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This Issue Includes:

Highlights of the 2010 PNW Annual Meeting, ID

New Section Officers

Opportunities for K-12 educatorsand of course, more!



From the President

It's hard to believe that the section resuscitation took place over a decade ago, with the 1999 conference in Spokane. It is an honor to take over the presidency of the Pacific Northwest section, following in the footsteps of Jenny Thomson, Andy Buddington, and most recently Ralph Dawes. For a number of years now Cassie Strickland has been putting together a visual extravaganza of a newsletter. One of the evolutionary changes that has taken place, however, involves the newsletter content. At one point, the newsletter provided an outlet for snippets and highlights of section member research. It also provided a good overview of events taking place around the section from conferences to meetings to lectures. Much of that yeoman work in recent years has been picked up by Cassie as newsletter editor. It's time for the rest of us to forward that information rather than making the editor surf the web tracking down details. I know that we are all presently trying to do more with less, but take a minute and consider if you have something beneficial to contribute to the newsletter, or section as a whole.

So here's my snippet of the moment. As a section, our numbers have changed pretty dramatically between 2007 and 2010. Comparing the 2007 list to 2010, we lost 74 members (now 73-yours truly overlooked his membership last year). If you haven't been getting an email blast, you may be in the same boat! On a positive note, there were 30 new members in 2010 that weren't on the 2007 list. So, in the coming weeks I'll be working at contacting some of the lost members and see if we can bring them back into the fold. As section members, consider if you know some folks that should be section members and potential assets to our organization. I know in Coos County we have the "Usual Suspects" when it comes to non-profit community organizations. The Pacific Northwest Section of NAGT does as well. Now is the time to expand that list. If you have any ideas, questions or concerns let me know. Just be forewarned, I may ask you to help institute those ideas. I'm looking forward to a productive year and seeing many of you at Malheur in June. Oh, by the way, I already renewed my NAGT membership for next year... ---Ron

State by State:

British Columbia, Yukon, Idaho, Oregon & Washington

British Columbia- Nothing to report.

Brett Gilley & Tark Hamilton, State Councilors

Alaska

Cathy Connor, Michael Collins, State Councilors

★ **Teacher Opportunities** from Alaska Resource Education: Upcoming Events - One Graduate Credit offered: Soldotna: October 21st – 23rd, 2010; Homer: November 18th-20th. Please contact the Alaska Resource Education for more information on upcoming classes and available graduate credits.

www.ameref.org

State by State continued: Alaska

- ★ **DGGS Alaskan Volcano Card Decks available now.** We think it's no coincidence that there are exactly 52 historically active volcanoes in Alaska and we hope to engage the user in a fun, educational experience. Each full-color card provides the location coordinates and photo of the volcano, and up to six colored dots that correspond to a legend on one of the joker cards. The dots represent characteristics of the volcano, such as a documented eruption, fumaroles, deformation, or earthquake swarms. Card decks can be purchased at the **Alaska Division of Geological and Geophysical Surveys** office in Fairbanks, or ordered online through the DGGS website at : www.dggs.dnr.state.ak.us/pubs/pubs?reqtype=citation&ID=20401
- ★ **Alaska Science Consortium Summer Institute.** ASCS offers an intensive two-week Summer Institute followed by a distance delivered follow-up course in the fall. Grade level sessions assure attention to developmental considerations and content needs. Led by ASC master teachers, the Institute blends science content taught by scientists, with science instructional strategies. Participants are required to earn university credit for both the Summer Institute and the distance-delivered follow-up course in the fall. During the Summer Institute, participants are expected to fully immerse themselves and work diligently at expanding their science teaching abilities. Class runs from 8:00 to 5:00, five days a week, and will include occasional evening sessions and class-related trips. For further information about the Summer Institute and the distance-delivered follow-up course in the fall, contact **Sandi Schultz**, ASC Coordinator at sandischultz@starband.net or at 907-895-4368.
- ★ **Alaska Resource Education Kits.** Alaska Resource Education provides educational materials, in the form of Alaska Resource Kits, to Alaskan educators free of charge. The kits contain nearly \$400 worth of materials to help provide students and teachers with balanced information about Alaska's rich heritage with mineral, energy, and forest resources. The kits have been accepted in all of Alaska's 53 school districts. Over 200 kits are distributed each year and over 1,500 Alaskan educators currently use the kit's materials. The kits are so flexible they are used in classrooms from kindergarten through high school for science, math, social studies, Alaska studies and other subjects. Kit materials include samples of oil, minerals, and rocks indigenous to Alaska, videos, an interactive CD, posters, maps, reference books, Sitka spruce cross-sections, and hundreds of lesson plans and learning activities. If you are an Alaskan educator, please request a kit by contacting us at: Alaska Resource Education, 4141 B Street, Suite 402, Anchorage, AK 99503, www.ameref.org

Idaho

State Councilor: Shawn Willsey

- ★ **36th Annual Tobacco Root Geological Society Field Conference, July 28-31, 2011.** Superior, Montana. <http://trgs.org>

Oregon- nothing to report

Tom Lindsey, State Councilor

Washington

Joe Hull, Jeff Tepper, and Sian Davies-Vollum, State Councilors

- ★ **Weekly Environmental Science Seminars,** University of Washington-Tacoma, held weekly from 12:30 - 1:30 on Mondays in room 309 of our Science Building. The list of remaining talks this quarter is given below. A campus map is at www.tacoma.washington.edu/campus_map. All are welcome.

Nov 22: Panel Discussion (City of Tacoma, Pierce County and WSU Puyallup) Stormwater/Low Impact Development in Tacoma

Nov 29: Amy Merten (NOAA) Managing Information in Real - Time for the Deepwater Horizon Oil Spill Real

Dec 6: Bill Smith (City of Tacoma) Solid Waste, Sustainability and Climate Change in Tacoma .

2010 PNW Section Elections

Pacific Northwest NAGT section elections were held in Spring 2010. Winners were announced at the annual section field conference (Twin Falls, ID, June 2010). Here is a summary of the election results (President is not voted on; the previous election's VP is automatically raised to section President).

Vice President- Cassandra Strickland

Secretary/Treasurer- Bob Christman

Newsletter Editor-Cassandra Strickland

State Counselors:

Oregon- Tom Lindsay

Washington-Joe Hull, K.Sian Davies-Vollum, Jeff Tepper

Idaho- Shawn Willsey

Alaska- Cathy Connor, Michael Collins

British Columbia- Brett Gilley, Tark Hamilton

Congratulations to our section winners.

In the Trenches:

A New NAGT Publication Coming Jan 2011

Andy Buddington, Spokane CC

In January of 2011, a new NAGT publication will hit the press!

In the Trenches will be offered in both hard copy and digital form and is "designed to provide a forum for geosciences education dialog targeting educators in the classroom." The members of NAGT voiced a significant demand for such an "informal outlet" of teaching ideas and experiences that can benefit the broader geosciences teaching community. **David Steer** of the University of Akron and Past President of NAGT is the brainchild of this new publication and will serve as editor. David is presently soliciting suggestions for future articles and pieces. If you are interested in participating in any way, contact David at steer@uakron.edu. For more information on this exciting new publication, see David's short discussion in the September 2010 NAGT e-Newsletter at <http://nagt.org/nagt/enews/sep2010.html>.

National NAGT Liason Update

By Andy Buddington, Spokane CC

Here's an update from your Pacific Northwest Section liaison. The Pacific Northwest Section continues as one of the more active of the NAGT sections! None can "out do" the Far West Section with their twice-a-year conferences and huge number of field trips (check out their website). We are doing very well, however. It was not only a healthy year financially for our section, but for NAGT in general. Yes, even during these tough economic times, NAGT emerged well in the "black" as an organization for 2010. This welcome development is mainly because of excellent budgetary planning and leadership at the national level. So, NAGT is very much alive and well!

I'm just back from the annual NAGT Executive meeting at GSA (Denver) and I must say there are many exciting things happening with NAGT. Below is a short bullet list of what's going on:

- **Living With Earth: An Introduction to Environmental Geology** by **Travis Hudson** with NAGT & AGI advisory board members. This new text is on the market and sales are starting to do well.
- **JGE goes completely online starting in February 2011.** The four issues per year schedule remains but will be completely online. You can, however, request paper copies for an additional charge to your annual dues.
- **In the Trenches debuts in January 2011.** This digital and paper color journal debuts with the lead article by our own Cathy Conner of the University of Alaska, Juneau. This new journal will focus on short articles presenting teaching strategies and examples that work.
- **The 2YC initiative was proposed** (and accepted by the Executive Committee) for NAGT sponsorship. This group will focus on 2 year college issues and efforts in geoscience education. Contact **Frank Granshaw** (Portland CC) of the Pac NW Section for more info (fgransha@pcc.edu).
- **International expansion of NAGT?** Possibly. There is growing interest for NAGT going international with the development of an International Section including European, Indian, and Australian geoscience educators.

NAGT sponsored programs are also active and numerous: Distinguished Speaker Series, USGS/NAGT Cooperative Field Training, Geoscience Teachers in Parks, Climate Literacy and Energy Awareness Network (CLEAN) Pathway. Go to the following page for a complete list:

www.nagt.org/nagt/programs/index.html

Awards and scholarships continue to be an important part of NAGT with recognition of colleagues and support to students and excellent K12 teachers. If you haven't looked at the national NAGT website and the numerous awards and scholarships available, you should! Nominate an excellent TA for recognition! Recognize an excellent instructor you may know! Spread the word to undergraduates for field camp scholarships! These awards and more can be viewed on the NAGT website:

www.nagt.org/index.html

Finally, there were many (too many to acknowledge individually) excellent technical sessions on geoscience

education including the morning and afternoon sessions chaired by our own **Eric Baer** (Geoscience Programs at Community Colleges: Models for Success and Innovation I & II). For a list on the many NAGT sponsored sessions go to: www.nagt.org/nagt/programs/meetings/GSA10.html, and for abstracts go to the GSA annual meeting final program website at: <http://gsa.confex.com/gsa/2010AM/finalprogram/>

So much is happening with NAGT at both the section and national levels. If you are at all interested in participating at either level, feel free to contact Ron and Cassie, or me, Andy Buddington. Your interest and enthusiasm would be very welcome!

2010 Outstanding Earth Science Teacher Awards

By Deron Carter, Linn-Benton CC

This year's OEST awards go to three state-level winners: **David Gillam** of Anchorage, Alaska, **Kareen Borders** of Gig Harbor, Washington, and **Mike Rockow** of Salem, Oregon. Our Pacific Northwest Sectional winner was **Chris Hedeem** of Oregon City, Oregon.

Our Alaskan state winner, **Dave Gillim**, teaches 6th grade at Nicholas J. Begich Middle School. Dave is highly regarded as a master Earth Science teacher in the Anchorage School District. Recently, as a part of the NSF-funded Experiential Discoveries Geoscience education workshop, Dave guided two 6th graders through a student-designed, GIS, field-based science fair project. This involved being trained in ArcGIS software and using it to analyze data collected from Juneau Icefield glaciers as well as for independent earth science projects during a 2 week summer workshop. Their project was presented at an EDGE workshop and also at the Southeast Alaska Regional Science Fair. Along with leading three of his own summer workshops for Alaska teachers, Dave has also worked as an adjunct professor both at the University Alaska Anchorage and at Alaska Pacific University in Anchorage where he has taught education courses in science for the elementary classroom.

Our Washington State winner, **Kareen Borders**, has taught for over 16 years at Key Peninsula Middle School. She was recently awarded the American Institute of Aeronautics and Astronautics Educator Achievement Award for comprehensive use of Inquiry Science. Kareen has been in the fore front of using cutting-edge technologies to enhance pedagogy in her classroom, including the use of a personal response system and smart boards. Her students are often engaging in discourse with a variety of geoscientists as a part of Pennsylvania State FLEXE: From Local to Extreme Environments project for the past two years. Her students participate in project to communicate with scientists in the field, conduct investigations, compare results with other schools, and analyze their own geoscience environment. Kareen also wrote and won the NASA National Lesson Plan competition for her interactive, immersive lesson, "Hurricane!" from Penn State, University of Washington and NASA. She sets up field research experiences for other teachers, and manages a NASA Explorer School partnership for her school.

The Oregon State winner is **Mike Rockow**, who teaches at Leslie Middle School in Salem, OR. Mike holds a Ph.D in igneous and metamorphic petrology from Washington University, and teaches 8th grade Earth Science. He has been instrumental in developing inquiry-based curriculum at Leslie Middle School in Salem, Oregon. He works with the Oregon State Board of Education on science standards, has served as a reviewer for NSTA, and participates in a variety of workshops and professional development opportunities. Mike has also created a mentor program for 8th grade science students. Each year 30-40 students are teamed with scientists who help he students with the design and logistics of a science research project. Since the inception of this project, the participation of 8th graders from Mike's school in Oregon's state science fair has doubled, as have the number of awards won. This research program was awarded the Oregon Museum of Science and Industry's Middle School Science Research Program of the year in 2007.

The overall Pacific NW Sectional winner is **Chris Hedeon** of Oregon City High School. Chris holds a Masters in Science in Geology from University of Oregon and a Masters of Arts in Teaching from Lewis and Clark College. He has taught for over 10 years and instructs Earth Science and honors geology at Oregon City High School. He brings a breadth of geologic experience to his classroom. Before launching a career in teaching, Chris studied landslide hazards and remediation for the US Forest Service, and his graduate research focused on invertebrate paleontology, stratigraphy, and regional tectonics of the Oregon Coast Range. Most notably, Chris has served as a Master Teacher for the NSF-funded Teachers on the Leading Edge (TOTLE), an Earth Science teacher professional development program highlighting Pacific Northwest regional plate tectonics. In this role, Chris mentors other K-12 geoscience teachers, and has also helped develop regional geologic hazards and earthquake engineering classroom kits that bring experimental setups into TOTLE participant's classrooms. Additionally, he has engineered innovative middle and high school curriculum using real-time EarthScope GPS data to study geologic hazards and tectonics of the Cascadia region which was presented at the 2009 Geological Society of America Meeting. Chris also coordinates an Honors Geology curriculum with Clackamas Community College and consults on Earth Science curriculum development and teacher professional development projects by Biological Sciences Curriculum Studies and Oregon Public Broadcasting. Chris clearly demonstrates the qualities that make him a master teacher in Earth sciences.

Congratulations to all of our OEST winners and nominees. What an incredible year for honoring such outstanding Earth Science teaching!

Highlights of the 2010 PNW Annual Section Field Conference

Twin Falls, ID, June 2010-11-21

By Dr. Ralph Dawes, Wenatchee Valley College

What a great meeting we just had in Twin Falls! **Shawn Willsey** did a tremendous job, from the planning to the publicizing (great

web site!), to arranging for the field trips, including recruiting the field trip leaders, arranging the facilities and talks, and conducting the meeting itself. I think that all who went to Twin Falls should try to make a point of thanking Shawn, if they get a chance.

I was not there for the last two days of field trips, so we'll have to hear, from those who went, what they made of those excursions. The parts of the meeting in which I participated were wonderful. The first field trip, to the Albion Range, took us to what may be the best metamorphic core complex in the world, when it comes to the geomorphology expressing the underlying structural geology, excellent exposures of the rocks, relatively simple stratigraphy to keep track of, and a beautiful shrub steppe to high alpine setting. By best in the world, I mean a core complex that is well enough exposed and expressed on the Earth's surface that even non-geologists could quickly begin to see and understand its geologic structures and stratigraphic relationships. Plus, as **Kevin Pogue**, the main leader of the field trip, focused upon, the Albion Range presents excellent geomorphology, which attracts rock climbers from around the world, and raises research-level questions about how the landforms there have developed.



*Kevin Pogue guides the group at Castle Rock State Park.
Photo by Shawn Willsey, 2010.*

Castle Rock and the City of Rocks are worth making a day's side-trip, anytime one is traveling out to Yellowstone National Park or is otherwise in the area. And we got a geological guidebook, written by Kevin and illustrated with many full-page photographs, as part of our goodies.

The conference day was a fine mixture of professional geology (**John Shervais** made an outline of an argument for the Snake River Plain as a probable mantle plume or hot spot track) and the pedagogy of teaching earth science (for example, the students and the instructor from University of Southern Indiana, who were to some extent trying to measure the efficacy of their teaching models in statistically valid ways, though statistical validity was not yet attained in every case). Dinner that night was on the patio of the Canyon Crest Restaurant and Event Center in Twin Falls, overlooking (seemingly overhanging) the Snake River Gorge and a high waterfall of a tributary stream. A satisfying end to an excellent conference day.



Kevin Pogue (yellow shirt) and conference attendees at City of Rocks. Photo by Shawn Willsey.

As for the geological field trips across the Snake River Plain and portions of the Snake River Gorge in the greater Twin Falls area, which took place on the third and fourth days, I went on the first one only, and it was fantastic. Little did I know how many shield volcanoes exist, not only scattered but also overlapping and coalescing, across much of the Snake River Plain, each marked (or so it seemed, based on our sample) by antennae towers. Then there is the sedimentary evidence of the structurally and environmentally evolving stream systems of the area during the Neogene and Quaternary Periods, ranging from Pliocene Lake Idaho to the late Pleistocene Lake Bonneville flood, with the mantle plume and the Basin and Range evident in the source lithologies and drainage directions, uplifts and subsidence of the land.

I like how **Kurt Othberg** from the **Idaho Geological Survey**, the main field trip leader, did not try to explain much, encouraging us to think about it for ourselves. And of course, there was also a landslide complex, a basaltic tuff cone, and all the rhyolite in the area, including the mislabeled example of Balanced Rock. A highlight was **Shawn** and **Brett Gilley** using duct tape and a felt pen to correct the road sign so it said that Balanced Rock was an erosional remnant of a rhyolite column rather than a basalt column (See top photo to right). Or was it a column of welded rhyolitic ash flow tuff, as **Tark Hamilton** suggested? I did not see fresh enough hand samples to be convinced; either more field investigation, or thin sections, or both, may be needed to know for sure. I love those types of field geology debates, which are testable if one takes the time to investigate further.

To summarize, the meeting in Twin Falls was a great example of why we meet. It provided professional development and sustenance to us as teachers and students of earth science. It enabled us to make contacts with others we could learn from and make friends with and enjoy some time with. It provided us with unique, unparalleled opportunities to learn more about geology by encountering the best possible source of information, the earth itself, in dynamic outdoor settings, some of which are internationally famous for their scenery or unusual geology, but which are not easy to find time to visit, let alone be guided there

by experts. And to some extent it may have rejuvenated us, or possibly even inspired some of us, in our teaching, our research, and our life's work.

It gave me a good feeling to step aside as president after a successful meeting. I was pleased to see that our efforts to get more middle school and high school teachers involved paid off with two OEST winners taking advantage of our grant for their meeting expenses. And I was pleasantly surprised that my efforts to reach out and publicize our meeting to other sections of NAGT, via their newsletters and section-membership-wide e-mailings, paid off, with 6 people from other sections finding out about our meeting, being impressed by **Shawn Willsey** and the **College of Southern Idaho's** web site for the meeting, and coming to join us; this includes the contingent from the University of Southern Indiana.

These two campaigns, 1) to get more schoolteachers involved; and 2) to get more NAGT members from around the country to join our annual section meetings, finally gained some traction, as we saw in Twin Falls. I hope we will keep building on those campaigns. But that's a topic for my next e-mail, which will be more about NAGT-PNW business. Good-bye for now.

--Ralph



Balanced Rock before and after- top photo where Shawn and Brett used duct tape to correct the sign. A few months later, Shawn returned to the site only to find someone had permanently changed the sign to reflect the change! Photos by Shawn Willsey.

Global Ozone Project

*Dr. John Birks
Professor Emeritus, University of Colorado, Boulder*

We are trying to identify schools and teachers who would like to participate in our exciting new project for high school students, the Global Ozone Project or "GO3 Project". In the GO3 Project, students around the world measure ozone and meteorological parameters outside their school and upload their data to an overlay in Google Earth to share with other students, teachers and scientists around the world. We have 18 schools participating at the present time, including 4 international sister schools in Madrid, Moscow, Sydney and Cairo. GO3 students are learning about environmental science while helping create the world's first ground-level ozone database. We expect to have funding for 50 more schools starting this fall. Funding is provided through the GO3 Foundation, a 501(c) (3) nonprofit foundation. To learn more about the project, please see our website and 2-minute video. We have developed a free curriculum that teachers can download as Power Point presentations, and we are working on free online interactive ("Moodle") courses on all of atmospheric science. Each participating school will receive a free instrument package valued at \$5,000. Website: www.go3project.com

NOAA Teacher-At-Sea Program 2011

Michael Collins, AK state councilor

Have you ever thought about shipping out to sea? This National Oceanic and Atmospheric Association (NOAA) program will begin accepting applications for the 2011 field season. The program provides a unique environment for learning and teaching by sending kindergarten through college teachers to sea aboard NOAA research and survey ships to work under the tutelage of scientists and crew. Then, armed with new understanding and experience, teachers bring this knowledge back to their classrooms. The application deadline is **November 30, 2010** –

NOAA's Teacher at Sea Program- accepts applications from currently employed, full-time educators in these categories: K-12 teachers and administrators; community college, college, and university teachers; museum and aquaria educators; and adult education teachers. All necessary travel costs associated with teacher participation in the program are covered by the program. More information is available at <http://teacheratsea.noaa.gov>

Alaska SeaLife Center- Distance Learning

Michael Collins, AK state councilor

Visit Alaska... Virtually! Using live interactive video conferencing equipment your students can expand their scientific experience via live, multi-media presentations. Using inquiry-based learning, each 55-minute conference incorporates current research programs happening right here at the dynamic Alaska SeaLife Center! The materials for each program include a teacher's guide with specific background information and activity ideas, as well as supplies for the session's hands-on activities.

Each session includes hands-on supplies for up to 30 students (additional materials available upon request) and a teacher's guide with background information and ideas for supplemental activities. All programs are designed to align with national and Alaskan academic content standards. For program costs, scheduling, and registration information, and to see a list of all of the K-12 programs, please visit us at our website - www.alaskasealife.org.

NASA Opportunities for K-12 Teachers

Michael Collins, AK state councilor

Two opportunities for K-12 Teachers are coming up. The first is the 2011 Alan Shepard Technology in Education Award. Do you know K-12 teachers or district-level administrators who are making a difference in education through the use of technology? Recognize their achievements by nominating them for the Alan Shepard Technology in Education Award. The Astronauts Memorial Foundation, in partnership with NASA and the Space Foundation, will recognize the accomplishments of one outstanding individual and his or her contributions to lifelong learning through the application of technology in the classroom or professional development of teachers.

Technology personnel and K-12 classroom teachers who have demonstrated exemplary use of technology to enhance learning are eligible for this award. School principals, superintendents or associate superintendents may nominate eligible candidates. The award will be presented in April 2011 at the 27th National Space Symposium in Colorado Springs, Colo. The deadline for applications is Jan. 15, 2011. Questions about this award should be directed to amfreg@amfcse.org. Visit the website at: [www.amfcse.org/Alan Shepard Award/alan_shepard_award.htm](http://www.amfcse.org/Alan_Shepard_Award/alan_shepard_award.htm)

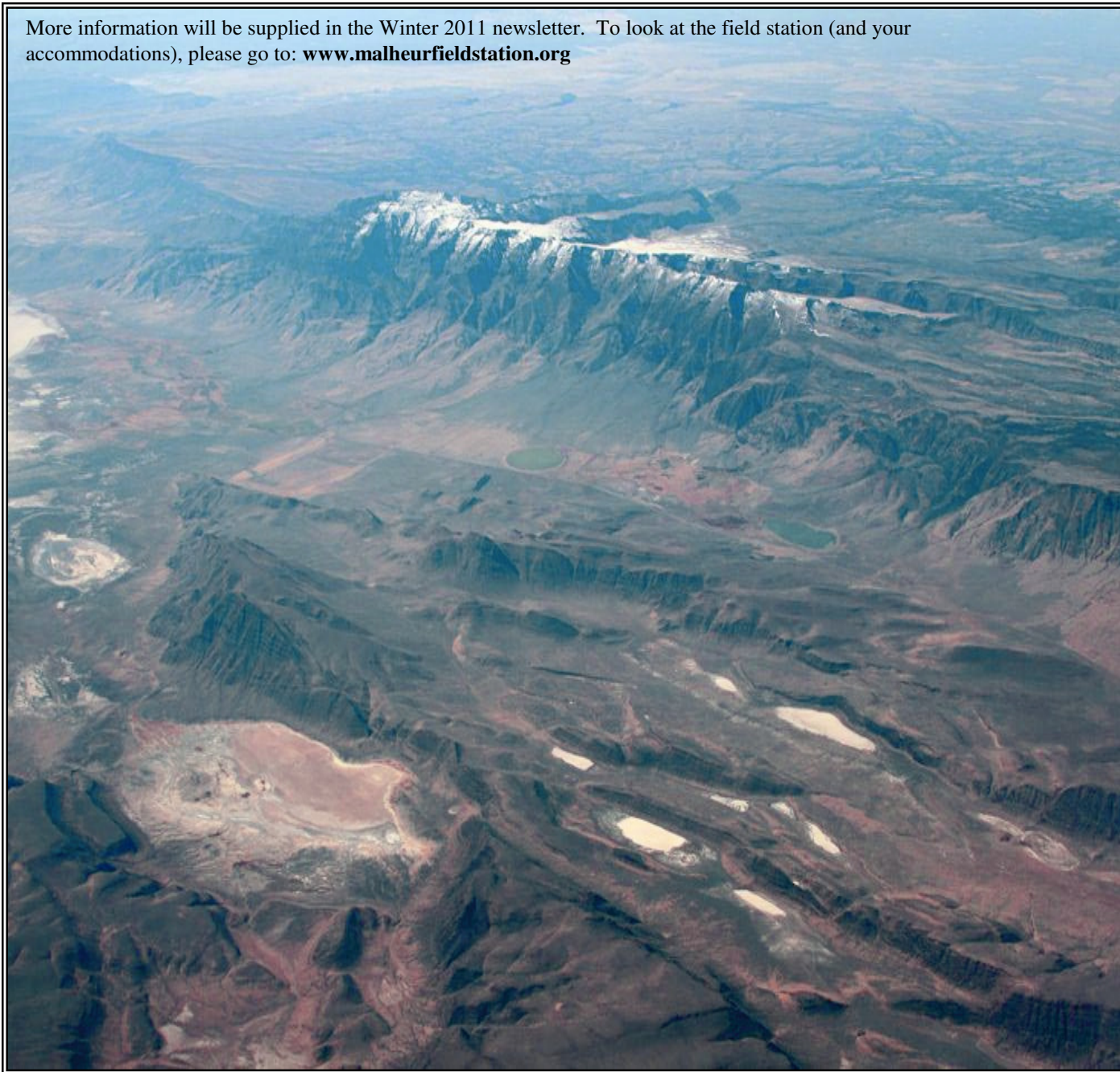
The second opportunity is NASA's **2nd Waste Limitation Management and Recycling Design Challenge**. NASA is inviting students in grades 5-8 to participate in the 2nd Waste Limitation Management and Recycling Design Challenge. The challenge uses real-world scenarios that meet science and mathematics content standards. Students can participate in a formal, informal or home-school setting. Teams of up to six students will design a water recycling system for the unique environment of the moon. Teams will then test their system on a simulated wastewater stream. Proposals and results are **due Feb. 28, 2011**. The winning teams will be announced in May 2011. The top three teams will receive awards. The first place team will receive an expense-paid trip to NASA's Kennedy Space Center in Florida. During the winning team's visit to Kennedy, students will gain firsthand knowledge about NASA's missions, receive behind-the-scenes tours of NASA's launch facilities, and learn about future aerospace and engineering careers. Questions should be directed to **Jay Garland** at jay.l.garland@nasa.gov. <http://wlmr.nasa.gov/>.

2011 PNW NAGT Sectional Field Conference Save the Date: June 22-26th, 2010

The time has come to plan for the 2010 summer sectional conference. After British Columbia in 2009, southern Idaho in 2010, we look to Oregon for 2011. The suggestion of the Malheur Field Station near Burns, Oregon has been proposed and accepted. The Malheur field station is a non-profit center dedicated to the scientific study of the northernmost Great Basin desert. Here is a proposed schedule for the meeting:

- Day 1 (6/22-Wed)- Field trip 1 beginning east of Crater Lake (near Chemult) and working back towards the field station.
- Day 2 (6/23-Thur)- Conference day at station.
- Day 3 (6/24-Fri) - Steen's Mountain Loop field trip.
- Day 4 (6/25-Sat) -Field trip 2 North of Burns, including Glass Butte (mahogany obsidian!).
- Day 5 (6/26-Sun) -Final field trip- Depart station through John Day.

More information will be supplied in the Winter 2011 newsletter. To look at the field station (and your accommodations), please go to: www.malheurfieldstation.org



The Basin and Range Province extends northward into Oregon, as can be seen here in this view south towards Steens Mountain. The frontal fault of the range runs along its eastern base, and in classic tilted fault-block style, the range tilts back away from the fault, towards the west. Steens Mountain consists mostly of Miocene basalt. Photo & Caption by Marli Miller, University of Oregon.