilperin**, the national environmental reporter for The Washington Post.

Epigenetics: The Merger of Nature and Nurture
Tuesday, August 16, 2011 - 7:00pm
Portland - Mission Theater
Can your genes learn by experience?

Every cell in your body has the same set of genes, but those genes do not work in every cell in the same way. For example, your tongue cells don't grow hair and the cells in your eye don't digest food. Your cells are programmed to modify genes based on their function in the body, and some of those modifications occur in response to the environment: genes that cause the production of pigment in your skin are activated when your skin is exposed to sunlight, and genes that caused your fingers and toes to develop before you were born are inactivated for the rest of your life.

It has been thought that only mutations in the DNA could be passed on to the next generation and that traits acquired during a parent's life are not passed to their offspring, e.g. weight lifters don't produce babies with big muscles. However, recent research suggests that some genetic changes that happen over a lifetime are heritable. That is, while it may be true that "you are what you eat," it may also be true that "you are what your mother ate."

Epigenetics is the study of genetic changes that are based on mechanisms other than changes in the underlying DNA and it is changing the way scientists look at disease risk and treatment. At this Science Pub, come find out about new discoveries in genetics and how they might affect you or your kids.

Lisa Sardinia,PhD, JD, is associate professor of biology at Pacific University and associate director of the Pacific Institute for Ethics and Social Policy.

Check the OMSI Science Pub website for updates to the lectures. http://www.omsi.edu/sciencepubportland

BOARD MEETING NOTES

June 11, 2011

The meeting was called to order by President Rik Smoody at the home of Carol Hasenberg. Board and GSOC members present also included Jane Walpole, Paul-Edison Lahm, Richard 'Bart' Bartels, Bev Vogt, Julia Lanning, Larry Purchase, Carol Hasenberg, Dave Olcott, and Jan Kem. The minutes of the April 9, 2011 board meeting and the minutes of the May 14, 2011 special board meeting were approved with the following corrections: the annual picnic will be held in July instead of a regular

meeting; and the Downtown PDX field trip will start at 9:00 am.
Treasurer's report: Treasurer's Report was approved.

Events
Friday night lectures: Jane has arranged to have Doug Larson speak on "Saving Lake Abert" in September. Scott Burns will speak in November. Other speakers with dates yet to be arranged include Charlene Montierth from Clark College, Richard Waite from CVO, and Rob McCaffery from PSU. A larger room may be needed for Drs. Waite and Burns. Bev suggested bringing the "chatterbox" microphone to address the problem of people in the back having trouble hearing.
Publicity and poster distribution: Board discussed more efficient and effective means of publicizing Friday night lectures.

Field Trips
Neogene Floods trip recap: Seven field guides from the trip remain. Dave's proposal to price them at $35 each was approved (with that price to be discounted later at the next annual meeting). Dave will also establish a price for his own guide later.
Central Oregon Coast Trip. Bart reports that this field trip is full!
Downtown PDX field trip: Field trip price will be $5 per person.
President's Field Trip. Rik will do a dry run this weekend and check out campsite availability and get info to Carol for newsletter. Carol will assist in looking for group campsites. Speakers may include Pat Pringle and a geologist from University of Washington.
Annual Picnic will be held July 17th at noon. Picnic is potluck, BYOB & BYOM. Julia and Ann will work to coordinate plates/utensils, etc. Our next board meeting will be held before the picnic at 11:00 a.m.

Old and New Business
Newsletter distribution and membership issues. Jan's suggestion to drop members who haven't paid their dues since 2009 from the mailing list was approved... Jan will forward the list of the twenty-two members who haven't paid for 2011 to Rik who will send them nice reminder emails... Friday night speakers and tour speakers will automatically be granted a one year membership, so Bart will need to be provided with the speakers' addresses so he can collect this information. Jan also requests that any names of prospective members be sent to him, so that he can send them a free copy of the newsletter. (This also assists in reaching the 200 piece bulk mail requirement.)
Website/Internet committee: Rik continues to look for a wiki server that will have an appropriate privacy policy so that some information, such as officer's duties and a list of GSOC property, can be viewed by board members only. Rik has the password for members who want to post items of geological interest on the "GeoSociety Oregon" Facebook account. This would also allow any inappropriate Facebook comments to be monitored and deleted.
Sales items/mugs: GSOC will be getting some new mugs ordered soon with the GSOC logo on them.
Next board meeting will be held at the annual picnic, Sunday July 17th at 11:00 a.m.

Meeting adjourned.

Respectfully submitted,
Paul Edison-Lahm,, GSOC Secretary

RAISING A DAM FOR BARNEY RESERVOIR AND WASHINGTON COUNTY'S WATER SUPPLY

Synopsis of the May 13, 2011, lecture by Charlie Hammond, geologist, Cornforth Consultants
by Carol S. Hasenberg

Charlie Hammond, son of long-time GSOC member and PSU professor emeritus, Paul Hammond, is a respected geologist in his own right, and has been employed by Cornforth Consultants, a local geotechnical engineering firm, since the late 1980's. He spoke to GSOC this past May about an interesting local project he was involved with in the mid to late 1990's – the raising of the Eldon Mills Dam. This earthen dam impounds water in Barney Reservoir, which is one of the principal sources of water for Washington County's Joint Water Commission, which supplies water to the cities of Forest Grove, Hillsboro, and Beaverton.

The original earthen dam for Barney Reservoir was built over the summers of 1969 and 1970 and impounded 4000 acre-feet of water in the high point of the Coast Range on the North Fork of the Trask River. It is located several miles west of Hagg Lake and is a bit off the beaten track, as one must travel many miles on gravel roads to get there. The original dam was 72 feet high, had an earth-fill core with a sand chimney drain to control seepage through the structure – a sloped sand layer in the middle of the dam directed water down to the base and out the bottom. The spillway for this old dam was a "glory hole," or long pipe which had a downstream outlet from the dam (kind of like a bathtub drain).

The water commission hired Cornforth Consultants to design a dam capable of impounding 20,000 acre-feet of water. Because of the dam's remote location, material for the new structure had to come from the surrounding area, and Hammond was involved in the categorization of the local geologic layers and the determination of their suitability for use in the dam construction, and also the problems that local geology will pose in the design of the dam. Cornforth also worked with the respected firm Geomatrix, who did the seismic hazard study for the dam site.

The local geology contained sedimentary and volcanic layers from the Eocene, which included the Yamhill Formation (marine sediments), Siletz River Volcanics, and Tertiary intrusive dikes and sills. There were also some Quaternary colluvium and saprolite. The most promising material for use in the construction of the dam was the intrusive rock which could be used to fill the new part of the dam. The most problematic material was the saprolitic sandy silt lying typically between 4 to 30 feet directly under the dam.

The design for the new dam called for its construction on the downstream side of the old dam with borrow materials taken from upstream and downstream of the dam area. The new construction was designed to be rock fill with a new chimney drain. The new dam raised the normal water level in the reservoir 50 feet. The new dam also has a weir-type spillway

The earthquake design called for the new dam to withstand accelerations of 0.3g. Laboratory cyclic testing (shake testing) showed that the saprolitic layer beneath the dam could theoretically liquefy at this intensity, so under the new construction the layer was removed and replaced with rock fill. The earthquake modeling performed for the new dam showed that it is stable under the design load when the reservoir is full. One consequence exists due to the old dam and its underlying saprolite, when the reservoir is drawn down there is potential instability in the area of the old dam on the upstream side of the new dam. But since the reservoir is lowered this would not result in an uncontrolled release of water.

Definition
"saprolite – A soft, earthy, typically clay-rich, thoroughly decomposed rock, formed in place by chemical weathering of igneous, sedimentary, and metamorphic rocks. It often forms a layer or cover as much as 100 m in thickness, esp. in humid and tropical or subtropical climates; the color is commonly some shade of red or brown, but it may be white or gray. Saprolite is characterized by preservation of structures that were present in the unweathered rock." – Glossary of Geology, Fifth Edition, American Geological Institute.

References and Additional Reading:

Cornforth Consultants website:
http://www.cornforthconsultants.com/projects-earth-dams-barney.htm

Joint Water Commission Home page:
http://www.jwcwater.org/Index.asp?pgid=1

City of Beaverton's Drinking Water Supply page:
http://www.beavertonoregon.gov/departments/ecd/utilities/drinkingwatersupply.aspx

Cascadia Subduction Zone is Giving Us the "Slow Slip"

Synopsis of the June 10, 2011, lecture by Evelyn Roeloffs, Research Geophysicist for the USGS Earthquake Science Center in Vancouver, Washington
by Carol S. Hasenberg

Things have come a long way since the 1980's with earthquake research in the Northwest. Back then, plate tectonics was a relatively new geologic discipline, and scientists mostly relied on the historical record to determine the seismicity of a region. Oregon was thought to be a region of little seismic hazard.

Earthquake scientist Evelyn Roeloffs began her lecture to a packed Cramer Hall S17 last month with a quote from former State Geologist, founder of PSU Geology Department and GSOC Past President John Eliot Allen in 1983, who had stated that "We in the Northwest may have to live with volcanic eruptions but we hope that the (U.S. Geological) Survey's vulnerability map is correct and that we will not also have to look forward to large earthquakes as well."

As we all know now, the hopes of Dr. Allen were not realized. Some excellent work done by a number of researchers, most notably by Brian Atwater, showed that Oregon, Washington, British Columbia, and the northern part of California are periodically affected by megathrust earthquakes along the Cascadia Subduction Zone (CSZ). The terror caused by these enormous earthquakes has been brought home to us in the last decade by modern media coverage of three such quakes that struck Indonesia in 2004, Chile in 2010, and Japan in 2011.

These events have caused more research efforts to be made in the Pacific northwest, and new types of instrumentation has facilitated this research. A number of scientists including OSU's Chris Goldfinger and CWU's Tim Melbourne began to use Global Positioning System (GPS) data to monitor motion on the North American Plate in order to study the subduction zone. North of the border, Roy Hyndman and Kelin Wang of the Geological Survey of Canada were conducting studies of the overriding plate in order to determine the extent of the "locked zone," which would be the area of the plate boundary to rupture in a megathrust event. Their colleague Herb Dragert installed a network of continuous GPS stations to monitor crustal deformation.

An interesting phenomenon was observed when Dragert carefully analyzed his GPS data. The overriding North American plate, which was steadily being pushed east with the converging Juan de Fuca/Explorer/Gorda Plate system, would periodically reverse motion and move to the west over a period of several days. These slip events, on the order of a few millimeters, occurred about every 14 months. Not only that, but low frequency tremors were found to coincide with these slip events. Dragert was convinced that these slip events were really important in the study of subduction plate movement, and continued to do studies of them. The events have now been studied for about one and a half decades, primarily in the Pacific northwest and Japan where instrumentation arrays are more robust.

The slow slips observed in the CSZ were found to occur in a region east of what was believed to be the locked zone, and at depths of between 30 and 40 km of depth, the bottom of which coincides with the Moho boundary for the North American continent. The slow slip periods, referred to as ETS or "Episodic Tremor and Slip" by Dragert, are so named because tremors always accompany the slip. ETS events do not usually occur on the entire CSZ at the same time. There are three distinct regions, denoted from north to south as the Wrangellia, Siletzia, and Klamath Zones. Average times between ETS events are 14 months in Wrangellia, 22 months in Siletzia, and 8 months in Klamath.

The events in the northern region have been well-studied by Dragert and other researchers. In the US the PBO, or Plate Boundary Observatory funded by the National Science Foundation, provides instruments installed and operated by the non-profit

group UNAVCO to study Cascadia, including the first borehole strainmeters in Oregon, Washington, and on Vancouver Island. The strainmeters are about 10 feet long and are cemented into the bottoms of boreholes 500-800 feet deep to isolate them from surface "noise". The tremor and borehole strainmeter data imply that Wrangellia slip events tend to start south and propagate north (Puget sound to Vancouver island), but sometimes start in the middle and propagate north and south. Different analyes of daily GPS positions show slow slips going into the locked zone or staying east of the locked zone. Tremors are centered in regions immediately adjacent to regions of slip, so that there seems to be a relationship between the tremors and propagation of the slip.

These slip events have also been observed in subduction zones in Japan and other areas. They are particularly prevalent where younger crust subducts beneath a continent, and there is variation of the timing and tremors accompanying the slippage. The physical processes which govern the slippage and tremors vary by rates of convergence, metamorphic processes of the crustal composition, amounts and types of fluids from these processes, plate boundary geometry and other parameters. Studying the phenomena is also difficult because very sensitive (and generally expensive) arrays of instrumentation are required. GPS sensors can just barely register the movements, but more sensitive borehole strainmeters are expensive and their data is harder to interpret So far the instrumentation has also been limited to land-based sensors but some oceanic sensors are planned.

Of course the most important question about slow slip events is, how are they related to megathrust earthquakes? It is clear that slip events, which over the course of their movement, generate slippage equivalent to that of a M6+ earthquake, are a mechanism by which a lot of the strain in the plate boundary zone is released. However, they also are believed to load the locked zone with additional strain. Earthquake scientists are working on lab and computer models of the subduction processes by which they can simulate plate convergence and generate data that agrees with observed phenomena.

Detailed information about these slip events continue to give researchers food for thought about the physical mechanisms that characterize subduction zone movement, and perhaps someday, of providing means of predicting or warning populations of megathrust events. Roeloffs's research at USGS is focused on improving methods for interpreting borehole strainmeter data.

Definition

Moho – Short for Mohorovicic discontinuity. The Moho boundary is defined by the depth at which seismic P-waves abruptly change velocity from about 7 km/s above the zone to about 8 km/s below the zone. It represents either a compositional change or a phase change in the rock structure due to the heat and pressure conditions at this depth. The depth of the Moho is about 5-10 km below the oceanic crust and about 40-70 km below the continental crust. – adapted from the Glossary of Geology, Fifth Edition, American Geological Institute.

References and Additional Reading:

Joan Gomberg and the Cascadia 2007 and Beyond Working Group, "Slow-slip phenomena in Cascadia from 2007 and beyond: A review," GSA Bulletin; July/August 2010; v. 122; no. 7/8; p. 963–978; doi: 10.1130/B30287.1; 10 figures, Published online March 29, 2010; doi:10.1130/B30287.1. This article summarizes the state of knowledge on slow slip phenomena.

The Plate Boundary Observatory page on the UNAVCO website is loaded with information about this important research endeavor. There is also the new PBO website. All PBO data are freely available and their use by students and the public is encouraged.

Herb Dragert's Page for the Geological Survey of Canada has a list of his important papers about ETS and related studies.

Quote from John Eliot Allen can be found on Beth Casper, "Danger lurks below in Oregon (Cascadia Subduction Zone)" *Statesman Journal*, September 15, 2005 and is published on the freerepublic.com website.

Geological Society of the Oregon Country Activities:

ANNUAL EVENTS: President's Field Trip—Summer or Fall; Banquet—March; Annual Business Meeting—February.

FIELD TRIPS: About 4 per year. Fees: see field trip announcements on the calendar next page.

GSOC LIBRARY: Rm. 69, Cramer Hall, Portland State University. Open 7:00 p.m. prior to meetings.

PROGRAMS: Second Friday evening most months, 7:30 p.m., Rm. S17, Cramer Hall, PSU, SW Broadway at SW Mill St., Portland, Oregon.

MEMBERSHIP: Per year from January 1: Individual--$25, Family--$35, Junior (under 18)/Student--$15. Membership applications are available on the website www.gsoc.org.

PUBLICATIONS: THE GEOLOGICAL NEWSLETTER (ISSN 0270 5451), published monthly and mailed to each member. Subscriptions available to libraries and organizations only at $20.00 per year. Single Copies are available at $2.00 each. Order from:
Geological Society of the Oregon Country, P.O. Box 907, Portland, Oregon 97207

TRIP LOGS: Write to the same address for names and price list.

APPLICATION FOR MEMBERSHIP
THE GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Name_____ **Spouse**_____

Children under age 18_____

Address _____ **City** _____ **State** ___ **Zip**_____-_____

Phone (_____**)**_____-_____ **Email address**_____

Geologic Interests and Hobbies_____

_____

Please indicate Membership type and include check for appropriate amount:

Individual $25.00 _____ **Family $35.00** _____ **Student $15.00** _____

Make Check Payable to: **The Geological Society of the Oregon Country**
PO Box 907
Portland, OR 97207-0907

The Geological Newsletter

"News of the Geological Society of the Oregon Country"

Volume 77, Number 5
September/October 2011

The Geological Society of the Oregon Country
P.O. Box 907, Portland, OR 97207-0907
www.gsoc.org
2011 - 2012 Administration:
President:
Rik Smoody - 360/546-2019
science@smoo.com
Vice-President:
Jane Walpole – 503/590-7501
antjane@aol.com
Secretary
Paul Edison-Lahm – 971/404-6064
edisonlahm@comcast.net
Treasurer
Richard Bartels − 503/292-6939
bartbartels@comcast.net
Directors:
Anne O'Neill (1 year) - 503/477-7827
a.oneill@yahoo.com
Dawn Juliano (2 years) - 503/367-7708
dawnmj_2000@yahoo.com
Julia Lanning (3 years) – 503/201-8022
julia@julialanning.com

Past Presidents:
Larry Purchase – 360/254-5635
lkpurchase@q.com
Carol Hasenberg – 503/522-4249
csh727@comcast.net
Newsletter Editor and Calendar:
Carol Hasenberg – 503/522-4249
csh727@comcast.net
Website:
Janet Rasmussen − 541/753-0774
jkayerocks@yahoo.com
Business Manager:
Jan Kem − 503/246-2275
jankem5@msn.com
Assistant Business Manager:
Anne O'Neill - 503/477-7827
a.oneill@yahoo.com
Field Trip Committee Chair
Dave Olcott– 503/695-5219
daveolcott46@yahoo.com

VISITORS WELCOME AT ALL MEETINGS

CALENDAR

September/October Activities

Friday evening talk, September 9, 2011, at 7:30 p.m., in Room S17, Cramer Hall, 1721 SW Broadway Ave. (between Montgomery and Mill Sts.), Portland State University. Speaker Douglas W. Larson, limnologist and writer living in Portland, will present "Saving Lake Abert".

For more information about Larson's life and work on Lake Abert and other lake ecology studies, see Oregonlive.com article from February 2011, Craterlakeinstitute.com, Craterlakeinstitute.com and Americanscientist.org articles. Also see the December 2007 issue of *The Geological Newsletter* for "Doug Larson Gives GSOC a Tour Of Lake Origins," an article about a previous lecture to GSOC by Mr. Larson.

Join GSOC members at **Pizzicato Pizza, 1708 SW 6th Ave.**, at **6:00 p.m.** before the lecture for an informal dinner and conversation.

Free parking is available at Portland State University **Friday** nights after 5 p.m. in Parking Structure 2 on Broadway Ave. directly across from Cramer Hall and on level one of Parking Structure 1, bounded by Broadway and 6th Aves. and Harrison and Hall Streets.

Friday evening talk, October 14, 2011, at 7:30 p.m., in Room S17, Cramer Hall, 1721 SW Broadway Ave. (between Montgomery and Mill Sts.), Portland State University. Speaker Roger Denlinger, USGS Cascades Volcano Observatory, will present "Catastrophic inundation and slow drainage: the story of the Missoula Floods".

Denlinger will present his computer model of the outburst floods from Pleistocene glacial Lake Missoula,

and compare the results to field observations of the actual results of the floods. For a recent article about the models, see Oregonlive.com.

Future Activities

Friday evening talk, November 11, 2011, at 7:30 p.m., in Room S17, Cramer Hall, 1721 SW Broadway Ave. (between Montgomery and Mill Sts.), Portland State University. Speaker Scott Burns, Portland State University professor of Geology, will present "Our National Parks".

Friday, December 9, 2011, will be the night of the 3rd Annual GSOC Christmas Party. The party will be held in lieu of the December Friday night meeting and attendance will be limited to GSOC members and their guests. The location will be at the Simon Benson House on the Portland State University campus. The program will include slide shows of this year's field trips, food dishes-to-share as provided by the attending members, and music. Donations to help cover the venue rental are being accepted by GSOC Treasurer Richard Bartels. Food and other contributions to the event will be coordinated by GSOC Director Anne O'Neill.

Check the GSOC website (www.gsoc.org) for updates to the calendar.

BOARD MEETING NOTES

July 17, 2011

The meeting was called to order by President Rik Smoody at the home of Dave Olcott who graciously offered his home when today's annual picnic was rained out. Board and GSOC members present also included Paul-Edison Lahm, Richard Bartels, Bev Vogt, Julia Lanning, Dawn Juliano, Anne O'Neil, Larry Purchase, Carol Hasenberg, Janet Rasmussen, and Jan Kem. The minutes of the June 11, 2011 board meeting were approved.

Treasurer's report: Bart reported the current account balances to the board. Report was approved.

Field Trips

Janet recapped her successful Central Oregon Coast trip. Paul announced that the planning for "Downtown Portland Geology" walk is coming along well. He will write a thank you letter to Doug Magedanz of the Architectural Heritage Center for the gift of two pieces of Meier & Frank "Georgian Room" marble and send a link to the "Virtual Tour" for the GSOC website. Rik announced that the President's field trip planning is also moving apace. Rik has booked Pat Pringle for Friday and Chris Magril for the White River Saturday, but is still looking for an expert for Sunday. Additional campground information will be covered in the newsletter.

Old and New Business

Business manager report: Jan announced that the projector is now being kept at Bart's house. Since Jan is going on vacation, Assistant Business Manager Ann will do the newsletter for September and October.

Mugs: Carol reports that the GSOC mugs should arrive next week. A consensus was not reaching on mug pricing and that question was tabled.

Website/Internet committee: Rik has found the answer to the question: where do we keep our online data (job duties, newsletter copies, inventory list, membership list, etc.): Google docs. Motion approved to port these documents to Google docs and report back to the board at the next meeting.

Board Votes by Email: Paul asked how the Secretary should record the results of board decisions made by email. Motion for email voting protocol approved as follows:

1. The board member who initially called the board vote by email will record the decision, the vote tally and the presence of quorum in an email tagged in the subject line. The Secretary will then upload this email to Google docs.
2. At the time of approval of the minutes at the next board meeting, the Secretary will present the email record of the vote for approval as to form only.

Carol will send an email recording the recent vote on mug design to Paul as an example.

Holiday Party (Ann): Date of party was set for December 9th, 2011 at the Simon Benson house:

- 6:30 p.m.-- Dinner/buffet
- 7:30 p.m.-- "Year in Review" in back room
- 8:30 p.m.-- Cookies/dessert.

Donations will be accepted for the room rental. Musicians are encouraged to volunteer for the Christmas chamber players. Dress code will be "dressy."
Next Meeting date & time: **Saturday, Sept 10th, 10:00 a.m.** at the **Smoody residence**.
Meeting Adjourned.
Respectfully submitted,
Paul Edison-Lahm, Secretary

SMUG MUGS

GSOC is proudly selling its new logo mugs. The mugs feature a GSOC logo on each side of the cup, plus the statement 'Supporting Geology in the Pacific Northwest since 1935' and the website address 'GSOC.org' opposite the handle. Pricing schedule is $7 each, two for $13 and four for $25. Contact Richard Bartels or Carol Hasenberg for more information.

NEWPORT AT MIDSUMMER'S WEEKEND

Synopsis of the "Tidepools, Tsunamis, and Terraces" trip lead by GSOC Past President Janet Rasmussen, June 17-19, 2011
Guest field trip guides included Alan and Wendy Niem, George Priest, Karen Driscoll, and Patrick Breshears
by Carol Hasenberg

Another great trip planned by our wonderful social organizer Janet Rasmussen. Janet's gift is that she includes really fun people-oriented activities In her trips without neglecting the geology and natural sciences. We owe several great trips to her organizational skills.

The trip began at Janet's house in Corvallis on the beautiful afternoon of Friday, June 17. There was some geology there, because Janet had gotten curious about a big rock in her backyard. Turns out that this rock is of the same intrusive "massive granophyric ferrogabbro" material that constitutes nearby Mary's Peak, the highest point in the Oregon Coast Range. The rock is harder than the surrounding Eocene Siletz River Volcanics, and so it weathers slower and sticks out.

Onward and upward. Literally, as the GSOC car caravan ascended into the Coast Range on US 20 traveling from Corvallis to Newport. The route took the participants through the Siletz River outcrops and into the arch of the Coast Range, which is dominated from the Upper Eocene/Oligocene aged marine sediments of the Tyee Formation. (Those of you who went on the 2003 GSOC field trip to the southern Oregon Coast will remember that we passed through the Tyee on our way down the Umpqua Valley.) At first the sediments dipped to the east as the group traveled, but then leveled off and began dipping to the west, following the arch produced by the compressive forces in the forearc region of the Cascadia Subduction Zone.

At one particularly good roadcut exposing layers of Tyee arkosic sandstone alternating with crumbly shales and clays the group stopped to observe. The current explanation for these layers is that the sandstone layers, which are 3-4 feet in thickness, are the result of turbidites (underwater landslides) from sediments coming off the Klamath Mountains, perhaps set off by earthquakes, and the clayey layers represent the slow deposition of fines between the catastrophic events. The clayey layers can produce some catastrophic events of their own

as landslides plague the highway construction and maintenance efforts along US 20.

On the way into Newport the group peeled off US 20 at Toledo to take the Yaquina River route into town. Along this scenic drive the GSOCers passed the pilings of the abandoned trestle for the old Yaquina Railroad, which took a lot straighter path along the river than the road does today. Arriving along the historic waterfront area in Newport, the group ascended to Highway 101 and travelled north to Beverly Beach State Park where Janet had organized a pot luck dinner in the Group Meeting Hall.

The dinner featured a grilled salmon caught by fisherman Dave Logsdon, who was a guest of the group at the meal. It was quite a feast. The dinner was preceded by a talk from biologist Karen Driscoll describing tidepool flora and fauna that the group would be seeing the following morning in the Otter Crest marine garden's tidepools. GSOC members took in a beautiful walk on Beverly Beach with the long midsummer light of the evening.

Next morning the group woke up to a steady drizzle. Donning rain gear and warm clothing, many of the members got up early to visit the tidepools with Karen Driscoll. This was one of the lowest tides of the year and so the group got to see a lot of good stuff.

Next the group came in from the rain for a presentation by Oregon State University professor emeritus Alan Niem, with assistance by his geologist wife Wendy Niem. Niem explained that the Oregon coast is so beautiful because the sandy beaches alternate with these dramatic basalt headlands. The headlands in the Newport area include Yaquina Head, Otter Crest, and Cape Foulweather. Niem first studied these formations under the tutelage of his old mentor Parke D. Snavely, Jr.

Snavely was a supporter of the "two-vent model" of how Miocene basalt was formed on the Oregon coast. Geologists of that era knew that the Columbia River flood basalts were spreading in eastern Oregon and Washington at the same time and with similar composition to these coastal headlands, but could not see how they could have made it overland to the ocean. So the geologists labeled these basalts as "Cape Foulweather Basalt" and thought that they arrived by travelling up the Cascadia thrust fault or similar pathway and were related to, but not the same origin as, the Columbia River Basalts. This was supported by the fact that basalt dikes were found that had fed the formations and so it was thought that these extended to the melting zone below.

Further studies of the Columbia River Basalt Group (CRB) were conducted by professor Marvin Beeson of Portland State University and several of his highly talented graduate students, including GSOC Past President Beverly Vogt. Beeson recognized that CRB traveled down the bed of the ancestral Columbia River to the coast. He decided that a "one-vent model" was more likely and that the CRB upon reaching the ocean flowed into the soft muds on the ocean floor and then spewed forth as dikes and sills by hydraulic pressure from a pool below the mud. The "Cape Foulweather Basalt" has been chemically identified as being part of the Ginkgo flow of the Frenchman Springs Columbia River Basalt.

The Niems have been further studying the basalt headlands and have fleshed in details of Beeson's idea. The Ginkgo basalt that comprises Yaquina Head is the result of the flow filling an underwater canyon, probably an outlet of the ancestral Columbia. Where the lava flowed into the water, it broke into quickly cooled fragments that were later cemented together to form the breccia that comprises the base of the headland. Atop the breccia sit monolithic flows that have either colonnade or hackly jointing patterns. Between Otter Crest and Cape Foulweather there are concentric ring dikes visible in the surf.

Between these headlands are outcrops of the Miocene-age Astoria Formation and below that the Nye Mudstone. These are susceptible to erosion and since the layers dip seaward many landslides occur. Atop these is an angular unconformity and horizontal marine terrace layers from the Pleistocene, about 80,000 years old. Erosion is a

real problem to beach-front property owners in Newport. Niem took the GSOC field trip out onto the beach and pointed out all the features in the Otter Crest area.

After a quick bite the group met former DOGAMI landslide and tsunami expert George Priest at the historic Nye Beach turnaround in Newport. Through a steady drizzle the group huddled below the remains of Jumpoff Joe, a headland comprised of the same marine terrace over Astoria over Nye. This feature has eroded dramatically over the last hundred years, and has destroyed one condo project in the recent past. Priest showed the group a landslide hazard map that DOGAMI produced to caution the citizens of Newport from getting too close to the edge of the bluff in their construction projects. Because it has negatively impacted property values in structures perched too close, it is a very sensitive document in the district.

After their all-day drenching, GSOC field trippers either retired to the nearest restaurant or hotel to warm up and dry off. Some of the campers had quite a challenge because their tents were sitting in puddles when they returned to the campground. But the ones that stayed coped with the challenges, and were rewarded with a dry day on Sunday, June 19.

The day began at Yaquina Head. The GSOC group met at the Cobble Beach marine garden area and took advantage of the low tide in the mid-morning. Folks who had been at the previous day's tidepool had tidbits of information on what to look for from Karen Driscoll's tutelage and showed other participants. The Gumboot Chiton was a particularly interesting find, and one specimen ate a hermit crab while we observed it. Coralline algae was abundant in both encrusting and branched forms, as well as green anemone, purple urchins, and purple star. The author saw a sea pen lying with the other kelp and whatnot strewn about in the newly dried beach.

As described by Niem, the headland base was Ginkgo breccia and this was observed by the participants. The cobbles which comprised the beach were weathered out of the breccia and were extremely rounded and polished from the wave action. A bit like walking on ball bearings. A large sea stack of columnar basalt had distinct fan-shaped jointing patterns. Nesting birds crowded atop it included cormorants and common murres.

The last activity done on the trip was a tour of the NOAA research vessel Wecoma stationed in Newport and the recently opened NOAA headquarters there. Able Seaman Patrick Breshears took the GSOCers aboard for the tour, and showed them the laboratories, research and hoisting equipment, ship's engine, decks, quarters, galley and the control room. Breshears had grown up in Burns, but took to sea at a young age and loves his work.

GSOC members had a very memorable trip and wish to thank Janet and all the other guest speakers for their time and effort.

Additional Reading:

Oregon Coast National Wildlife Refuge http://www.fws.gov/oregoncoast/wildlife/seabird.htm#5

Geological Society of the Oregon Country Activities:

ANNUAL EVENTS: President's Field Trip—Summer or Fall; Banquet—March; Annual Business Meeting—February.

FIELD TRIPS: About 4 per year. Fees: see field trip announcements on the calendar next page.

GSOC LIBRARY: Rm. 69, Cramer Hall, Portland State University. Open 7:00 p.m. prior to meetings.

PROGRAMS: Second Friday evening most months, 7:30 p.m., Rm. S17, Cramer Hall, PSU, SW Broadway at SW Mill St., Portland, Oregon.

MEMBERSHIP: Per year from January 1: Individual--$25, Family--$35, Junior (under 18)/Student--$15. Membership applications are available on the website www.gsoc.org.

PUBLICATIONS: THE GEOLOGICAL NEWSLETTER (ISSN 0270 5451), published monthly and mailed to each member. Subscriptions available to libraries and organizations only at $20.00 per year. Single Copies are available at $2.00 each. Order from:

Geological Society of the Oregon Country, P.O. Box 907, Portland, Oregon 97207

TRIP LOGS: Write to the same address for names and price list.

APPLICATION FOR MEMBERSHIP
THE GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Name_____ **Spouse**_____

Children under age 18_____

Address _____ **City** _____ **State** ___ **Zip**_____-_____

Phone (_____**)**_____-_____ **Email address**_____

Geologic Interests and Hobbies_____

_____

Please indicate Membership type and include check for appropriate amount:

Individual $25.00 _____ **Family $35.00** _____ **Student $15.00** _____

Make Check Payable to: **The Geological Society of the Oregon Country**
PO Box 907
Portland, OR 97207-0907

The Geological Newsletter

"News of the Geological Society of the Oregon Country"

Volume 77, Number 6
November/December 2011

The Geological Society of the Oregon Country
P.O. Box 907, Portland, OR 97207-0907
www.gsoc.org
2011 - 2012 Administration:
President:
Rik Smoody - 360/546-2019
science@smoo.com
Vice-President:
Jane Walpole – 503/590-7501
antjane@aol.com
Secretary
Paul Edison-Lahm – 971/404-6064
edisonlahm@comcast.net
Treasurer
Richard Bartels – 503/292-6939
bartbartels@comcast.net
Directors:
Anne O'Neill (1 year) - 503/477-7827
a.oneill@yahoo.com
Dawn Juliano (2 years) - 503/367-7708
dawnmj_2000@yahoo.com
Julia Lanning (3 years) – 503/201-8022
julia@julialanning.com

Past Presidents:
Larry Purchase – 360/254-5635
lkpurchase@q.com
Carol Hasenberg – 503/522-4249
csh727@comcast.net
Newsletter Editor and Calendar:
Carol Hasenberg – 503/522-4249
csh727@comcast.net
Website:
Janet Rasmussen – 541/753-0774
jkayerocks@yahoo.com
Business Manager:
Jan Kem – 503/799-6871
jankem39@comcast.net
Assistant Business Manager:
Anne O'Neill - 503/477-7827
a.oneill@yahoo.com
Field Trip Committee Chair
Dave Olcott– 503/695-5219
daveolcott46@yahoo.com

VISITORS WELCOME AT ALL MEETINGS

CALENDAR

November/December Activities

Friday evening talk, November 11, 2011, at 7:30 p.m., in Room S17, Cramer Hall, 1721 SW Broadway Ave. (between Montgomery and Mill Sts.), Portland State University. Speaker Scott Burns, Portland State University professor of Geology, will present "The Geology of Our National Parks".

GSOC Annual Christmas Party

GSOC Members and their guests are invited to the GSOC Annual Christmas Party and field trip slideshow, Friday December 9th, 2011 at the Simon Benson House on the Portland State University Campus, 1803 SW Park Avenue at Montgomery Street corner. Ham will be served. Members please bring vegetable, side dishes or desserts for 6 to share. Those interested to bring wine, soda or table ware please contact Anne O'Neill (503)200-9308. Donations will be accepted for the room rental.

Schedule of Christmas Party activities:
6:30 p.m. Dinner buffet
7:30 p.m. Year in Review. This year's GSOC field trip leaders will present slide shows of their trips:

- Dave Olcott, "Globally Renowned Neogene Floods; May 20-22"
- Past President Janet Rasmussen, "Tidepools, Tsunamis, and Terraces; June 17-19"
- Secretary Paul Edison-Lahm and Past President Clay Kelleher, "A Geological Walking Tour of Downtown Portland; August 6"
- President Rik Smoody, "Mt. Rainier Aggradation; August 12-13"

8:30 p.m. Cookies/dessert

Musicians are encouraged to volunteer for the GSOC Christmas Chamber Players who play during the party; contact Dawn Juliano (503)367-7708. Dressy apparel for the evening is encouraged.

If you would like to come but are not yet a member of GSOC, you may join now and receive membership benefits throughout 2011.

Future Activities

Friday evening talk, January 13, 2012, at 7:30 p.m., in Room S17, Cramer Hall, 1721 SW Broadway Ave. (between Montgomery and Mill Sts.), Portland State University. Speaker TBA.

Check the GSOC website (www.gsoc.org) for updates to the calendar.

BOARD MEETING NOTES

September 10, 2011

The meeting was called to order by President Rik Smoody at the Smoody residence. Board and GSOC members present also included Jane Walpole, Paul-Edison Lahm, Richard Bartels, Dawn Juliano, Anne O'Neill, Dave Olcott, and Antonella Mancini.

Field Trips and Other Events

Downtown Portland Geology Tour:

Paul thanked all who volunteered to help at the last minute as the number of tour participants swelled. The folks at Fossil Cartel are excited to work with us again on the next walk.

President's Field Trip:

Rik reported that his trip was blessed with good weather, excellent speakers and gorgeous views of Mt. Rainer's glaciers, dams and aggradation. The guide used for the trip, Pat Pringle's Roadside Geology of Mount Rainer National Park and Vicinity, is highly recommended for anyone wanting to take a self-guided tour.

Upcoming Field Trips:

Jane and Janet are looking into a less structured self-guided trip to the Wallowas for next year. For her anticipated President's Field Trip, Jane is looking into planning a three day event in the Portland area that would draw in members who might not otherwise go on the longer overnight field trips.

Dave is working on a possible "Geology of the Portland Basin" field trip with Terry Tolan. Bev and Bart may plan a two-day trip to the Crooked River calderas.

The board decided on a tentative schedule of next year's events:

- Jane's Portland area trip August 2012
- Dave's Portland basin trip September 2012
- Paul's walk for July/August 2012

It was also agreed that Larch Mountain should again be the site for the annual picnic.

Upcoming Speakers (Jane):

Roger Dellinger will be speaking at the October lecture on computer models for Iceland and Missoula floods. Scott Burns will be speaking on National Parks in November. Speakers for January and February 2012 remain TBA. Rik is also looking for a speaker for the annual banquet in March.

Holiday Banquet (Anne): the contract has been signed with Portland State for use of the Benson House for the holiday banquet. Dinner will be a general potluck (rather than arbitrarily assigned by last name) and served prior to the dessert course. Anne will bring spiral ham. Musicians interested in performing should contact Dawn. Donations will be accepted.

Old and New Business

Nominating Committee:

Rik will be appointing the nominating committee for next year's officers.

Mug Sales and Inventory:

A mug was presented to the speaker at the Friday lecture, and a number of mugs were sold to the audience members.

Newsletter:
The board decided that alternate month mailings will be eliminated in 2012, reducing to six the annual number of newsletters.

Website/Internet committee:
Minutes are now available for board members online. Please contact Paul if you are a GSOC member and wish to read the unabridged board meeting minutes.

Next Board Meeting will be Saturday, November 12, 2011, 10:00 a.m. at the Vogt/Bartels' residence. Meeting Adjourned.

edited from the meeting minutes provided by GSOC
Paul Edison-Lahm, Secretary

SMUG MUGS

GSOC is proudly selling its new logo mugs. The mugs feature a GSOC logo on each side of the cup, plus the statement 'Supporting Geology in the Pacific Northwest since 1935' and the website address 'GSOC.org' opposite the handle. Pricing schedule is $7 each, two for $13 and four for $25. Contact Richard Bartels or Carol Hasenberg for more information.

OWYHEE CANYON ADVENTURE

Synopsis of the October 14, 2011, lecture by Cynthia Hovind, Geotechnical Engineer, Principal, Terra Dolce Consultants, Inc.
by Carol S. Hasenberg

Earlier in the year professional engineer Cynthia Hovind got a rare opportunity to visit one of the most remote, beautiful, and geologically interesting corners of Oregon when she got invited to join a rafting expedition down the Owyhee River. Not only that, but she was hired to explain the geology to a group of Road Scholars (formerly Elderhostel) while doing the trip. The trip had only one drawback and that was that it was cold enough to be snowing the first day of the trip, then gradually warmed as the trip progressed.

To do the job of interpreting the geology of the area, Cynthia turned to Owyhee River basin geology expert Kyle House, currently of the USGS office in Flagstaff, Arizona, who has been mapping some of the geological units in the area since 2007. Kyle has been overlaying his work onto geologic maps of the area and was able to give Cynthia the history of the basin for the last 15 million years.

The Owyhee River is a 350-mile long tributary of the Snake River and occupies the remote southeast corner of Oregon. According to Orr and Orr, the Owyhee uplands has a geology that is unique and different from that of the adjacent Basin and Range province to the west. Rather than alternating high and low blocks resulting from crustal extension, this highland was formed by volcanic activity beginning in the Miocene about 15 million years ago. Geologists have concluded that this activity was produced by the same hot spot that is now located beneath Yellowstone National Park.

Three Miocene sources that have been mapped in the Owyhee uplands include the Mahogany Mountain Caldera, the Three Fingers Caldera, and the Saddle Butte Caldera. Both rhyolitic and basaltic flows came from these sources.

After a period of volcanic quiescence and erosion, the area was again the scene of much volcanic

activity in the Late Cenozoic, about 1.8 million years ago. Many Late Cenozoic lavas have been mapped by House, including the Bogus Rim, Greeley Bar, Clarks Butte, Saddle Butte, West Crater, Rocky Butte, and Coffee Pot lavas. These flows were responsible for repaving the plateau by producing a capping basalt layer, damming the Owyhee River in several places forming lakes that are now breached, and failing the sides of the canyon in massive landslides.

After the Miocene volcanics and until about 8 million years ago, there were also a number of lakes in the area created in crustal extension basins in which a lot of volcanic sediments were deposited. The many layers of volcanic lava that can be seen in the sides of the canyon alternate with the massive lake bed deposits, making the Owyhee canyon one of the most spectacular and varied geological wonders of the state.

Floating down the river to enjoy the astonishing beauty, the Road Scholars group encountered a number of rapids, hot springs, and old farms which have been "grandfathered" into the Wild and Scenic River. The low point of the trip for Hovind was getting thrown from the raft in the Bulls Eye Rapids and being rescued about a half of a mile downstream. Due to its flow characteristics the river is not runnable in hot weather, so the trip occurred in the early part of May which is still pretty cold in that region.

Nevertheless the rafting expedition enjoyed the variety of sights to be seen along the river. In the Rhyolite Canyon, twisted and folded rhyolitic flows formed the canyon walls. The Weeping Wall featured pillow basalts where the Saddle Butte lava flowed into a lake. Polished boulders that were thrown downstream from the lava dam breaches dotted the riverbanks in places. The canyon had beautiful colors, and in places where basalt dikes cut through lakebed sediments the patterns were dazzling. Hoodoos, pillars, and basalt columns were found in many areas.

Highlights of the trip were shown to the GSOC group in a slide show that demonstrated Hovind's remarkable photography skill. All in all it is a raft trip we're sure she'll never forget.

Additional Reading:

Cynthia Hovind's Geotechnical Engineering site: http://www.terradolceconsultants.com/

Cynthia Hovind's photography site: http://www.terradolcephotography.com/

Kyle House's blog with lots of geologic maps: http://owyheeflotsam.posterous.com/

Geology of Oregon, 5th ed., by William N. Orr and Elizabeth L. Orr, Kendall/Hunt Pub. Co., 1999.

Learn More About Oregon's Geology web page: http://www.oregon.gov/DOGAMI/learnmore/learnmore.shtml has a map showing the geologic provinces of Oregon (from Orr and Orr).

Owyhee Wild and Scenic River BLM site: http://www.blm.gov/or/resources/recreation/site_info.php?siteid=317

OPB recently showed some film footage of Leslie Gulch and Mahogany Mountain in the airing of Oregon Field Guide on October 20, 2012, and this episode is available on the OPB website (www.opb.org). Ellen Morris Bishop was the field trip leader on the filmed expedition.

SAVING THE OLD BRINY

Synopsis of the September 9, 2011, lecture by Dr. Douglas Larson, limnologist and writer based in Portland, Oregon
by Carol S. Hasenberg

Dr. Larson has made quite a splash in the Pacific Northwest by studying the history, ecology, and conservation of lakes in the region. He spoke to GSOC four years ago about the origins of lakes in Oregon (see reprinted article below), and mentioned in passing the work he had been doing at Mt. St. Helens and Crater Lake. More recently he has been

studying Lake Abert, a remnant of the enormous Ice Age Lake Chewaucan in the basin-and-range geological province of south-central Oregon.

Larson has taken up the cause of saving Lake Abert, which has few defenders as it is largely in human terms a non-resource lake. It is intensely saline, lacks any shade in the vicinity, has a brutal desert climate, and the area "teems with rattlesnakes" – an inhospitable place. Yet, it also teems with migratory birds which come to nest and feed on brine shrimp and alkali flies when the salinity of the lake is optimal for the growth of these organisms. The problem occurs when the lake's supply of fresh water to provide optimal-habitat conditions is reduced. Maintaining lake elevation between 1,452 and 1,458 feet is essential for optimal salinity.

Larson briefly reviewed the history of Lake Abert since the arrival of Europeans to the area and their interaction with the lake. The earliest reference to the lake was made by Hudson Bay employees who dubbed it "Salt Lake" in 1832. In the 1840's, Captain John Fremont visited the lake as part of his survey of the Oregon Territory and named it after his boss, J. J. Abert. Larson noted that Lake Abert is the only lake whose sketch is shown in the monumental G. Evelyn Hutchinson's *A Treatise on Limnology*, a 4,000-page bulwark of the profession.

Since that time, there have been a number of ideas and attempts to develop the lake for human needs:

- generating electricity by installing a pump-storage hydro-electric plant
- mining the lake for salt
- diverting water for irrigation from the Chewaucan River which feeds the lake
- building a dam for irrigation on the Chewaucan River
- stocking the lake with fish (which immediately died) from the Salton Sea
- conducting explosions in the lake to see how seismic waves work (Fortunately, this plan was not implemented.)
- harvesting brine shrimp for aquaculture and tropical fish food, a practice that scientists claim has no adverse effect on lake biota.

Larson and Dr. Ron Larson of the U.S. Fish and Wildlife Service have prepared a paper, titled "Lake Abert: Salt lake in the high desert," which will be published in the Winter 2011-2012 issue of *Lakeline* magazine, the journal of the North American Lake Management Society.

In studying the lake's water budget, Larson utilized records from the Chewaucan River gauging station located in Paisley, which has kept records since 1912. Other gauging records from a site in the marshes closer to the lake were used to compare how much water has been diverted for irrigation. Between 1912 and 1991, an average of 105,000 acre-ft of water flowed past Paisley per year but only about an average of 62,000 acre-ft made it to the lake. This loss is overwhelmingly due to irrigation use. Other water sources such as direct precipitation on the lake account for an additional 8,000 acre-ft per year. The lake loses 40 inches of water per year to evaporation. There is virtually no seepage loss due to a deep, mineralized,"hard pan" layer that seals the basin bottom.

The elevation of the lake has fluctuated dramatically over the past century. The lowest recorded elevation was 4246.6 ft. during 1924-1937, when the lake was dry or nearly dry. By 1958 the lake had swelled to an elevation of 4260.5 ft. with an area of 64 sq.mi. and a volume of 360,000 acre-ft. In 2009 the lake's elevation was 4248 ft., with a 39 sq. mi. area and a volume of 59,000 acre-ft. Correspondingly, salinity has fluctuated with the amount of water available to dilute it. The salinity has been measured as high as 200 g/L (32g/L is normal for the ocean). Brine shrimp need a salinity of 30-80 g/L to thrive.

The input of water to the lake from the Chewaucan River has declined significantly since the 1950's, and Larson hopes that his efforts will help to convince the public about Lake Abert's importance. In 1991, the State of Oregon and the federal government authorized a private developer to further impound the Chewaucan River with a higher earth-filled dam. The dam further depletes flows in the river, thus jeopardizing lake biota. Larson believes that the dam should be removed, thus

freeing the river and saving one of the world's great saline lakes.

Additional Reading:

For more information about Larson's life and work on Lake Abert and other lake ecology studies, see Oregonlive.com article from February 2011, Craterlakeinstitute.com, Craterlakeinstitute.com and Americanscientist.org articles. Also see the December 2007 issue of *The Geological Newsletter* for "Doug Larson Gives GSOC a Tour of Lake Origins," an article about a previous lecture to GSOC by Dr. Larson.

Oregon Field Guide episode of Lake Abert reviews Keith Kreuz's brine shrimp collection and the lake ecology and conservation:
http://www.opb.org/programs/ofg/segments/view/1121

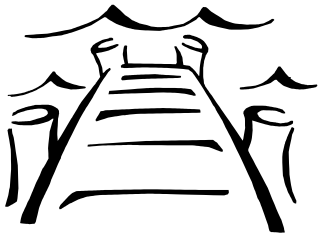
Wikipedia page "G. Evelyn Hutchinson", the "father of American limnology":
http://en.wikipedia.org/wiki/G._Evelyn_Hutchinson

Keith Kreuz's brine shrimp business website:
http://www.oregondesertbrineshrimp.com/

Oregon tui chubs paper:
http://www.fs.fed.us/pnw/publications/pnw_gtr405/pnw_gtr405_65.pdf

DOUG LARSON GIVES GSOC A TOUR OF LAKE ORIGINS

Reprinted from The Geological Newsletter, Volume 73, Number 12, December 2007.



"The Origin of Lake Basins in the Pacific Northwest" was the topic of a slide show by Dr. Doug Larson, an independent scientist and writer, presented on the November 9, 2007, GSOC Friday night meeting.

Editor's recommendation: Have a copy of the DeLorme Oregon Atlas & Gazeteer, or similar publication, on hand when you read this article.

The GSOC Friday night meeting crowd was entertained last month by Dr. Doug Larson and his discussion of lake origins in Oregon and Washington. Dr. Larson studied the recovery and formation of lakes in Mt. St. Helens National Monument for the Army Corps of Engineers after the eruption in 1980. He monitored the evolution of Spirit Lake during that time as well as the formation of Coldwater and Castle Lakes. These lakes were all formed by mudflows from the volcano which blocked water drainage out of low areas. Spirit Lake formed 3000 years ago but its latest location and size are due to the massive 1980 landslide which triggered the eruption.

After discussing his work at Mt. St. Helens, Dr. Larson headed south to discuss lake origins in southern Washington. He mentioned both Battleground Lake and Vancouver Lake. Battleground Lake is really unique in origin and shape – it has "bull's eye" contours (refer to the USGS-CVO website for maars and Battleground Lake). Vancouver Lake, a cutoff channel created from the Columbia River, received 20 million dollars to rehabilitate as part of the Clean Water Act – the largest such grant in the U.S.

Next Dr. Larson took the GSOC audience on a trip around Oregon, reviewing some origins of major groups of lakes. On the central Oregon coast near Florence and Reedsport, the lakes have been formed by rising sea level and sand dune encroachment. Because they are impoundment lakes, they have a characteristic branched shape. Most of the lakes are in private hands, and show signs of human interference. Larson showed a slide of Munsel Lake, which has had some sand infill for home sites, and also a slide of the ineffectually tiny buffer zones from clear cuts around Siltcoos Lake, which is a municipal water supply. Clear Lake, another such water supply lake south of Reedsport, is protected much more strictly. Cleawox Lake is also interesting because there a very large sand dune is pinching off a region of the lake due to recreational bathers using it as a slide.

Along the north Oregon coast one finds lakes in interdunal swales. Examples of this are Coffenbury Lake and Crabapple Lake at Fort Stevens State

Park. These lakes are long and thin and parallel to the shoreline. In the Coast Range, Dr. Larson noted two lakes created by landslides -- Triangle Lake west of Eugene and Loon Lake east of Reedsport.

Moving inland, Dr. Larson mentioned a number of oxbow lakes in the Willamette valley near Harrisburg, Oregon. These lakes were created by neck cutoffs and chute cutoffs as the Willamette River abandoned its curvy path in favor of a more direct route as it meandered across the flood plain.

Next Dr. Larson described a number of truly spectacular lakes in or near the Cascade Range of Oregon. By any standard Crater Lake, in a collapse caldera with water about 2000 feet deep, is one of the world's most spectacular lakes. Larson compared it to a lake in northern Quebec created by a meteorite strike, which would be a real "crater" lake. Newberry Crater is another caldera (not crater) lake system containing East Lake and Paulina Lake, separated by a cinder cone. Diamond Lake between Mt. Bailey and Mt. Thielsen was formed by lava flows and glacial action. Odell Lake, a glacial trough, is a very fine kokanee lake.

Waldo Lake, a large lake southeast of Eugene near Willamette Pass, is very special. Waldo Lake is a very oligotrophic lake with about 150 foot clarity. The water chemistry of the lake approximates that of distilled water. Motorboats have been outlawed on the lake, which cannot be stocked because there is no food source for the fish (oligotrophic means the water has few plant nutrients). The bottom of lake is covered with moss and liverworts.

Moving to northeast Oregon, Dr. Larson showed in an airphoto that Wallowa Lake, with its lateral and end moraines, is a glacial trough. He also described glacial cirque lakes in the Wallowa Mountains. Then in a southward move, Larson mentioned Malheur Lake and Harney Lake, ice age (pluvial) lakes which emptied into the Snake River during their heyday. About a dozen small lakes are all that remains of the pluvial lake in Warner Valley, which formed in south central Oregon's basin and range topography. The region also boasts Lake Abert, a tilted fault block lake, and Summer Lake, an evaporation basin.

Near the end of the talk Dr. Larson mentioned manmade lakes in Oregon, but as he pointed out, the word "lake" is a misnomer applied to these reservoirs of water. Now that we have been shown around the state by Dr. Larson's lake tour, we should have a new appreciation for how lakes originate in our state. We can consider how the geology of the area affects the creation and shape of a lake.

Carol Hasenberg

References and Additional Reading

Johnson, Daniel, and others, Atlas of Oregon Lakes, Oregon State University Press, Corvallis, Oregon, 1985, 314 p.

Geological Society of the Oregon Country Activities:

ANNUAL EVENTS: President's Field Trip—Summer or Fall; Banquet—March; Annual Business Meeting—February.

FIELD TRIPS: About 4 per year. Fees: see field trip announcements on the calendar next page.

GSOC LIBRARY: Rm. 69, Cramer Hall, Portland State University. Open 7:00 p.m. prior to meetings.

PROGRAMS: Second Friday evening most months, 7:30 p.m., Rm. S17, Cramer Hall, PSU, SW Broadway at SW Mill St., Portland, Oregon.

MEMBERSHIP: Per year from January 1: Individual--$25, Family--$35, Junior (under 18)/Student--$15. Membership applications are available on the website www.gsoc.org.

PUBLICATIONS: THE GEOLOGICAL NEWSLETTER (ISSN 0270 5451), published monthly and mailed to each member. Subscriptions available to libraries and organizations only at $20.00 per year. Single Copies are available at $2.00 each. Order from:

Geological Society of the Oregon Country, P.O. Box 907, Portland, Oregon 97207

TRIP LOGS: Write to the same address for names and price list.

APPLICATION FOR MEMBERSHIP
THE GEOLOGICAL SOCIETY OF THE OREGON COUNTRY

Name_____ **Spouse**_____

Children under age 18_____

Address _____ **City** _____ **State** ___ **Zip**_____-_____

Phone (_____**)**_____-_____ **Email address**_____

Geologic Interests and Hobbies_____

_____

Please indicate Membership type and include check for appropriate amount:

Individual $25.00 _____ **Family $35.00** _____ **Student $15.00** _____

Make Check Payable to: **The Geological Society of the Oregon Country**
PO Box 907
Portland, OR 97207-0907