# 2007-2008 Annual Report

# Division of Natural Sciences and Mathematics
# Western Oregon University

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Compiled by

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## 2007-2008 EXECUTIVE SUMMARY

The 2007-2008 academic year was associated with much growth and change in the Division of Natural Sciences and Mathematics (NSM). The biggest advances were linked to the OHSU Nursing Program Package. The development of a satellite OHSU nursing program on the WOU campus provided a catalyst for much growth, expansion, infrastructure development, and general infusion of excitement for faculty and students. Impacts to the Division included pre-nursing enrollment growth, hiring of three new tenure-track faculty in Biology and Chemistry, adding a new lab preparator position, renovations in the Natural Science Building, development of the Math-Nursing Building, and ancillary equipment purchases. At the same time, dedicated faculty and staff advanced other program areas and continued offering high-quality educational opportunities for the greater student population. The following is a summary of program highlights within the NSM division.

### Biology Department

1. Our students (current and former) have been successful in their pursuit of biology-related careers. For example, several were accepted into professional schools and advanced degree programs. At least ten graduates were admitted into medically-related, graduate level professional schools (i.e. medical school, dental school, physician's assistant and pharmacy programs.) In addition, at least one student was accepted to a graduate program in biology, and several other students have contacted us about their success in obtaining biology-related jobs, internships and fellowships, including one 2008 graduate who was awarded a Howard Hughes Medical Institute Summer Research Grant. Nineteen students were accepted into nursing programs.

2. The most significant teaching strides made by our faculty were in the area of laboratory curricula. Several faculty developed new labs or modified existing ones in a significant way, introducing new techniques, technologies and approaches. The net effect is an overall increase in exploratory and research-based exercises that promote experimentation, data analysis and critical thinking. These are key learning outcomes in our mission statement.

3. In terms of scholarship, department members published two papers in peer-reviewed journals, while others have papers in progress. We also gave six refereed papers at national meetings and workshops. Six of eight of these papers and presentations were co-authored by students who contributed significantly to them. One of our faculty members received major grant support from both the National Science Foundation and the Department of Energy for her work in microbiology.

4. Several biology faculty members contributed significantly to the governance of WOU. Most notably, every department member, except one on sabbatical, chaired a major university committee or served as department or division head. Some department members also contributed to the establishment of the OHSU Nursing program at WOU.

6. Biology faculty members continued to provide individualized mentorship and advising geared towards each student's interest and career goals. One of our members received a national advising award. Our department members also continue to serve as the primary

advisors for the Natural Science Club, and undergraduate research is a prominent component of our program.

7. Biology conducted two successful tenure-line searches that resulted in the hiring of two new tenure-track faculty members who will start in Fall 2008: Kristin Latham is our new Developmental/Genetics/Cell Biologist, and Erin Baumgartner is our new Biology Education Specialist. We look forward to working with them and benefiting from their expertise.

8. The Biology Department continued its long-term assessment activities, including the administration of the Major Field Exam for Biology (from the Educational Testing Service) as well as pre- and post-tests in the non-majors biology sequence. We also conducted a department-wide embedded assessment of one of our learning outcomes.

**Chemistry Department**

1. The Chemistry program provides rigorous training for professional scientists, affords students the opportunity to gain direct hands-on experience using specialized techniques, has developed a strong collaboration with the Oregon State Police forensics program, and is experiencing enrollment growth in health science-related service courses.

2. Chemistry graduates continue to find gainful employment in forensics, commercial laboratories, and/or entrance into graduate programs.

3. Chemistry conducted one successful tenure-line search that resulted in hiring a new tenure-track faculty member who will start in Fall 2008: Patty Flatt will be teaching Biochemistry, CH100, and Forensics. Her primary interests are in microbial diversity and natural products biochemistry.

4. The Chemistry Program continued implementing formative and summative assessment techniques that included writing work samples, scientific presentations, independent research on current topics, and completion of the ETS Field Test as part of their senior capstone experience.

**Earth and Physical Science Department**

The Department of Earth and Physical Science consists of two program areas – Earth Science and Physics. The following is a summary of 2007-2008 departmental highlights:

1. Earth and Physical Science faculty members actively served as leaders on a number of campus-wide committees including the Academic Excellence Showcase planning committee and the Program for Undergraduate Research Experiences (Templeton), Academic Infrastructure Committee (Taylor), NSM division representative to the Collective Bargaining team (Schoenfeld), and Curriculum Committee (Myers).

2. Earth and Physical Science faculty members actively served as professional leaders in their fields. Professional service activities include: president of the Oregon Academy of Science (Myers), participation in NASA Oregon Space Grant Program (Schoenfeld),

participation in state-level geoscience advisory boards (Taylor), and collective faculty membership and participation in professional societies (e.g., Geological Society of America, American Geophysical Union, National Association of Geoscience Teachers, Oregon Academy of Science, Great Basin Institute, Paleontological Society, Association of American Geographers, Friends of the Pleistocene).

3. Earth and Physical Science faculty members continue to be actively engaged in a wide spectrum of peer-reviewed research, publication, and related professional development.

4. Earth and Physical Science faculty members continue to actively engage high-quality undergraduate teaching, learning, curriculum development, and program assessment. With 4 tenured faculty and 4 adjunct instructors, the EPS department generated over 8400 student credits hours (SCH) during the 2007-2008 academic year, accounting for 30% of the total production in the Division of Natural Sciences and Mathematics.

**Mathematics Department**

1. The Mathematics Department was nationally recognized as one of the top 10 programs in the area of math teacher education. A recent study by the National Council on Teacher Quality (Greenberg and Walsh, 2008) determined that the WOU math education program is highly robust and making significant contributions in the area of teacher preparation.

2. The Mathematics Department has gone through an intensive self-study process, complete with an external evaluation. As a result, we updated our curriculum and changed the credit structure of the majority of courses. The update will allow us to offer a program that aligns better with the national standards and with our local situation. In addition, we created an Applied Mathematics Track to better prepare students who wish to enter the private sector or graduate study in applied mathematics. The creation of the Applied Mathematics Track, with the associated new modeling course, gives more opportunities for the students to be exposed to applied mathematics, deterministic and stochastic models, and interdisciplinary applications.

3. Fourteen of the Mathematics Department students gave presentations at the WOU Academic Excellence Showcase in 2008. There were also six posters by twelve students in the same event.

4. The Mathematics Department has observed a disparity between the curriculum in the College Algebra course (MTH 111) and the intended outcomes for this course. As a result, the department decided to change the objectives for this course. We have chosen a new textbook, which is highly modeling oriented. Over the last year, tenured and tenure track faculty have exclusively taught this class. For assessment purposes, a common final was created by the faculty teaching the course.

5. The Mathematics Department works closely with the Advising office, Registrar, Division of Extended Programs, and Student Enrichment Program to gauge the need for extra sections of remedial math courses.

## 1. INTRODUCTION

This report provides a summary of 2007-2008 activities in the Division of Natural Science and Mathematics (NSM) at Western Oregon University. The Division is comprised of four departments: Biology, Chemistry, Earth and Physical Science (EPS), and Math. The information contained herein was derived via submission of year-end faculty reports, annual departmental reviews written by Department Chairs, and final compilation by the Division Chair.

For ease of reference, this report is written primarily in "bullet style" and is organized into 10 sections as follows:

## 2. FACULTY AND STAFF

The following is the WOU Natural Science and Mathematics faculty and staff roster for the 2007-2008 academic year.

Staff Members: Sharon Clinton (Chemistry Lab Preparator), Piper Mueller-Warrant (Biology Lab Preparator), Sharyne Ryals (Math Office Specialist), Niki Winslow (NSM Division Administrative Coordinator)

Biology Adjunct Faculty: Karen Bledsoe, Scott MacDonald, Jeff Snyder, Heather Waye

Biology Tenured-Tenure Track Faculty: Sarah Boomer, Bryan Dutton, Irja Galvan, Lonnie Guralnick, Karen Haberman, Mike LeMaster

Chemistry Adjunct Faculty: Tom Barnes, Spence Russell

Chemistry Tenured-Tenure Track Faculty: Arlene Courtney, Rahim Kazerouni, Pete Poston

Earth and Physical Science Adjunct Faculty: Karen Brown, Don Ellingson, Jeremiah Oxford, Grant Smith

Earth and Physical Science Tenured-Tenure Track Faculty: Jeff Myers, Bill Schoenfeld, Steve Taylor, Jeff Templeton

Math Adjunct Faculty: Catherine Aune, Amanda Blaker, Stanley Leung, Sara Short, Dennis Spencer

Math Tenured-Tenure Track Faculty: Cheryl Beaver, Scott Beaver, Hamid Behmard, Laurie Burton, Maria Fung, Klay Kruczek, Mike Ward

The following is a summary of the FTE distribution by department for the 2007-2008 academic year.

| | Adjunct | Tenured-Tenure Track | Staff | %Adjunct FTE |
|---|---|---|---|---|
| Biology | 3.6 | 6.0 | 1.0 | 37.5 |
| Chemistry | 1.2 | 3.0 | 1.0 | 27.8 |
| EPS | 3.8 | 3.0 | 0.0 | 55.8 |
| Math | 3.0 | 7.0 | 1.0 | 30.2 |
| NSM Division | 0.0 | 0.0 | 1.0 | |
| **Total** | **11.6** | **19.0** | **4.0** | |
| | | | **Avg.** | **37.8** |

No. Adjunct Faculty = 16
No. Tenured-Tenure Track Faculty = 19
No. Staff (2 office; 2 technicians) = 4
**Total = 39**

% Female = 43.6 % Male = 56.4

**A special note concerning adjunct faculty and support staff:** while it is recognized that the tenured and tenure-track faculty at WOU represent the long-term investment in successful academic programs and curricula, student achievement would not be possible without the support and dedication of the fixed-term (adjunct) faculty and staff. Their long hours, hard work, dedication, and cumulative years of service to the NSM division are duly recognized and greatly appreciated. We quite simply could not accomplish our mission without their dedicated service.

**3. ENROLLMENT TRENDS**

The Division of Natural Science & Mathematics awarded a total of 40 Bachelor of Science degrees in June 2008, with 3-year averages as follows (numbers are approximate):

| | 2008 | 2007 | 2006 | 3-Yr Avg. |
|---|---|---|---|---|
| Biology | 22 | 18 | 30 | 23.3 |
| Chemistry | 5 | 6 | 8 | 6.3 |
| Earth Science | 4 | 4 | 6 | 4.7 |
| Mathematics | 9 | 7 | 8 | 8.0 |

In addition to the above graduates, the Division had a significant number of students in pre-professional programs that exited the university without degrees as they continued their advanced training at other schools.

Although the numbers varied throughout the academic year as students changed career tracks, the NSM Division supported approximately 350-375 majors and pre-professional students at various stages in their programs. The Division also had approximately 150 minors spread across the different program areas. The following is a census summary of majors and pre-professional students over the past three academic years:

| | 2007-2008 | 2006-2007 | 2005-2006 | 3-Yr Avg. |
|---|---|---|---|---|
| Biology | 110 | 136 | 121 | 122.3 |
| Chemistry | 30 | 36 | 43 | 36.3 |
| Earth Science | 25 | 22 | 21 | 22.7 |
| Mathematics | 40 | 45 | 31 | 38.7 |
| Pre-Professional | 155 | 133 | 130 | 139.3 |

A core component of the academic mission of the science program is supporting general education and the LACC curriculum (ES 100, BI 100, and CH100), which requires significant faculty FTE and academic resources. NSM serviced over 2500 LACC students and 100-level non-majors during the 2007-2008 academic year. The following is a summary of 100-level science enrollments over the past three academic years:

| | 2007-2008 | 2006-2007 | 2005-2006 | 3-Yr Avg. |
|---|---|---|---|---|
| BI100 | 909 | 898 | 1017 | 941.3 |
| CH100 | 261 | 203 | 223 | 229.0 |
| ES100 | 1341 | 1203 | 1336 | 1293.3 |

In terms of total student credit-hour production (SCH), the Division serviced the university community with 27,441 SCH during the 2007-2008 academic year. The following is a summary of total SCH production over the past three academic years:

| | 2007-2008 | 2006-2007 | 2005-2006 | 3-Yr Avg. |
|---|---|---|---|---|
| Biology | 9385 | 8294 | 9679 | 9119.3 |
| Chemistry | 3283 | 2726 | 2828 | 2945.7 |
| Earth Science | 8037 | 7126 | 8032 | 7731.7 |
| Mathematics | 6736 | 7120 | 6994 | 6950.0 |

## 4. TEACHING AND CURRICULUM

### 4A. Curriculum Development

- Scott Beaver (Math) restructured MTH311/312 (Advanced Calculus) based on an inquiry-based learning approach in the pedagogical style of R.L. Moore.

- Cheryl Beaver (Math) used a computer-based, guided-discovery approach in Number Theory this year. The labs were redesigned so that students inquire and discover the significant results in elementary number theory.

- Karen Brown (Earth Science) developed in-class activities and problem-solving exercises. She used these for real-time assessment of student comprehension. She also developed self-directed field trip guides to the western Oregon region for ES100-level students.

- Laurie Burton, Hamid Behmard, Mike Ward, and Klay Kruczek (Math) started a completely new MTH111 curriculum that utilizes modeling as the motivation point for students to learn concepts of college algebra. The curriculum was also employed in pre-calculus (MTH 112) by Hamid Behmard and Mike Ward.

- Arlene Courtney (Chemistry) continued developing multimedia curricula for use in chemistry and general science courses. Her focus has been on utilization of virtual reality and videographic techniques to facilitate learning of fundamental concepts of energy and heat.

- Bryan Dutton (Biology) continued his refinement of laboratory exercises for BI312 (Evolution) with integration of software and computer-based technology. He also invested a significant amount of development time in BI371 (Structure of Seed Plants) to restructure the laboratory and better utilize technology.

- Don Ellingson (Earth Science) incorporated new materials into classroom teaching that included the latest findings of space exploration, reports from the Intergovernmental Panel for Climate Change (IPCC), and current events in Earth System Science.

- Karen Haberman (Biology) continued to further integrate the laboratory component of BI357 (Ecology) with her research on water quality in the Little Luckiamute River. She also modified the writing-intensive portion of this course with an emphasis on research-based scientific writing. This included refinement of the library instructional section in collaboration with our science librarian, Camila Gabaldon-Winningham.

- Rahim Kazerouni (Chemistry) updated experiments in the CH200 sequence to better utilize recently-installed smartlab technology and software applications.

- Michael LeMaster (Biology) developed new laboratories for the advanced and lower division Human Anatomy and Physiology courses. These courses utilized iWorx data acquisition equipment. Although the equipment had been previously utilized for the Human A & P sequence, the use of the equipment in upper division laboratories required the incorporation of more sophisticated techniques (e.g., nerve chambers for experimenting on isolated nerves).

- Jeff Myers (Earth Science) developed a recitation section in ES 453/553 (Geology of the Pacific Northwest). He also produced active-learning in-class activities and detailed PowerPoint presentations for ES331 (Introduction to Oceanography) and ES491/591 (Depositional Systems).

- Pete Poston (Chemistry) updated the CH312 and CH313 curricula to better utilize the PowerPoint software environment and incorporate MatLab software into the labs. He also continued on incorporation of nanotechnology concepts into CH461.

- Bill Schoenfeld (Physics) instituted weekly online graded homework in both the algebra- and calculus-based physics courses. The web-based system gives immediate feedback, and also makes suggestions based upon common student mistakes and misconceptions. Employing this system allowed him to cover more material (especially in the algebra course) than he had in previous years. Since both classes utilized the system, this sometimes allowed students from the algebra and calculus classes to collaborate on assignments.

- Steve Taylor (Earth Science) continued development of multi-media and online resources for a spectrum of Earth Science courses including ES104, ES106, ES202, ES301, ES473, ES476, and ES492.

- Jeff Templeton (Earth Science) completely redesigned his lecture materials for Earth System Science II (ES 105). This entailed the following: (1) full-scale reorganization of the course content, which was aligned to a newly adopted textbook, (2) development of new active-learning strategies that are designed to engage students in larger enrollment lecture classes, and (3) refinement of classroom presentations in which text and graphics are woven together using PowerPoint to create dynamic slide shows. He also played a lead role in redesigning the laboratory materials for Earth System Science II (ES 105) and incorporating electronic measurement sensors.

- Phil Wade (Earth Science) adopted new instructional techniques that included use of American Geological Institute "EarthInquiry" computer modules as assignments in ES100 courses. He also developed energy curricula, in collaboration with Arlene Courtney, for the GS203H class (Honors Science –Alternative Energy).

**4B. Program Changes**

- The Biology program changed the prerequisites for BI318 (Microbiology for the Health Sciences) and modified the pre-professional emphasis within the Biology Major to create more flexibility. Students can now choose to take Bi 334 and 335 (Advanced Human Anatomy and Physiology) or Bi 324 (Comparative Vertebrate Anatomy) and Bi 434 (Comparative Vertebrate Physiology) as part of this emphasis. These changes were approved and adopted in the new 2008-2009 WOU catalog.

- The Chemistry program initiated a number of modifications to 300- and 400-level courses to update classes, bring them in conformity with Chemistry curricula at other OUS institutions, strengthen student exposure to chemistry, increase student elective options, and facilitate pathways toward degree completion. These changes were approved and adopted in the new 2008-2009 WOU catalog.

- This year the Geology faculty members (Myers, Taylor, and Templeton) collaborated on changes to the Earth Science program curriculum. These proposed curriculum modifications include: (1) addition of four new courses and updates to course numbers, titles and/or descriptions for eight existing Earth Science courses; (2) changes to the Earth Science Major, including incorporation of the new courses into the degree plan, addition of three new Mathematics options, revision of the Computer Science requirement, and concomitant credit hour change; and (3) modifications to the Earth Resources, Earth System Science, and Geology Minors to reflect the above course changes. These modifications represent a fine-tuning of Earth Science curriculum, the goal of which is to strengthen and modernize the major to best serve student needs. These changes are in review at the Faculty Senate level for consideration as old business at the first Fall 2008 meeting.

- Based on an extensive self-study in 2007, the Mathematics Department has devised an extensive program overhaul. The change includes switching upper level mathematics

courses from 3-credits to 4, revising class schedules (rotation of courses), updating degree requirements, modifying degree plans, implementing a new degree option (Applied Mathematics), and adding new courses (Mathematical Modeling and Capstone Experience for Mathematics Education Majors). This program overhaul was approved by the Curriculum Committee and the Faculty Senate. The changes are implemented in WOU 2008-2009 course catalog.

**4C. Program Assessment**

- The Biology Program has actively engaged assessment for past several years across their curriculum. They continue to extensively utilize BI100 pre- and post-tests and the ETS Field Exam to gauge student success and program needs. The ten-year ETS exit exam average falls between the 85th and 90th percentiles. In spring 2008, the biology department chose to assess progress towards their second stated learning outcome "Engage in laboratory experimentation, data analysis and interpretation, and critical thinking at all course levels". Every faculty member in the department used a standard attitudinal assessment tool to gauge which courses in our program address this learning outcome, it can also be used to evaluate student perceptions of what is meant by experimentation and analysis. The data will be analyzed this summer and discussed by the department in September, 2008.

- The Chemistry Program accomplishes formative assessment using a number of traditional methods including quizzes and exams taking the form of essays, multiple choice, true/false, and problem solving; group oral presentations and writing assignments. Writing work samples are also employed to gage student comprehension. The style and level of formative assessment varies with instructor and course content. Summative assessment is accomplished via capstone experiences in CH461/462 and CH407 (Seminar). Assessment techniques include scientific presentations and independent research on current topics in chemistry. In addition to the above, chemistry students are required to complete the ETS field test as part of their senior experience.

- Earth and Physical Science faculty have been rapidly developing program assessment techniques over the past several years. This is a work in progress and requires a significant time commitment for design and implementation. During spring term 2008, Jeff Templeton developed and implemented two embedded assessment strategies for his Volcanology course (ES 454) that are specifically aligned with the three learning outcomes for the Earth Science Major. Steve Taylor developed and implemented three embedded assessment strategies for his Environmental Geology course (ES 473) also aligned with learning outcomes. Taylor also continued to develop an online exit-exam for the Earth Science program and use in ES407 Senior Seminar. The online system will use the WebCT environment to provide testing of graduating seniors in Earth Science. Bill Schoenfeld has been actively utilizing pre- and post- concept inventory tests in his physics 200-level courses. Pre-class inventory results appear to be good predictors of student success.

- The Math Department has actively engaged a number of formative and summative assessment strategies as an outgrowth of their 2007 self study. Program assessment activities include utilization of the ETS major field test for graduating math majors, 5-

year alumni surveys, a capstone Senior Project (MTH403), and annual exit interviews. The capstone course includes writing a research paper based on published literature and formal presentations to the campus community. Use of the ETS field test is in the nascent stages and variable exam results thus far suggest that there are numerous logistical considerations that need to be worked out before meaningful analyses can be conducted.

### 4D. Achievements and Awards

- Mike LeMaster (Biology) was honored by NACADA with a "Faculty Advisor" Award (one of seven individuals selected nationally) during the 2007-2008 academic year. He currently advises approximately 100 pre-nursing students with whom he meets once a term to develop appropriate schedules so that they may apply to nursing schools in a timely manner. Mike has developed a pre-nursing webpage, worked up general information sheets to send to perspective students, and compiled pre-requisite information for all the nursing programs in Oregon to assist with the scheduling of students already in our pre-nursing program. This is in addition to advising approximately 5 – 10 biology majors with an emphasis in Zoology, as well as several biology minors.

## 5. FACULTY RESEARCH AND SCHOLARSHIP

### 5A. Faculty Projects

- Scott Beaver (Math) finished work on the Banach Algebra paper and submitted it for publication at the end of June. He is also collaborating with Cheryl Beaver to complete data collection and analysis on an IRB-approved peer-assessment study. He also is working on two journal papers related to developing MTH253 into a logic vehicle and Löwdin Orthogonalization.

- Cheryl Beaver (Math) continued work on an IRB-approved study with colleague Cheryl McAllister of Southeastern Missouri State University regarding Fraction Study, in collaboration with Scott. Along with Laurie Burton, Klay Kruczek, and Maria Fung, she has submitted a prospectus to edit a book for the Mathematical Association of America (MAA) comprised of a collection of articles on Middle School education programs.

- Hamid Behmard (Math) submitted a paper to the IEEE Transactions on Signal Processing entitled "Efficient Reconstruction Algorithms Using Shifted Lattices".

- Sara Boomer (Biology) continued her ongoing NSF/MO/RUI-supported Yellowstone RLMO project, with extensions (e.g. Yellowstone Research Coordination Network (RCN) core group member/leader activities). This project facilitated 2 WOU undergraduate research projects and ongoing work with post-doctoral fellow Niki Parenteau (now at NASA-Ames in Mountain View, CA). This work includes three projects in various stages: (1) a 4-year monitoring project that is attempting to find relationships between environmental changes and population genetic variation, (2) a 4-year biofilm formation study, and (3) diversity studies at some novel iron springs. In October 2007, Sarah also began newly-funded (Department of Energy) work to sequence

genomes from 2 of the Yellowstone sites. This consortium grant (see below) was awarded to 20 representative site leaders in Yellowstone, although it only provides direct funds to sequence DNA at the Joint Genome Institute in Walnut Creek, CA.

- Laurie Burton is working on a book entitled "Visual Algebra for College Students", in collaboration with the Math Learning Center (Salem, Oregon). The Mathematics Association of America invited Burton along with C. Beaver, Fung and Kruczek to submit a proposal to compile and edit a collection of articles and resources, "Programs, Courses and Resources for Training Preservice Middle School Mathematics Teachers" as a volume in the MAA Notes Series. Their proposal has been accepted and they have just begun their work (inviting and collecting abstracts) as editors of this MAA Notes book.

- Bryan Dutton (Biology) continued research on an invasive plant species project in the Luckiamute Watershed (with Steve Taylor). Dutton also continues long-term work on an online, interactive flora project in Polk County, Oregon. He was an invited expert on revising the Jepson Manual (i.e., the California Flora) treatment of *Anemone* (Ranunculaceae) for the Jepson Flora project. In addition to his own research, Dutton continued to collaborate with Sarah Boomer on her long-term studies of diversity and phylogeny of hot-spring bacteria and started a new project with Adele Schepige (COE) and other WOU faculty entitled "Preparation for Instruction of Science & Math" (PRISM). This is a funded program designed to build the capacity of Oregon's K-8 teachers in math & science instruction.

- Karen Haberman (Biology) continued ongoing immunochemical analysis of formalin preserved krill. She has also been studying macroinvertebrate diversity along the Little Luckiamute River to determine whether water quality and ecosystem integrity vary spatially and temporally.

- Klay Kruczek and a colleague studied Tic-Tac-Toe played on Zd with n rational slopes, instead of the typical horizontal, vertical, and diagonal slopes. They submitted a paper on this work, which has been partially accepted. Klay is also in the process of finishing the course pack for prospective K – 8 teachers in the field of discrete mathematics. He plans to publish the course book via the Math Learning Center in Salem. Finally, he is also researching an effective way to measure popularity in professional baseball via attendance statistics, popularity polls, merchandise sales, and television viewership.

- Mike LeMaster (Biology) continued a long-term study of the role of estrogen in pheromone production, in collaboration with Dr. Robert Mason at Oregon State University. Mike also continues work on a project entitled "Time after Emergence – Why a Decrease in Female Attractiveness?" which includes behavioral experiments to demonstrate that female red-sided garter snakes become less attractive in the two weeks following emergence from winter hibernation. Emily Uhrig, an undergraduate at WOU, has been involved with both of these projects. Mike also supervised two additional student projects examining the variation in pheromone production among species. This work primarily was performed by Zach Christopherson, chemistry major, and Chelsey Miller, biology major, both of whom are in the WOU Honors Program.

- Jeff Myers (Earth Science) continued work with H.E. Schorn and D.M. Erwin (UC Berkeley) on an examination of Neogene paleofloras of the Far West US. This project involves updating the systematics, chronology, and geological information of published paleofloras of Neogene (the past 24 million years) age. Myers also continues long-term research on the paleobotanical record of the Eocene – Oligocene transition in the interior Pacific Northwest. In addition to paleobotany, Jeff is also involved with photo-documentation of the earthquake retrofit of the WOU Humanities and Social Sciences Building and development of a campus earthquake preparedness program.

- Pete Poston (Chemistry) recently initiated two research projects as a result of a summer internship with the National Park Service, Maze District. One involves using Raman Spectroscopy to characterize rock art pigments within the park in a remote, on-site, non-destructive manner. The other project is related to recent archaeological evidence that a comet strike put an end to Clovis habitation in N. America. An ashy layer is present within the park that has been sampled and sent to the Keck Collaboratory at OSU for the analysis of Iridium, an element very common in extraterrestrial objects.

- Bill Schoenfeld (Physics) is lead scientist for the Global Climate Change Institute for Teachers (GIFT) in collaboration with Adele Schepige (COE), Phil Wade (Earth Science), V. Anderson (COE), S. Dauer (COE), and Avery Cotton (COE Grad. Student). The GIFT team has logged hundreds of hours working on many aspects of a NASA Grant to provide quality educational materials and activities on climate change for use by elementary school teachers. Schoenfeld made weekly trips to a fifth grade classroom to test various hands-on activities. As a group, they are presently working on a thorough review of children's literacy on the subject. Teacher workshops are being held this summer (2008) and include the assistance of two WOU undergraduates (Shawn Decker and Laura Waight).

- Steve Taylor (Earth Science) continued collaborative research with Dr. Fred Swanson at the HJ Andrews Experimental Forest, Pacific Northwest Research Station (U.S. Forest Service). Working title of this research project is "The Influence of Geomorphic and Anthropogenic Processes on Decadal-Scale Sediment Yield in the Western Cascades, Oregon". This work forms part of a sabbatical-related Research Opportunity Award (ROA) funded by the National Science Foundation. Taylor also continued collaboration with Bryan Dutton (Biology) on research related to invasive plant distribution in the Luckiamute Watershed. In addition, he continues to collaborate with Jeff Templeton (Earth Science) on geomorphic analysis of cinder cones at Newberry Volcano.

- Jeff Templeton (Earth Science) continued to work on two research initiatives at Newberry Volcano near Bend, Oregon. The objective of the first project is to constrain the petrogenetic evolution of the Newberry magma system using the Pleistocene ash-flow tuff deposits. This work is in collaboration with Julie Donelly-Nolan of the U.S. Geological Survey. The second research project focuses on the numerous cinder cones that punctuate the Newberry landscape. This work entailed the development of a digital geologic map and spatial database for the volcano (in collaboration with Steve Taylor). In addition to Newberry, Templeton is in the process of engaging a student research assistant to work on a mafic dike system exposed in northwestern Arizona and continues developing a manuscript entitled "Petrologic Constraints on the Evolution of a

Continental Silicic Magma Chamber: Mickey Pass Tuff, West-Central Nevada" (with Anita Grunder, Oregon State University).

- Mike Ward (Math) is working on a project entitled "On some minimality conditions involving elements of prime order in a group", in collaboration with L. C. Kappe, G. Mendoza, and M. Mazur at Binghamton University.

**5B. Peer-Reviewed Publications**

**Beaver, C.**, In Press, Cryptology in the Classroom: Using Zero-Knowledge Proofs to Analyze Cryptographic Protocols: Cryptologia.

Bennett, **Burton,** and Nelson, In Press, "Mathematics for Elementary Teachers: A Conceptual Approach" and "Mathematics for Elementary Teachers: An Activity Approach": McGraw Hill, anticipated publication date January 2009.

**Burton, L.,** 2007, College Geometry Test Items File, Second Edition: Prentice Hall.

**Fung, M.,** Damcke, D., Dray, T., Hart, D., and Riverstone, L., 2008, Dare to Compare: The Oregon Mathematics Teacher, May/June.

**LeMaster, M.P**., Stephani, A., Shine, R., and R.T. Mason. 2007. Cross-dressing in Chemical Cues: Exploring 'She-maleness' in Newly-emerged Male Garter Snakes. Chemical Signals in Hurst, J.L., Beynon, R.J., Roberts, S.C., and Wyatt, T.D., eds., Vertebrates 11: Springer, New York, New York, 223-230.

**Kruczek, K.**, 2008, Math and Maps: The Oregon Mathematics Teacher (TOMT), January/February edition.

**Kruczek, K.**, and Sundberg, E., In Review, A Pairing Strategy for Tic-Tac-Toe on the Integer Lattice with Numerous Slopes: Electronic Journal of Combinatorics.

Schorn, H.E., **Myers, J.A**., Erwin, D.M. 2007. Navigating the Neogene: Updating the paleobotanical record of the later Cenozoic in the Far West. Jarzen, D. and Retallack, G.J. editors, Festschrift Volume in honor of the 70th birthdays of Jack A. Wolfe and David R. Dilcher, Senckenberg Museum Publication, Frankfurt, Germany. V. 258: pp. 139-146.

**Taylor, S.B.,** 2007, Watershed Assessment, River Restoration, and the Geoscience Profession in Oregon: Oregon Geology, v. 68, p. 26-30.

**Ward, M.,** and Edwards, B.S., 2008, The Role of Mathematical Definitions in Mathematics and Mathematics Education, *in* M. Carlson and C. Rassmussen, Eds., Connecting Research in Undergraduate Mathematics Education to Practice: Mathematical Association of America.

Ziman, S.N., F. Ehrendorfer, C.S. Keener, W.T. Wang, S.L. Mosyakin, E.V. Bulakh, O.N. Tsarenko, **B.E. Dutton**, R.P. Chaudhary, and Y. Kadota. 2007. Revision of

Anemone Sect. Himalayicae (Ranunculaceae) with Three New Series. Edinburgh Journal of Botany 64(1): 51-99.

**5C. Presentations and Refereed Abstracts**

**Beaver, C.,** 2008, Zero-knowledge Proofs: How to convince someone you know everything without telling them anything: National Joint MAA, AMS Annual Mathematics Meeting, January, San Diego.

**Beaver, C**., 2008, Common error patterns in pre-service teachers' attempts at writing fraction word problems: Pacific Northwest Section Meeting of the Mathematical Association of America, Helena, MT (June).

**Beaver, C., and Kruczek, K.,** 2008, Panel Discussion: What is happening in High School and Pre-Calculus and Below: Pacific Northwest Section Meeting of the Mathematical Association of America, Helena, MT (June).

**Beaver, S.,** 2007, Assessing Student Presentations of New Material in Advanced Calculus: Mathematical Association of America (MAA) National Meeting.

**Beaver, S.,** 2007, Probability and Statistics for Elementary Teachers at Western Oregon University: Mathematical Association of America (MAA) National Meeting.

**Beaver, S.,** 2007, Seeing the Forest Through the Trees: How to Stop Students from Memorizing Proofs in Advanced Calculus: Mathematical Association of America (MAA) National Meeting.

**Beaver, S.,** 2008, Invertible Integral Operators and Subexponential Kernel Decay: Pacific Northwest Section Meeting of the Mathematical Association of America, Helena, MT (June).

**Behmard, H.**, 2008, An Efficient Reconstruction Method for Band-Limited Images Using Nonperiodic Sampling Sets: Society for Industrial and Applied Mathematics (SIAM) conference on Imaging Science, San Diego (July).

**Boomer, S.M.**, G. Geesey, **B.E. Dutton**, and K.L. Noll, 2008, Photosynthetic Mat Formation Studies in situ, 2nd Annual Yellowstone RCN Workshop, Bozeman, MT.

**Burton, L.,** 2008, Visual College Algebra for Middle School Teachers: National Joint MAA, AMS Annual Mathematics Meeting, January, San Diego.

**Burton, L., Fung, M., and Kruczek, K.**, 2008, MAA Session on Curriculum Materials for Preservice Middle School Mathematics Teachers: Sponsored by COMET, AMS/MAA Joint Winter Meetings, San Diego, CA, January, 2008 (17 papers were presented)

**Ellingson, D**., 2008, Global Warming: WOU Campus Panel Discussion, "Focus the Nation".

**Fung, M.,** and Dray, T., 2008, Exploring Concepts of Euclidean Geometry through Comparison with Spherical and Taxicab Geometries: National Joint MAA, AMS Annual Mathematics Meeting, January, San Diego.

**Kruczek, K.,** 2008, A Pairing Strategy for Tic-Tac-Toe on the Integer Lattice with Numerous Slopes: Annual Meeting of the Pacific Northwest Section of MAA, Helena, MT (June)

**Kruczek, K.,** 2008, What is the most popular team: National Joint MAA, AMS Annual Mathematics Meeting, January, San Diego.

**Kruczek, K.,** 2008, Panel Discussion: What is happening in High School and Pre-Calculus and Below: Annual Meeting of the Pacific Northwest Section of MAA, Helena, MT (June)

**Myers, J.A.,** 2007, The Neogene Comes Alive: Portland Gem and Mineral Show, Keynote Address, September 28.

**Myers, J.A.,** 2008, 20th Anniversary Celebration of the Stonerose Interpretive Center, Republic WA. April 19, 2008. The Okanogan Floras: A story of Temperate Plant Speciation and Intergradation.

**Myers, J.A.,** A.R. Pratt, L. M. Fitzgerald, 2008, What's Shaking at WOU? Students Develop Earthquake Awareness on Campus: Oregon Academy of Science Annual Meeting, Portland Community College, Sylvania.

Noll, K.L. and **Boomer, S.M.,** 2008, Geochemistry and Ecology of Red Mat Systems (GERMS) - A Long-Term Monitoring Project at Red Layer Microbial Observatory Sites in Yellowstone National Park, WOU Academic Showcase

Noll, K.L., N.E. Hanson, **B.E. Dutton**, M.N. Parenteau, and **S.M. Boomer**, 2008, Geochemistry and Ecology of Red Mat Systems (GERMS) - A Long-Term Monitoring Project at Red Layer Microbial Observatory Sites in Yellowstone National Park, ASM General Meeting, Boston, MA

Noll, K.L., **S.B. Taylor**, **B.E. Dutton**, and R. Pirot, 2007, Spatial Distribution of Invasive Plant Species in the Luckiamute Watershed, Central Oregon Coast Range: Vegetative Response to Geomorphic Processes and Disturbance Regime in the Riparian Corridor: Geological Society of America Fall 2007 Meeting, Denver, Colorado.

Parenteau**,** M.N., **S.M. Boomer**, K.H. Knoll, S.L. Cady, and B.K. Pierson, 2008. Diversity of Chloroflexus-like Organisms in an Iron-Depositing Hot Spring in Yellowstone National Park, 2nd Annual Yellowstone RCN Workshop, Bozeman, MT.

Parenteau, M.N., **S.M. Boomer**, K.L. Noll, **B.E. Dutton**, S.L. Cady, L.L. Jahnke, and B.K. Pierson. 2008. Diversity of Chloroflexus-Like Organisms in an Iron-Depositing Hot Spring in Yellowstone National Park, ASM General Meeting, Boston, MA

**Taylor, S.B.**, 2008, Watershed Assessment, River Restoration, and the Geoscience Profession in Oregon in panel session entitled "River Restoration –The Three "R's": Rules, Regulations, and Registration": 2008 River Restoration Northwest Conference, Skamania, Washington.

**Taylor, S.B.**, **B.E. Dutton**, K. Noll, R. Pirot, 2007, Riparian Plant Distribution in the Luckiamute River Basin, Central Oregon Coast Range: Preliminary Analysis of Geomorphic and Anthropogenic Controls on Adventive Species Propagation in an Unregulated Watershed: Geological Society of America Fall 2007 Meeting, Denver, Colorado.

**Ward, M.,** 2008, What Is Studied In, Written For, and Remembered From Western Oregon University's Bridge Course: National Joint MAA, AMS Annual Mathematics Meeting, January, San Diego.

**5D. Grants**

- Sarah Boomer (Biology) contributed to the grant-writing and is one of 19 site leaders for the "Yellowstone metagenome project" recently funded by the Department of Energy ($1,000,000).

- Laurie Burton, Cheryl Beaver, and Klay Kruczek (Math) received a $23,000 grant from the Mathematics Association of America to fund a 2008 summer institute entitled "Active Learning Approaches and Visual Methods for Teaching the Foundational Mathematics for Elementary Teachers"

- Bryan Dutton (Biology) submitted a proposal entitled "Distribution of Invasive Plant Species in the Luckiamute Watershed, Polk and Benton Counties, Oregon: Analysis of Controlling Variables and Migration Pathways", funded by the WOU Faculty Development Grant ($2900).

- Maria Fung (Math) received a WOU Foundation travel grant for Kristal Temple who went to the Nebraska Undergraduate Conference for Women. Kristal will be giving a presentation about her work there at Mathfest in Madison, Summer 2008.

- Mike Lemaster (Biology) submitted a proposal entitled "Pheromonal Regulation of Reproduction in Garter Snakes: What Makes a Male a Male?", funded by the WOU Faculty Development Grant ($2700)

- Jeff Myers (Earth Science) received funding from the WOU Foundation for student wages to assist in organizing the 2009 Oregon Academy of Science meeting at Western ($500)

## 6. FACULTY SERVICE

### 6A. Division Leadership

Lonnie Guralnick (Biology) ended his second 3-year term as NSM Division chair. Steve Taylor (Earth Science) was appointed new division chair for a 3-year term starting June 15, 2008. Department chairs in the division include: Hamid Behmard, Mathematics (co-chair for 2007-2008; chair for 2008-2009); Arlene Courtney, Chemistry; Maria Fung, Mathematics (co-chair for 2007-2008); Karen Haberman, Biology (outgoing chair); Mike Lemaster, Biology (chair elect); and Jeff Templeton, Earth and Physical Science.

### 6B. WOU Institutional Service

- Cheryl Beaver (Math) served as the NSM Division Representative on Academic Requirements Committee

- Scott Beaver (Math) served as WOU Faculty Senate Secretary and he is elected to be a member of the Faculty Senate Executive Committee At-Large for AY 2008-09. He was also WOUFT Local 2278 Secretary and is elected to be the Treasurer for AY 2008-09.

- Laurie Burton (Math) served as the departmental liaison organizing the remodeling and move of the Mathematics Department to the new Mathematics and Nursing Building. She has done an incredible job of making sure every detail is taken care of as planned.

- Arlene Courtney (Chemistry) served on the faculty development committee.

- Bryan Dutton (Biology) chaired the Provost Search Committee and was also a member of the Faculty Senate Executive Committee, Phi Kappa Phi president, and planning committee on PURE.

- Irja Galvan (Biology) chaired the Honors Committee, served on the Dewey –Smith Search Committee, the Who's Who Search Committee, and chaired the Faculty Honors Committee

- Karen Haberman (Biology) chaired the Study Abroad review subcommittee of the International Education and Service Committee.

- Rahim Kazerouni (Chemistry) served on the chemist search committee (along with Arlene Courtney and Pete Poston) and was responsible for coordinating CH200 PLTL program. He also served on the Student Grievance Committee.

- Michael LeMaster (Biology) chaired the Faculty Development Committee and co-advised the Natural Science Club with Bryan Dutton. Mike also coordinated the design and remodeling of NS005 (Cadaver Room) and NS006 (Physiology Laboratory) in the Natural Science Building.

- Jeff Myers (Earth Science) served as chair of the Faculty Senate Curriculum Committee, and was a member of the ad hoc Learning Communities committee and Freshman Experience committee.

- Pete Poston (Chemistry) was chair of the NSM Personnel Concerns Committee and sat on the WOU Campus Parking Review Committee.

- Bill Schoenfeld (Physics) served as NSM Division representative to the WOU/AFT Union bargaining team.

- Steve Taylor (Earth Science) continued lead role in guiding the WOU Academic Infrastructure Committee for the 2007-2008 year. The primary products of the year's activity included continued smart-room planning, development of a preliminary academic infrastructure plan, initiation of a pilot program to provide freely accessible wireless internet service to faculty and students on campus, and successful lobbying for inclusion of faculty advisors on the Student Technology Fee Committee.

- Jeff Templeton (Earth Science) served as the Chair of the 2008 Academic Excellence Showcase Planning Committee. Over 350 students presented their scholarly work at this highly successful event. Templeton also served as the Coordinator of the WOU Program for Undergraduate Research Experiences (PURE) and actively participated as a member of the Faculty Senate Ad Hoc Committee on LACC/General Education Review.

**6C. Professional Service and Community Outreach**

- Sarah Boomer (Biology) served on a formal review panel for the National Science Foundation's Microbial Observatory program.

- Laurie Burton (Math) is a member of the "Committee on the Mathematical Education of Teachers" of the Mathematical Association of America. She has also been a member of the faculty panel evaluating Curriculum Materials for Group Theory courses at Portland State University.

- Bryan Dutton (Biology) currently serves as Assistant Editor of The Vasculum, The Society of Herbarium Curators' official Newsletter.

- Maria Fung (Math) Member of the Editorial Panel of Mathematics Teacher, 3-year term appointment by the NCTM (April 2008-November 2010)

- Irja Galvan (Biology) and Michael LeMaster conducted cadaver tours for high schools and other groups.

- Klay Kruczek (Math) is the President-Elect of Oregon Mathematics Education Council (OMEC). He is also serving as Communications Officer for the Pacific Northwest Section of Project NExT, as well as Co-Chair of Steering Committee for the Oregon Invitational Mathematics Tournament.

- Michael LeMaster (Biology) served as the lead NSM faculty representative guiding development of the OHSU-Monmouth Campus nursing program. He diligently attended events associated with the nursing program, including meeting one senator (Senator Smith) and several state / national congresspersons. Lonnie Guralnick (Biology) also played a major role in the establishment of the nursing program.

- Jeff Myers (Earth Science) was selected to serve a second term as President of the Oregon Academy of Science for 2008-2009. He was also formally appointed a Research Associate of the UW Burke Museum of Natural and Cultural History, in addition to serving as an advisor to the Condon Museum, John Day Fossil Beds National Monument.

- Bill Schoenfeld (Physics) served as Associate Director of the NASA/Oregon Space Grant Consortium (OSGC) and as Affiliate Representative for Western Oregon University to OSGC. Through his work, he has cultivated NASA funding and professional contacts in support of several WOU student scholarships and internships. He also co-coordinated (with M. Pettinger, Political Science, and K. Brown, Earth Science) WOU "Focus the Nation" events concerning global warming in Jan. 2008. Finally Schoenfeld was actively engaged in K-12 community outreach and served as a campus advocate for advancement of science education programs.

- Steve Taylor (Earth Science) was involved with a wide array of professional service duties in the State of Oregon and beyond. Outreach activities included: (1) serving as Earth Science Advisor for K-12 Science Standards Review Panel, Oregon Department of Education, Salem; (2) university liaison to the Oregon Geographic Information Council, Salem; (3) continued duties as chair and board member of the Oregon State Board of Geologist Examiners (OSBGE); (4) continued serving as member of the council of examiners, Association of State Boards of Geology, Columbia, South Carolina; (5) university liaison to the State Geologic Map Advisory Committee, Oregon Dept. of Geology and Mineral Industries, Portland; (6) university liaison for the Luckiamute Watershed Council, Monmouth; (7) team co-leader and geologic field guide for the Summer 2007 and 2008 White Water Institute, Maupin, Oregon; (8) participating scientist and faculty facilitator in the Summer 2007 and 2008 Ecosystem Informatics Institute at Oregon State University and HJ Andrews Experimental Forest.

- Jeff Templeton (Earth Science) served as a Professional Mentor at two K-12 schools in the mid-Willamette Valley. He assisted students at Leslie Middle School in Salem on their Science Fair projects, and worked with students at Jefferson Elementary School in Corvallis on a field-based research project. Templeton also continued serving as the WOU Campus Representative for the Geological Society of America.

**6D. Professional Societies**

- Cheryl Beaver (Math): National Council of Teachers of Mathematics, Oregon Council of Teachers of Mathematics, Mathematical Association of America, Teachers of Teachers of Mathematics.

- Scott Beaver (Math): American Mathematical Society, Mathematical Association of America, Society for Industrial and Applied Mathematics, National Council of Teachers of Mathematics, Oregon Council of Teachers of Mathematics.

- Hamid Behmard (Math): Institute of Electrical and Electronics Engineers, Society for Industrial and Applied Mathematics.

- Sarah Boomer (Biology): Yellowstone Association, American Society for Microbiology, MicrobeLibrary, Phi Kappa Phi.

- Karen Brown (Earth Science): Member National Association of Geoscience Teachers.

- Laurie Burton (Math): Mathematical Association of America, National Council of Teachers of Mathematics, Oregon Council of Teachers of Mathematics, Teachers of Teachers of Mathematics.

- Bryan Dutton (Biology): American Society of Plant Taxonomists, Council on Undergraduate Research, International Association of Plant Taxonomists, National Science Teachers Association, Natural Science Collections Alliance, Northwest Scientific Association, Society of Sigma Xi, Society of Systematic Biologists, The Honor Society of Phi Kappa Phi, The Society of Herbarium Curators, The Willi Hennig Society.

- Irja Galvan (Biology): National Association of Biology Teachers; International Society of Developmental and Comparative Immunology.

- Karen Haberman (Biology): American Society of Limnology and Oceanography, Association for Biology Laboratory Education (ABLE), Long-term Ecological Research (LTER) Network, Xerces Society (conservation of invertebrates).

- Rahim Kazerouni (Chemistry): American Chemical Society; Oregon Academy of Science.

- Klay Kruczek (Math): American Mathematics Society (AMS), Mathematical Association of America (MAA), Oregon Council of Teachers of Mathematics (OCTM), Oregon Mathematics Education Council (OMEC), National Council of Teachers of Mathematics (NCTM), Teachers of Teachers of Mathematics (TOTOM).

- Mike LeMaster (Biology): Human Anatomy and Physiology Society.

- Jeff Myers (Earth Science): Great Basin Institute (on board of directors), Oregon Academy of Science (President), Geological Society of America, Paleontological Society, International Organisation of Palaeobotany

- Pete Poston (Chemistry): American Chemical Society; Society for Applied Spectroscopy.

- Steve Taylor (Earth Science): American Geophysical Union, Friends of the Pleistocene, Geological Society of America.

- Jeff Templeton (Earth Science): Geological Society of America (GSA); American Geophysical Union (AGU); National Association of Geoscience Teachers (NAGT).

- Phil Wade (Earth Science): National Association of Science Teachers.

- Mike Ward (Math): Mathematical Association of America.

## 7. STUDENT SCHOLARSHIP AND PLACEMENT

### 7A. Honors and Scholarships

- Matt Buche (senior, Earth Science major) and Ryan Stanley (junior, Earth Science major) were honored as the Outstanding Undergraduate Students in Earth Science.

- Avery Cotton received a NASA/Oregon Space Grant Consortium Graduate Fellowship to study in the WOU MAT program, and work on the Global Climate Change Institute for Teachers grant.

- Shawn Decker and Laura Waight (Physics Minors) each received $3000 Oregon Space Grant undergraduate scholarships this year.

- Ian Macnab (senior, Earth Science major) was awarded an Urban and Regional Information Systems Association research scholarship for a project entitled: "Geomorphic and anthropogenic influences on invasive plant distribution in the Luckiamute watershed: Using GIS as a tool for spatial analysis", under the guidance of Dr. Taylor. Ian was also honored as the Outstanding Graduating Student in Earth Science.

### 7B. Undergraduate Research and Internships

- Sarah Boomer (Biology) led her final NSF-funded research trip to Yellowstone. The grant supported the participation of six undergraduates. All students performed field research while in the park and completed formal lab notebooks and related computer analysis and assignments. Dr. Boomer also advised two undergraduate research students, Nana Hansen (who completed her work in Summer 2007) and Katie Noll, whose work resulted in a first author presentation at the national ASM meeting.

- Matt Buche (senior, Earth Science major) gained summer paid employment with Kane Geotechnical, Stockton, CA. Matt is working as a field technician in the areas of landslide analysis and mitigation.

- Lonnie Guralnick (Biology) advised student Amanda Cline in undergraduate research in Plant Physiology as part of his off-campus Research Opportunity Award at University of Nevada-Reno.

- Karen Haberman (Biology) advised student Ashley King for a one-term independent research project on stream Ecology.

- Heather Hintz (senior, Earth Science major) – gained summer employment as an interpretive ranger at Honeyman State Park, Oregon Dunes National Recreation Area, Florence, OR.

- Michael Lemaster (Biology) advised two honors students (Zach Christopherson / Chelsey Miller) and one undergraduate (Emily Uhrig) in undergraduate research projects – all of which included much field work (E.E. Wilson – Oregon; Manitoba, Canada)

- Katie Noll (B.S. Earth Science, 2008): Presented a paper at the Fall 2007 National Meeting of the Geological Society of America entitled: "Spatial Distribution of Invasive Plant Species in the Luckiamute Watershed, Central Oregon Coast Range: Vegetative Response to Geomorphic Processes and Disturbance Regime in the Riparian Corridor". Katie also worked the past academic year as a research technician in Dr. Sara Boomer's microbiology lab at Western Oregon University. The focus of the research is on understanding the hydrogeologic setting of thermophyllic bacteria at Yellowstone National Park.

- Alyssa Pratt and Ryan Stanley (Earth Science majors) are working with Jeff Myers on the FEMA earthquake awareness project and assisting with the 2009 annual meeting of the Oregon Academy of Science.

- Kristal Temple (B.S. Math, 2008) presented a synopsis of her senior thesis at the joint meeting of American Mathematical Society and Mathematical Association of America MATHFest 08 in Madison Wisconsin.

- 16 Students from the Spring 2008 ES 473/573 Environmental Geology class prepared abstracts and presentations for the 2008 WOU Academic Showcase. The session was entitled "Earth Science in Context: Land Use and Watershed Function in the Willamette Basin".

- 18 Students from the Spring 2008 ES 454/554 Volcanolgy class prepared abstracts and poster presentations for the Academic Excellence Showcase at WOU. The session was entitled "Volcanoes of the World".

- Math Student Achievements: One of our sophomores has presented her research in the Nebraska Conference for Undergraduate Women in Mathematics February 2008. Three of our sophomores have been accepted into the Pre-REU on Signal and Image Analysis at the Texas A&M University this summer. Another sophomore has been accepted in the Carleton College Summer Mathematics Program for Women this summer.

**7C. Careers and Placement**

Motivated graduates from **NSM Division** programs continue to successfully secure jobs in private and public sectors, enter into graduate school, or advance to health-related professional programs.

A significant number or recent **Biology** graduates have been accepted into medically-related graduate, Physician's Assistant, Dental, and Pharmacy programs. These include:

Traditional or Osteopathic Medicine

| | |
|---|---|
| Nicole Mullins | (Midwestern University-- Glendale campus (MWU) and Arizona college of Osteopathic Medicine.) |
| Lincoln Ropp | (Kansas City University of Medicine and Biosciences and Nova Southeastern University College of Osteopathic Medicine in Florida) |
| Adam Young | (West Virginia School of Osteopathic Medicine) |

Physician's Assistant Programs

| | |
|---|---|
| Lorie Austin | (Idaho State University) |
| Adam Reichold | (Pacific University.) |
| Michelle Swanick | (Idaho State University) |

Dental School

| | |
|---|---|
| Catherine Dahl | (Tuft's University) |
| Tyler Mack | (OHSU) |
| Alex Vo | (OHSU) |

Pharmacy School

| | |
|---|---|
| Nathan Howell | Oregon State University |

In addition to graduate and professional programs in health science, the **Biology** program placed 19 students into accredited nursing programs via the pre-nursing track. These include:

Nursing School

| | | |
|---|---|---|
| Nerea Hoffman | BSN | NW Nazarene University |
| Shawna Backman | AND | Shoreline C. C. (Wash.) |
| Ellen Ylimiemi | BSN | Marymount University |
| Katie Branam | BSN | University of Portland |
| Julia Thomas | BSN | University of Portland |
| Katrina Griffiths | BSN | University of Portland |
| Daniel Lima | BSN | University of Portland* |
| Nancy Ibarra | BSN | University of Portland |
| Veronica Nunez | BSN (acc.) | Linfield University |
| Kendra Fresh | BSN | Linfield University |
| Harriet Blake | BSN | Nor. Arizona University |
| Morgan Huffstutter | BSN (acc.) | Linfield University |

| | | |
|---|---|---|
| Rachel Bonham | AND | Oregon Coast C.C. |
| Karen Fredrickson | BS (nursing) | OHSU – Monmouth |
| Andrea Cobb | ADN | Walla Walla C.C. |
| Stephanie Sherman | BSN | Concordia University |
| Sarah Skotte | BS (nursing) | OHSU – Monmouth |
| Jennifer Pond | BS (nursing) | OHSU – Monmouth |
| Stephanie Banford | BSN | Linfield University |

Other **Biology** graduates have secured other positions outside of heathcare, these include:

| | |
|---|---|
| Amanda Cline | Accepting into Biology Ph.D. program Univ. of Nevada, Reno |
| Chelsea Miller | Clinical Worker, Child Family Health International, Equador |
| Emily Uhrig | Howard Hughes Medical Institute Summer Research Grant (OSU) |

Top **Chemistry** graduates continue to find gainful employment in forensics, commercial laboratories, and/or entrance into graduate programs.

Graduates from the **Earth and Physical Science** program over the past several years are also systematically advancing to successful careers as graduate students, science educators, or professional geoscientists. Notable alumni who have recently contacted faculty with news include:

Jeff Budnick (B.S. Earth Science, 2005) – obtained employment as a hydrologist for River Measurement, Inc., Vancouver, WA.

Chandra Drury (B.S. Earth Science, 2005) – obtained employment as a hydrologist and environmental specialist for the Flood Control District of Maricopa County, AZ.

Holly Grimes (B.S. Nat Sci – Chem/Phys option) is currently a graduate student at PSU and is working this summer at the Jet Propulsion Lab (JPL) in Pasadena with funding from the Oregon Space Grant program.

Jeff Kent (B.S. Earth Science, 2005) – continued working as a mining geologist for Resolution Copper Mining in Superior, AZ.

Katie Noll (B.S. Earth Science, 2008) – gained employment as a science instructor for Quality Schools International, Chengdu, China. Katie will be teaching physical science to middle-high students in an international setting.

Rachel Pirot (B.S. Earth Science, 2007) – continued working on an M.S. degree in engineering geology at Portland State University. Her thesis topic involves the study of debris flow mechanisms on Mt. Hood. She received several prestigious student research awards in 2007-2008 to support of her thesis research.

Amy Poff (B.A. Earth Science, 2002) – completed volunteer work for the Peace Corps in western Africa, returned to the U.S. and obtained employment as a Intepretive Ranger at Lava Beds National Monument in northern California.

Mark Speiring (B.S. Earth Science, 2006) – completed Officers Training School with the U.S. Army in Fort Benning, GA.

Dane Wagner (B.S. Earth Science, 2007) – obtained employment as a geotechnician and field geologist with Kane Geotech, Inc., Stockton, CA.

In the past year, the **Mathematics Department** had ten graduates. Of these, five applied to graduate school and three have already been accepted, ne continues her career in the Army, and the rest have either been employed or are seeking employment.

## 8. STRENGTHS AND CHALLENGES

### 8A. Strengths

- **NSM Division** programs focus on quality teaching, close student-faculty interaction via individualized mentoring, small upper-division class sizes, inquiry-based laboratory and field experiences, and promotion of undergraduate research.

- The highly subscribed 100-level lab science courses for non-majors significantly contribute to the **Liberal Arts mission** at WOU and provide students with opportunities for relevant, real-world problem solving. These courses also provide the foundation for pre-nursing and pre-education students.

- **NSM faculty** continuously strive to improve their respective curricula, embrace a technology-enriched learning environment, and implement meaningful program assessment tools.

- **NSM faculty** actively serve as leaders on campus committees and regularly participate in a variety of professional service positions, both at the state and national levels.

- **NSM faculty** members are actively engaged in a spectrum of peer-reviewed research, publications, and related professional development.

- The **Biology program** is notably robust with a strong number of majors and graduates, a consistent record of student placement, continued enrollment growth in the pre-nursing track and BI200 sequence, and nationally recognized faculty.

- The **Chemistry program** provides rigorous training for professional scientists, affords students the opportunity to gain direct hands-on experience using specialized techniques, has developed a strong collaboration with the Oregon State Police forensics program, and is experiencing parallel enrollment growth in health science-related service courses.

- The **Earth Science program** is one of the campus leaders with respect to service contributions to the Liberal Arts Core Curriculum and pre-education programs. The ES100 sequence serves approximately 1300 students per year, is a common first destination for entering freshman, and has a notably high retention rate between fall, winter, and spring terms.

- The **Physics program** is actively engaged in K-12 community outreach and improving science teacher training in the State of Oregon. Linkages with the NASA-based Oregon Space Grant helps to provide scholarships and financial support for some of the brightest students in the division.

- The **Mathematics Department** is nationally recognized as one of the top 10 programs in the area of teacher education. A recent study by the National Council on Teacher Quality (Greenberg and Walsh, 2008) determined that the WOU math education program is highly robust and making significant contributions in the area of teacher preparation. This recognition combined with strong enrollment numbers in the math education courses attest to the success and dedicated work of the math faculty (Greenberg, J., and Walsh, K., 2008, No Common Denominator - The Preparation of Elementary Teachers in Mathematics by America's Education Schools: National Council on Teacher Quality, Washington, DC, http://www.nctq.org).

**8B. Challenges and Actions**

- **Faculty Lines.** NSM is currently in need of additional tenure lines and replacement positions. Excellent faculty additions were made last year with two new biologists (one replacement and one new position), and one new chemist (new line). These incoming faculty will help ease the growth-related burdens associated with the pre-nursing program and other existing needs. At the same time, we have had two tenured faculty leave for opportunities elsewhere (Fung/Math; Gurlalnick/Biology), and the 56% adjunct:tenure faculty ratio in Earth and Physical Science is anomalously high compared to other programs in the division (and on campus for that matter) (refer to Section 1 above). The tenure-line replacement for Guralnick is already approved and underway, however the need for the Fung replacement and new ES100 physical science educator line are equally as important. The high levels of student-credit-hour production (Section 2) and salary offsets related to these three requested tenure-lines significantly justify their viability.

- **Work Space.** Teaching, laboratory, and office space in the Natural Sciences building is reaching full capacity. With increasing enrollments, we are approaching a point where we cannot add lab sections and need to carefully limit faculty:student ratios in lecture classes. Through creative remodeling and office shuffling, we were able to accommodate the three new tenure-line hires in Biology and Chemistry for the 2008-2009 academic year. However NSB space is rapidly filling and the "easy" solutions have been implemented. We have potential opportunity to convert a few underutilized building areas into several small faculty office-lab spaces and accommodate limited future growth, but this will require extensive group discussion, consensus building, and creative problem solving with the Physical Plant. Along these lines, the new Math-Nursing building is a great addition and a well-deserved upgrade for the Mathematics Department, but office space is already filling and continued need for additional lower-level remedial math instructors will result in a projected space crunch within the next year or two.

- **Equipment Budget.** While an influx of one-time "opportunity funds" in the 2007-2008 academic year helped advance the academic infrastructure in the science and math programs (Thank You!), we still lack an explicit line-item in the budget for major equipment purchases (>$10,000). Science is a discipline that is directly tied to

technology with high depreciation costs and continuous need for maintenance and upgrades. Our graduates are expected to be proficient in the use of technology, scientific instrumentation, and computer hardware/software as they enter the 21st century marketplace. While advances have been made over the past 10 years, existing departmental budgets are insufficient for the purchase of modern instrumentation and are stretched to maintain aging equipment. We are still in need of new major pieces of equipment such as an NMR (nuclear magnetic resonance) device, gas chromatograph-mass spectroscope, microscopes, high resolution GPS station, and a plant growth chamber. Additional infrastructure needs include extensive renovation of NS017, the ES100 laboratory that services ~1300 students per year (refer to Section 2). Possible solutions include development of an additional general fund line-item in the division budget, or securing grants and donations from external organizations. The latter will require additional investment of faculty release time, administrative services, and foundation support.

- **Faculty Workload.** NSM Division faculty are increasingly burdened with demands involving recruitment-retention, program reporting, and other service-related tasks above and beyond our "normal" full-time teaching schedules, curriculum development, assessment activities, research expectations, and advising. As the university grows and advances, the faculty workload additions are outpacing the support services and staffing needed to accommodate the changes. Oversaturated workload conditions run of the risk of "faculty burnout", low workplace morale, and degraded quality of the academic programs.

- **Enrollment Imbalances.** The successful advertising and growth in the pre-health professional programs (e.g. OHSU/pre-nursing, medicine, dental, etc.) is causing dichotomous relationships between over-enrollment in foundations classes (e.g. BI200, Anatomy and Physiology, CH100) and under-enrollment in upper division courses geared for other types of career pathways (e.g. Plant Ecology). An ancillary effect is that the Biology program can only offer a limited number of upper division electives for the traditional Biology major, due in part to increasing FTE devoted to 100/200-level courses and Anatomy & Physiology sequences. The net effect is that upper division students encounter scheduling conflicts, risk missing a required course, and/or potentially delay graduation. Careful advising and additional staffing in critical program areas are possible solutions, but the problem is being exacerbated as growth of the pre-nursing program continues.

- **Student Preparation.** A significant challenge for NSM programs is that of poorly-prepared incoming freshman, relatively low levels of science and math proficiency, and deficient study skills. Low scores on math placement tests are an endemic problem that disrupt scheduling sequences and create an immediate barrier for students who are interested in math and science disciplines. The net result is reduced retention and diversion of otherwise interested math/science students to other disciplines or universities. A significant portion of the problem lies within the K-12 education system and is beyond our immediate control. NSM faculty are aware of these problems with no easy answers. Continued work with the Office of Admissions and Student Enrichment Program are the current avenues being utilized to address this issue. More discussion, problem solving, and work is needed.

- **Student Retention.** Related to the above item, a notable challenge is student retention and attrition in select NSM course sequences, particularly at the introductory level. The BI200 series loses approximately 45% of the students as it progresses from fall, winter, to spring. Although variable in level, similar retention/attrition patterns are also observed in BI100, CH100, CH200, ES200, and PH200 sequences. A portion of these patterns are attributable to the low science and math proficiencies of incoming freshman as stated above. These trends are also likely related in part to social factors, youth culture, and WOU student demographics. Recent actions that have been implemented to address the retention issue include the PLTL peer-instructional program, addition of recitation hours, and increased linkages to student support services (e.g. Admissions Office, Student Enrichment Program, Tutoring Center, etc.). This is likely going to be a persistent problem and ongoing faculty discussion, problem solving, and curricular assessment will be needed.

- **Recruitment.** Recruitment of Earth Science majors remains an ongoing topic. While levels of Earth Science majors and graduates are holding steady, the program has not experienced the modest growth that was anticipated when it was restructured in 2001. The most significant challenge to growth results from the general lack of exposure to Earth Science or Geology in the high school curriculum. Geology-related course offerings at the high school level occur sporadically on a district-by-district (teacher to teacher) basis, and are not prominently required in the same way as chemistry, biology, or physics. The result is that students receive minimal exposure to geology in high school, with little understanding of career options or the importance of Earth Science to natural resources issues. This deficiency is notable given the prominent role that the geosciences are currently playing in the state and national dialogue about oil and gas resources, energy production, water supplies, sustainability, and global climate change. An additional impediment relates to the student demographics at WOU, with over 60% of the graduates comprised of females. While great advances have been made with respect to women in geoscience, the Earth and Physical Sciences are still drastically underrepresented by female graduates. To address these issues, Earth Science faculty recently implemented a number of outreach strategies in the past year. It will be two or three years before their effectiveness can be fully evaluated.

## 9. STAFFING CHANGES AND PERSONNEL NEEDS

The Biology and Chemistry departments completed three successful tenure-line searches in AY2007-2008. One of the positions was replacement for Bob Turner (Biology), the other two represent new lines as part of the OHSU nursing start-up package.

- Kristin Latham is our new Developmental/Genetics/Cell Biologist. Her presence in the Biology Department will allow them to maintain their breadth in core courses as well as upper-division specialties. In addition, her scholarly pursuits are quite amenable to further advancing the undergraduate research program at WOU.

- Erin Baumgartner is our new Biology Education Specialist. Her key role will be to guide the BI100 non-majors sequence so that it is grounded in sound pedagogy and assessment practices. Erin will be receiving release time specifically to evaluate the results of

several years of pre- and post-test data and guide appropriate changes to the non-majors sequence.

- Patty Flatt will be teaching Biochemistry, CH100, and Forensics as part of the Chemistry Department. She is very interested in developing a small program where undergraduate chemistry/biology majors would be able to get some hands-on training in different aspects of molecular genetics and biochemistry. Her primary interests are in microbial diversity and natural products biochemistry. She will continue research collaborations at Oregon State University that will offer summer opportunities for WOU undergraduates.

Other staffing changes include:

- Maria Fung (Math) and Lonnie Guralnick (Biology) both left WOU for other employment opportunities at the end of the 2007-2008 academic year. Adjuncts have been hired to replace the positions for AY2008-2009. Permanent tenure-line replacement requests are in process, the Guralnick position is approved and advertising underway. The Fung request is submitted, pending administrative approval and budgetary deliberations.

- A search for a new Biology-Earth/Physical Science lab preparator is currently underway. We anticipate filling the position and having the hire on board by the time fall term classes start.

- The Earth Science program added two new adjuncts during the 2007-2008 year. Jeremiah Oxford and Grant Smith were hired to cover courses in the ES100 sequence.

- An adjunct instructor in Physics is on board to start work at 0.5 FTE in fall term 2008. KC Walsh (PhD Student at OSU) will be assisting in the PH200 sequence. This position will provide some camaraderie and release time for Bill Schoenfeld so that he can pursue external funding and K-12 outreach activities.

- Math has hired two new adjuncts for the 2008-2009 academic year to assist in teaching remedial math to incoming freshman.

- Sarah Boomer (Biology) will still be on sabbatical in Fall 2008. Her FTE will be covered by shifting of major's Microbiology to Winter and Spring 2009, hiring of an adjunct to fill in for non-majors load, and postponement of the new Microbial Ecology course until Spring 2011.

- Karen Haberman (Biology) will be on sabbatical for the 2008-2009 academic year. Her FTE will be accommodated by hiring adjuncts to cover General Ecology, Animal Behavior, and BI212 Labs; shifting Dutton's load to teach BI212 lectures; cancellation of Marine Ecology and Entomology; and addition of a Vertebrate Natural History lab to replace the loss of the field-based courses.

- Mike LeMaster (Biology) will take over as Department Chair and will be receiving 0.25 release for the 2008-2008 year. His load will be covered by shifting some BI212 labs and Anatomy and Physiology to adjunct faculty.

- Due to increased enrollments and move of the Mathematics Department to a new location (MNB) Sharyne Ryal's (office specialist) duties have increased dramatically. Her position is being promoted from an OS1 to an OS2 level. This proposal was approved by the Dean of LAS and Human Resources.

Earth and Physical Sciences is currently in need of at least two tenure-track faculty positions. The departmental course load is supported with an anomalously high number of adjunct instructors. The department respectfully requests that the administration evaluate current faculty needs and rectify the notable tenure-line deficiency in the Earth and Physical Sciences. We need at least two tenure-track positions, as described below.

- **Assistant Professor of Earth and Physical Science Education.** The Earth and Physical Science Department requests that WOU hire a broadly trained Science Education Specialist for a full-time tenure-track Assistant Professor position beginning Fall 2009. The successful candidate will teach courses enrolled primarily by K-12 Education majors, including Earth and Physical Science Methods and introductory Earth System Science. Additional instructional duties depending on specialty will include Meteorology, Oceanography, Astronomy, and one or more upper-division Science Education courses in area of expertise. This position will provide a critical link between the Colleges of LAS and Education, and the successful candidate will be encouraged to pursue external funding opportunities to improve Science Education curriculum at the undergraduate level and for pre-service K-12 Educators.

- **Assistant Professor of Physics.** Faculty member will instruct introductory courses in Physics (General and Calculus based physics with labs), Meteorology, Astronomy, and possibly some science education or introductory Earth Science courses. Justification: About eight years ago a Physics position was being held for a candidate to finish her Ph.D., but the individual decided not to return to WOU. The position was one of twenty-four cancelled by the Administration that year. We currently have one physicist who teaches both the general and calculus-based Introductory Physics courses with labs plus upper-division courses for the minor. This is a challenging task and puts a significant strain on the one physicist. Physics is an important area which supports the Biology, Chemistry, and Earth Science programs. The addition of a second physicist would allow more upper-division courses to be offered and promote growth in the number of physics minors, especially among math majors. An additional faculty member would also stimulate instructional dynamics that are just not possible with a single specialist.

## 10. RECOMMENDED PUBLIC RELATIONS HIGHLIGHTS

The following is a collection of NSM Division highlights recommended by faculty for promotion by WOU Public Relations and the College of Liberal Arts and Sciences:

- **Biology Department – OHSU Nursing Monmouth Campus:** this is an ongoing news item with infinite possibilities for PR/promotion as the program progresses over the next year.

- **Karen Bledsoe (Biology) – Teacher Preparation Project Grant:** Karen is part of a group that recently received $500,000 through the Oregon Dept. of Education, Math-Science Partnership Program. The goal of the project is to improved science teacher training.

- **Sarah Boomer (Biology) – Genome Research Grant:** In October 2007, Sarah began collaborating on a newly-funded (Department of Energy) project to sequence genomes from 2 of her research sites in Yellowstone. This $1,000,000 consortium grant was awarded to 20 representative site leaders in Yellowstone, although it only provides direct funds to sequence DNA we provide on-site at the Joint Genome Institute in Walnut Creek, CA.

- **Bryan Dutton (Biology) and Steve Taylor (Earth Science) – Invasive Plant Research and Oregon150 Celebration:** Our collaborative research on invasive species in the mid-Willamette Valley work probably represents a significant PR piece. This project will form part of a library display and symposium for the commemoration of the 150th anniversary of Oregon's statehood to be presented during winter term, 2009.

- **Klay Kruczek (Math) - President-Elect of the Oregon Mathematics Education Council:** OMEC is an organization focused on intersegmental study and deliberation, recommendations to improve the learning environment in mathematics in Oregon schools at all levels, and to improve the pre-service and in-service training of teachers. The group includes representatives from four-year and two-year institutions (public and private), industry, public and private schools (K-12), and the Oregon Department of Education.

- **Mike LeMaster (Biology) – National Advisor Recognition:** Mike was recently honored by NACADA with a "Faculty Advisor" Award (one of seven individuals selected nationally) during the 2007-2008 academic year.

- **Jeff Myers (Earth Science) – WOU Earthquake Preparedness:** Jeff suggests that we make a big deal out of the campus earthquake awareness project. One of the FEMA mandates is that we involve the local community via press releases and WOU Journal articles. Yumei Wang from DOGAMI strongly supports this effort. Imagine the headline: "WOU students work with community and emergency officials to develop earthquake preparedness on and off campus". Sounds like a winner to Jeff.

- **Jeff Myers (Earth Science) - Oregon Academy of Science:** WOU will once again be hosting the Feb. 2009 Oregon Academy of science meeting. Jeff's group will actively work with Public Relations to disseminate information about this meeting (mark your calendars).

- **Karen Haberman (Biology) – Krill Research:** Karen is currently collaborating with Dr. So Kawaguchi of the Australian Antarctic Division (AAD) to study the feeding ecology of the Antarctic krill, Euphausia superba. She recruited Western Oregon University alumna Kelly Hatteberg (B.S. 2006, Biology), now at the AAD laboratory in Tasmania, to serve as her research assistant and "chef to the krill." Kelly's mission is to grow different types of phytoplankton and feed it to the krill.

- The **Mathematics Department** is nationally recognized as one of the top 10 programs in the area of teacher education. A recent study by the National Council on Teacher Quality (Greenberg and Walsh, 2008) determined that the WOU math education program is highly robust and making significant contributions in the area of teacher preparation. This recognition combined with strong enrollment numbers in the math education courses attest to the success and dedicated work of the math faculty (Greenberg, J., and Walsh, K., 2008, No Common Denominator - The Preparation of Elementary Teachers in Mathematics by America's Education Schools: National Council on Teacher Quality, Washington, DC, http://www.nctq.org).

- **Mathematics Department – MAA PREP Workshop/Grant:** This project is being organized by Cheryl Beaver, Laurie Burton and Klay Kruczek and is entitled "Active Learning Approaches and Visual Methods for Teaching the Foundational Mathematics for Elementary Teachers Courses." The workshop proposal received $23,000 in funding from the Mathematical Association of America.

- **Mathematics Department – Student Acheivement and Outreach Acitivies:** Four WOU math students were accepted into national PRE-REU and REU programs (REU: Research Experience for Undergraduates). These include three students attending a month-long Pre-REU in Signal and Image Processing at Texas A&M this summer: Molly Mack, Dania Morales, and Emily Trigg. The accomplishments of each of these students should be touted ideally in Western Oregon University Magazine, and at least on the WOU website. Math faculty are also promoting "Sonia Kovalesky Day", a math outreach event for high school girls.

- **Natural Sciences and Mathematics – New Faculty Showcase:** We have three new tenure-track faculty starting Fall 2008. We need to give them a warm welcome and showcase their expertise and interests via WOU promotion and PR.

- **Bill Schoenfeld (Physics) - Global Climate Change Institute for Teachers:** Ongoing work with other WOU faculty, NASA, teacher workshops, and K-12 outreach initiatives has potential as a PR promotional piece.

- **Jeff Templeton (Earth Science) – Newberry Volcano Research:** The volcanology and petrology research initiatives at Newberry Volcano has potential from a public relations and promotional standpoint. Everybody loves a hot volcano story!