WESTERN OREGON UNIVERSITY

Geology & Earth Science

Student Advising and Career Guide

Prepared By

Earth Science Program
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www.wou.edu/earthscience

EARTH SCIENCE PROGRAM DESCRIPTION

The Earth Science (ES) program at Western Oregon University (WOU) is part of the Earth and Physical Sciences Department in the Division of Natural Sciences and Mathematics (NSM). The program offers BS/BA degrees in Earth Science, with minors in geology, Earth system science, Earth resources, and Earth history/paleobiology. Earth Science is supported by three tenure/tenure-track faculty members and four fixed-term, adjunct faculty. Focus areas include Earth system science education, volcanology-igneous petrology, stratigraphy-sedimentology-paleobiology, and geomorphology-environmental geology. Supporting curricula includes meteorology, oceanography, geochemistry, and physics/astronomy.

WOU is distinctive in that it offers the only multidisciplinary Earth Science degree in the Oregon University System. A key strength of the program is the close alliance with faculty in chemistry, physics, biology, and education. NSM is organized in such a way that budgets, labs, and classroom resources are shared across a range of science disciplines. Faculty from different disciplines work closely together on a daily basis and cultivate a multidisciplinary, collegial atmosphere that is truly unique compared to other institutions. The cross-disciplinary alliance in NSM provides a superb opportunity for faculty and students with diverse interests to interact in a rich and stimulating academic environment. Earth Science plays an important role by providing a nexus for studies in the biological and physical sciences. Additional programmatic strengths include: (1) small faculty:student ratios with personalized instruction and a focus on undergraduate training; (2) a curriculum in which Earth Science courses and labs are taught by PhD-trained faculty; (3) degrees leading to student career tracks in science education, natural resource management, and environmental restoration; and (4) a faculty dedicated to scholarly activity that is relevant to training undergraduate students for careers in the 21st century marketplace. The Earth Science program at WOU directly supports the advancement of geoscience education, conservation planning, environmental management, and natural hazards mitigation in the State of Oregon.

MISSION STATEMENT

The Earth Science program provides a liberal arts core education in geoscience with an emphasis on the scientific method, problem solving, and interdisciplinary science education. A key objective of the program is to prepare undergraduates for careers as professional geoscientists and educators. The program also promotes the development of an informed citizenry for wise decision-making on issues related to natural resources, environmental quality, and sustainability in Oregon and beyond.

STUDENT LEARNING OBJECTIVES

(1) Acquire a comprehensive understanding of the interrelated physical, chemical, and biological processes operating in the Earth system. Utilize this understanding to enter graduate school or obtain employment as a professional geoscientist.
(2) Develop proficiency using technology-enriched analytical techniques to solve geologic problems.
(3) Experience inquiry-based science in the context of outdoor adventure.
(4) Cultivate an integrated scientific community of students and faculty at WOU.
(5) Work hard, play hard, and have fun!

WOU Earth Science Program
Expanded List of Student Learning Outcomes

Students completing a degree in Earth Science will achieve the following outcomes:

1. Understanding of the various Earth system components as achieved through inquiry-based, interdisciplinary curricula in the physical and biological sciences.
2. Understanding of the complex interaction among Earth system components.
3. Understanding of the historical variation in Earth system components and their interactions, with a focus on how they might recur in the future.
4. Recognition that fundamental knowledge of our Earth system is critical for sustainable, long-term habitation of the planet by humans.
5. Understanding of natural hazards processes, their social impacts, and mitigation procedures.
6. Understanding of anthropogenic impacts to the Earth system and their social consequences, particularly with respect to water resources, mineral / energy resources, climate, and the biosphere.
7. Understanding of the origin, occurrence, and significance of basic Earth resources, including, but not limited to, water, soils, minerals, rock aggregates, metals, and fossil fuels.
8. Ability to interpret and reconstruct ancient landscapes over time and distance.
9. Application of quantitative megascopic and microscopic data from minerals, rocks, and fossils to resolve questions of economic and scientific interest.
10. Proficiency in techniques of applying the scientific method, knowledge acquisition, and transfer of information.
11. Proficiency in the use of observing systems, geospatial technology, computers, information processing, and data analysis.
12. Proficiency in the areas of graphical presentation, mapping, oral communication, and scientific writing.

Earth Science Faculty at Western Oregon University

Tenured Faculty

Dr. Jeff Myers	Professor of Geology (stratigraphy-sedimentology-paleontology-Earth system science; PhD 1998, University of California - Santa Barbara)
Dr. Steve Taylor	Professor of Geology (geomorphology-environmental geology-geographic information systems-Earth system science; PhD 1999, West Virginia University)
Dr. Jeff Templeton	Associate Professor of Geology (volcanology-petrology-geochemistry-Earth system science; PhD 1998, Oregon State University)

Adjunct Faculty

Karen Brown	Adjunct Instructor (Earth system science; M.S. Geology, 1987, New Mexico Tech.)
Don Ellingson	Adjunct Instructor (Earth system science/meteorology; M.S. Science Education, 1985, Western Oregon University).
Jeremiah Oxford	Adjunct Instructor (Earth system science; M.S. Geology, 2005, Oregon State University)
Grant Smith	Adjunct Instructor (Earth system science; M.S. Agronomy and Soils, 2005, Washington State Univeersity; PhD Pending, Science Education, Oregon State University)
Phil Wade	Adjunct Instructor (Earth system science / science education; M.S. Geology, 1991, San Diego State University)

Earth Science Major 73-78

ES 201, 202, 203 Principles of Geology..... 12

Choose one of the following sequences..... 12

- BI 101, 102, 103 General Biology
- BI 211, 212, 213 Principles of Biology
- PH 201, 202, 203 General Physics
- PH 211, 212, 213 General Physics with Calculus

Choose one of the following Math options.....8-10

- A. MTH 112 Elementary Functions (4)
  MTH 243 Introduction to Probability and Statistics (4)
- B. MTH 243 Introduction to Probability and Statistics (4)
  MTH 251 Calculus I (5)
- C. MTH 251 Calculus I (5)
  MTH 252 Calculus II (5)

ES 301 Petrographic Microscopy 2

ES 302 Quantitative Methods..... 2

ES 321 Structural Geology 4

ES 322 Geomorphology and Aerial Photo Interpretation..... 4

ES 392 Sedimentary Geology..... 4

ES 407 Senior Seminar..... 1

ES 450 Introduction to Petrology 4

ES 453 Geology of the Pacific Northwest..... 4

ES 473 Environmental Geology 4

Choose one course in the area of Earth System Science..... 3

- ES 331 Introduction to Oceanography
- ES 390 Basic Meteorology
- GS 351 Elements of Astronomy

Choose one course in the area of Sedimentology/Paleobiology 3-4

- ES 304 Survey of the Fossil Record
- ES 431 Paleobiology
- ES 491 Stratigraphy and Depositional Systems

Choose one course in the area of Volcanology/Petrology 3-4

- ES 354 Volcanoes and Earthquakes
- ES 454 Volcanology
- ES 460 Energy and Mineral Resources

Choose one course in the area of Environmental Geology/Surface Processes 3-4

- ES 341 Fundamentals of Geographic Information Systems
- ES 476 Hydrology
- ES 492 GIS Applications in Earth Science

CH 104, 221, 222 are to be completed as the LACC Laboratory Science requirement. The B.S and B.A. require completion of 2 to 4 credit hours of Computer Science coursework depending on the chosen Math option. For this major, 4 hours of Writing Intensive course work should come from WR 322 (Technical Writing).

Idealized Four-Year Earth Science Course Sequence

BA/BS Degree Plan
Major: Earth Science
Minor:

Freshman Year

Fall		
Course #	**Title**	**Units**
ES 201	Principles of Geology	4
MTH 111	College Algebra	4
CH 104	Introductory Chemistry	4
WR 135	College Writing II (or other LACC)	3 to 4
	Total	15 to 16

Winter		
Course #	**Title**	**Units**
ES 202	Principles of Geology	4
MTH 112	Elementary Functions	4
CH 221	General Chemistry	5
	LACC course (e.g. SP 111)	3 to 4
	Total	16 to 17

Spring		
Course #	**Title**	**Units**
ES 203	Principles of Geology	4
MTH 243	Intro. Probability and Statistics	4
CH 222	General Chemistry	5
	LACC course	3 to 4
	Total	16 to 17

Sophomore Year

Fall		
Course #	**Title**	**Units**
	PH or BIO sequence I	4
MTH 251	Calculus I	5
ES 301	Petrographic Microscopy	2
	LACC or WR 322 or ES 331	3 to 4
	Total	14 to 15

Winter		
Course #	**Title**	**Units**
	PH or BIO sequence II	4
ES 450	Intro to Petrology	4
	LACC or WR 322 or ES 390	6 to 8
	Total	14 to 16

Spring		
Course #	**Title**	**Units**
	PH or BIO sequence III	4
	CS121 or CS122 or CS195	2 to 3
ES 302	Quantitative Methods	2
	LACC or WR 322 or GS 351	6 to 8
	Total	14 to 17

Junior Year

Fall		
Course #	**Title**	**Units**
ES 321	Structural Geology	4
ES 322	Geomorphology	4
	LACC and/or Minor Courses	6 to 8
	Total	14 to 16

Winter		
Course #	**Title**	**Units**
ES 453	Geology of Pacific Northwest	4
	ES341 or ES476	3
	LACC and/or Minor Courses	8
	Total	15

Spring		
Course #	**Title**	**Units**
	ES 354 or ES454	3 to 4
ES 473	Environmental Geology	4
	LACC and/or Minor Courses	8
	Total	15 to 16

Senior Year

Fall		
Course #	**Title**	**Units**
ES406	Independent Study	1 to 2
	ES 431 or ES 491	3 to 4
	LACC and/or Minor Courses	12
		3 to 4
	Total	16 to 17

Winter		
Course #	**Title**	**Units**
ES406	Independent Study	1 to 2
	LACC and/or Minor Courses	12
	Total	13 to 14

Spring		
Course #	**Title**	**Units**
ES 407	Senior Seminar	1
ES 392	Sedimentary Geology	4
	LACC and/or Minor Courses	12
	Total	16

Standard LACC Components

Creative Arts	**9**
Health & Physical Education	**4**
Laboratory Science	**12**
Literature/Modern Language	**8**
Philosophy or Religion	**3**
Social Science	**11-12**
Speech	**3**
Writing	**4**
Total	**55**

BA Degree Requirements

Math & CS:	**7**
Writing Intensive:	**6**
Foreign Language:	**4-24**

BS Degree Requirements

Math & CS:	**12**
Writing Intensive:	**6**
Diversity:	**6**

WOU Earth Science Career Tracks and Recommended Course Preparation

I. Career Tracks for B.S./B.A. Earth Science Degrees

a. Graduate School/Advanced Professional Studies in Earth Science-Geology
b. Physical Science Education (Grade 8-12 Teacher Preparation)
c. Geotechnical/Environmental Workforce
d. Environmental Law
e. Liberal Arts/General Studies

II. Recommended Course Preparation Arranged by Career Track

a. Graduate School / Advanced Professional (B.S. Earth Science, leading to M.S. / Ph.D.)

i. Required geology core
ii. LACC Lab Science: CH221, 222, 223
iii. Science Elective: *PH 211,212,213 or PH201,202,203 (option based on level of high school math/science proficiency; *calculus-based physics preferred)
iv. Math Elective: calculus
v. Earth Science Electives: Choose 1 elective from each of 3 focus areas: Surface Processes/Environmental, Petrology/Volcanology, Sedimentology/Paleobiology (selections based on personal interests)
vi. Recommended List of Supporting Minors: Biology, Chemistry, Environmental Studies, Geography, or Math
vii. Special Note: students intending to go to graduate school should select a specialty interest area from one of the three focus areas during their senior year. Please contact the relevant faculty member for more information on their specialty and what will be expected of you in graduate school. Completion of the Graduate Record Exam will be required prior to graduate school application, typically completed in the fall term of senior year. An independent research project is recommended during senior year, contact relevant faculty for ideas and options.

b. Physical Science Education (B.S. Earth Science, leading to M.A.T. in Education)

i. Required geology core
ii. LACC Lab Science: CH104,221,222 or CH221,222,223 (option based on level of high school chemistry proficiency)
iii. Science Elective: PH201,202,203 or PH211,212,213 (option based on level of high school math/science proficiency)
iv. Math Elective: computer science or calculus (selection based on personal preference)
v. Earth Science Electives: Choose 1 elective from each of 3 focus areas: Surface Processes, Petrology/Volcanology, Sedimentology/Paleobiology (selections based on personal interests)
vi. Recommended List of Supporting Minors: Biology, Chemistry, Environmental Studies, Geography, or Math
vii. Special Note: The Master of Arts in Teaching (M.A.T.) degree will provide graduates with a fifth-year education program leading to an initial teaching license at the master's level. Please contact the College of Education for more information on requirements for the M.A.T. Completion of the Praxis Exam will be required prior to graduate school application.

c. Geotechnical/Environmental Workforce (B.S. Earth Science)

i. Required geology core
ii. LACC Lab Science: CH104,221,222 or CH221,222,223 (option based on level of high school chemistry proficiency)
iii. Science Elective:
    1. Environmental/Bioresource Focus: BI101,102,103 or BI211,212,213
    2. Environmental/Geotechnical/Water Resources Focus: PH201,202,203 or PH211,212,213
iv. Math Elective:
    1. Environmental/Bioresource Focus: computer science or calculus
    2. Environmental/Geotechnical/Water Resource Focus: calculus
v. Earth Science Electives: Choose 1 elective from each of 3 focus areas: Surface Processes, Petrology/Volcanology, Sedimentology/Paleobiology.
vi. Recommended List of Supporting Minors: Biology, Chemistry, Environmental Studies, Geography, or Math
vii. Special Note: a B.S. Earth Science will provide graduates with the necessary minimum qualifications for entry-level positions in the Geotechnical and Environmental industry. Advanced management-level positions commonly require 5+ years of experience and a master's degree. The State of Oregon requires a license to practice professional geology for the public. It is recommended that students apply for the initial "Geologist-In-Training" (GIT) license upon graduation through the Oregon State Board of Geologist Examiners in Salem. The initial licensing process involves successful completion of 45 quarter hours of geology courses and passing a nationally-standardized fundamental geology exam. The initial GIT license will allow work as an apprentice under the supervision of a "Registered Professional Geologist" (RPG) for a minimum of three years. After a total of five years professional experience beyond the B.S. degree, graduates will qualify for completion of the advanced practice exam and the RPG license. Up to three years of professional experience is awarded for full-time graduate studies in geology or related fields at the master's / Ph.D. level.

d. **Environmental Law (B.S. Earth Science leading to the Juris Doctor degree)**

i. Required geology core
ii. LACC Lab Science: CH104,221,222 or CH221,222,223 (option based on level of high school chemistry proficiency)
iii. Science Elective: BI101,102,103 or BI211,212,213
iv. Math Elective: computer science
v. Earth Science Electives: Choose 1 elective from each of 3 focus areas: Surface Processes, Petrology/Volcanology, Sedimentology/Paleobiology
vi. Required Minor: Legal Studies
vii. Special Note: It is suggested that pre-law students take the Legal Studies minor and additional coursework in the following areas: Accounting, Economics, History, Political Science, Philosophy, Psychology, Sociology, Speech and Writing. Admission to law school is highly competitive. Applicants are usually expected to achieve an undergraduate GPA of at least 3.0 and perform well on the Law School Admission Test (LSAT), although strength in one of these areas may compensate for weakness in the other. The LSAT should be taken early in the senior year. For more information about preparatory materials, contact the Pre-Law advisor in the Social Science Division.

e. **Liberal Arts / General Studies (B.A. Earth Science as a Liberal Arts degree)**
   a. Required geology core
   b. LACC Lab Science: CH104,105,106 (advisor approval required for substitution of CH104,221,222)
   c. Science Elective: BI101,102,103
   d. Math Elective: computer science
   e. Earth Science Electives: Choose 1 elective from each of 3 focus areas: Surface Processes, Petrology/Volcanology, Sedimentology/Paleobiology (selections based on personal interests)
   f. Recommended List of Supporting Minors: Health, Spanish, Environmental Studies
   g. Special Note: Not recommended for graduate school or advanced technical work in the natural resources industry.

WOU EARTH SCIENCE
WORKFORCE TRAINING

The Earth Science program provides a liberal arts core education in geoscience with an emphasis on the scientific method, problem solving, and interdisciplinary science education. A key objective of the program is to prepare undergraduates for careers as professional geoscientists and educators. The program also promotes the development of an informed citizenry for wise decision-making on issues related to natural resources, environmental quality, and sustainability in Oregon and beyond. WOU Earth Science is distinctive in that it is the only undergraduate-focused degree program of its kind at any of the comprehensive, regional institutions or private liberal arts colleges in the State of Oregon.

The WOU Earth Science Program supports the state higher education needs in three primary ways:

(1) Provides career training for natural resources, environmental, and geoscience professionals,
(2) Provides interdisciplinary physical science training for K-12 teachers, and
(3) Provides liberals arts education for Oregonians in the areas of natural hazards mitigation, natural resources management (water, minerals, energy, ecological services), geospatial technology and environmental sustainability.

For nearly two decades, there has been a persistent call to improve standards and learning outcomes in undergraduate Science, Technology, Engineering, and Mathematics (STEM) education in the United States. As the global economy shifts to one requiring workers to increasingly develop proficiencies in computer-based technology and problem-solving skills, the U.S. has consistently lagged behind other developed nations in STEM learning performance. Results from a recent survey of 302 employers by the American Association of Colleges and Universities suggest that two- and four-year colleges are not fully preparing students for success in the global marketplace (AACU, 2010). In fact, the majority of respondents suggested that general education programs require significant improvements for competitive job placement of college. Concomitantly, society is under constant pressure with increasing demands for improved natural resource management in the areas of energy development, water resource utilization, environmental planning, and hazards mitigation. A survey of some of the most noteworthy news events over the past several years demonstrates the strategic importance of the Earth Science discipline in the state and nation, examples include: global warming, unstable petroleum markets, water wars in the Klamath Basin, Hurricane Katrina, Haitian earthquake disaster, Indonesian tsunami catastrophe, Gulf oil spill, Chilean earthquake episode, landslide damage in Lake Oswego, coastal erosion and land development in Newport; the list goes on. Earth Science is the quintessential study of “social, economic, and environmental challenges” and stands squarely at the crossroads of interdisciplinary science, technology, global economics, and natural resource management.

In the State of Oregon, Earth Science degrees lead directly to student career tracks in science education, natural resource management, and environmental restoration. The WOU program directly supports the advancement of geoscience education, conservation planning, environmental management, and natural hazards mitigation. The problem-solving and technical skills acquired via training in the Earth Sciences are highly valuable and marketable, regardless of career track. Students are expected to actively participate in the learning process and make a significant contribution to the academic integrity of the Earth Science program at WOU. The ultimate goal of the program is to provide graduates with the academic skills that will enable them to be highly competitive in graduate school or the 21st century career marketplace. Through the professional geologist licensing process, and the Oregon State Board of Geologist Examiners, the WOU Earth Science degree has a clear outcome leading students directly to career pathways as one of over 1200 licensed geoscience professionals in the state.

WOU EARTH SCIENCE
STUDENT RESEARCH OPPORTUNITIES AND GRANTS

Over $1.09M in grant funds have been generated through the Earth Science program at Western Oregon University during the review period. The following is a bulleted summary of faculty-driven grant proposals and funding initiatives related therein (reverse chronological order; note: a significant percentage of these projects directly involve WOU undergraduate students as partners and research assistants):

- 2010, National Science Foundation; Transforming Undergraduate STEM Education (TUES) Grant: "Transforming Undergraduate Earth System Science Curricula through Inquiry-Based Learning-for-Use Modules" (Templeton PI, Taylor and Wade, Co-PI, $249,657, review pending)
- 2010, NASA Oregon Space Grant: "Comparative Hydrogeomorphic Analysis of Western Oregon Watersheds Using Airborne Laser Swath Altimetry (LIDAR)" (Taylor faculty supervisor for B. Snook, WOU Student, $5000, review pending)
- 2010, Meyer Memorial Trust and Oregon Watershed Enhancement Board (OWEB) Special Investments Partnership Program: "Hydrogeologic Assessment and Aquifer Characterization at the Luckiamute State Natural Area" (Taylor PI with WOU student assistants, $25,000, review pending)
- 2010, WOU Faculty Development Research Grant: "Description of an Articulated Fruiting Head of Securidaca (Polygalaceae) from the Latest Eocene Badger's Nose Flora of NE California" (Myers, PI, $2500)
- 2010, Contract Agreement Upper Nehalem Watershed Council: "GIS Analysis and Results from Rapid Bio-Assessment (RBA) and Limited Factors Analysis (LFA) in the Upper Nehalem Watershed, Tillamook County, Oregon" (Taylor PI with WOU student assistants, $17,000)
- 2010, Western Oregon University Faculty Development Fund: "Electron Microprobe Analysis of Pleistocene Ash-flow Tuffs at Newberry Volcano, Oregon: Fine-scale Compositional Constraints on the Evolution of a Continental Silicic Magma System" (Templeton PI, $2300)
- 2010, U.S. Environmental Protection Agency, Greater Research Opportunities (GRO) Fellowship for Undergraduate Environmental Study: "The Distribution and Occurrence of Nitrate in Groundwater Supplies of the Mid-Willamette Valley: Implications for Water Resource Management in the Monmouth-Independence Area, Oregon" (Taylor faculty supervisor for K. Dana, WOU Student, $45,100)
- 2010, NASA Oregon Space Grant: "Land Cover Analysis Utilizing Aerial Photography, Remote Sensing and Geographic Information Systems: Application to Riparian Zones in the Mid-Willamette Basin, Oregon" (Taylor faculty supervisor for R. Stanley, WOU Student, $5000)
- 2009, U.S. Department of Justice: "Application of Spatial Statistics to Latent Print Identifications: Towards Improved Forensic Science Methodologies" (Taylor Co-PI with E. Dutton and project team P. Aldrich, B. Dutton, $685,800)
- 2008, Cascades Volcano Association: "Geomorphic Analysis of Late Quaternary Cinder Cones at Newberry Volcano, Central Oregon: Landform Evolution and Eruptive History in a Back-Arc Setting" (Taylor PI, $500)
- 2007, Oregon Department of Geology and Mineral Industries Undergraduate Research Stipends: "Seismic Preparedness and Hazards Mitigation at Western Oregon University (Myers, PI, $1000).
- 2007, Western Oregon University Faculty Development Fund and Foundation: "Tertiary Paleobotany Studies in Western and Central Oregon" (Myers, PI, $2800)

- 2007, National Science Foundation-Research Opportunity Award: "The Influence of Geomorphic and Anthropogenic Processes on Decadal-Scale Sediment Yield in the Western Cascades, Oregon" (Taylor Co-PI with F. Swanson, $13,000)
- 2007, Western Oregon University Faculty Professional Development Grant: "The Influence of Forestry Practice on Geomorphic Processes in Oregon (Taylor PI, $2100)
- 2007, Western Oregon University Faculty Development Research Grant: "Detailed Geochemical Study of Pleistocene Ash-Flow Tuffs at Newberry Volcano, Oregon: Constraints on the Evolution of a Silicic Magma System" (Templeton PI, $2100)
- 2005-2006, Northwest Invasive Weed Management Partnership: "Reconnaissance Survey of Japanese Knotweed Distribution in the Luckiamute River Basin" (Taylor Co-PI with B. Dutton, $2000)
- 2005-2006, Oregon Community Foundation Grant: "Geomorphic and Anthropogenic Influences on the Distribution of Invasive Plant Species in the Luckiamute Watershed" (Taylor Co-PI with B. Dutton, Year 2 Supplemental, $5000)
- 2005, Western Oregon University Faculty Development Research Grant: "Petrologic Investigation of the Tepee Draw Tuff and Related Units at Newberry Volcano, Oregon: Constraints on Zoning and Configuration of the Pre-eruptive Magma Chamber" (Templeton PI, $3000)
- 2004-2006, Center for Water and Environmental Sustainability (OSU/U.S. Geological Survey): "Hydrogeomorphic Analysis of the Luckiamute Watershed, Central Coast Range, Oregon: Integrating Applied Watershed Science with Undergraduate Research and Community Outreach" (Taylor PI, $15,000)
- 2004-2005, Western Oregon University Foundation Grant: "Spatial Analysis of Cinder Cone Distribution at Newberry Volcano" (Taylor PI, Student Research Grant, $1000)
- 2004-2005, WOU Center for Teaching and Learning Research Grant: "Morphometric Analysis of Cinder Cones at Newberry Volcano" (Taylor Co-PI with J. Templeton, $800).
- 2004-2005, Western Oregon University Faculty Professional Development Grant: "Geomorphic and Anthropogenic Influences on the Distribution of Invasive Plant Species in the Luckiamute Watershed" (Taylor Co-PI with B. Dutton, $6000)
- 2004, Western Oregon University Faculty Development Fund and Foundation: "Tertiary Paleobotany Studies in Western and Central Oregon" (Myers, PI, $3000)
- 2003-2004, Oregon Community Foundation Grant: "Geomorphic and Anthropogenic Influences on the Distribution of Invasive Plant Species in the Luckiamute Watershed" (Taylor Co-PI with B. Dutton, $7000)
- 2003, Western Oregon University, PT3 (U.S. Dept. of Education) Student Technology Associate Program: "Development of an Earth System Science Digital Image Library" (Templeton PI with student assistant, $500)
- 2002-2005, National Science Foundation, Course, Curriculum, and Laboratory Improvement-Adaptation and Implementation (CCLI) Grant: "Actively Engaging Undergraduates in Geologic Problem Solving by Integrating Petrographic Microscopy and Digital Image Analysis into an Earth Systems Science Curriculum" (Templeton PI, $80,900)
- 2002-2003, Western Oregon University, PT3 (U.S. Dept. of Education) Faculty Grant: "Integrating Electronic Measurement Technologies into the General Science Laboratory Curriculum: Enhancing the Preparation of Pre-Education Majors at Western Oregon University" (Templeton and Taylor co-PIs, $5,000)
- 2002, DAAD German American Academic Exchange Service Fellowship: "Paleobotanical Research Exchange at the Senckenberg Museum, Germany" (Myers PI, $5000)
- 2002, Evolving Earth Foundation: "Systematics of Conifer Taxa in the Oligocene Willamette Flora, Western Oregon" (Myers faculty sponsor for student S. Burgett, $2100)

- 2002, Western University Faculty Development Grant: “Tertiary Paleobotany Studies in Western and Central Oregon” (Myers PI, $3000)
- 2002, Western Oregon University, Faculty Professional Development Grant: “Geomorphic Controls on Sediment Transport Efficiency in the Luckiamute Watershed, Polk and Benton Counties Oregon” (Taylor PI, $3000)
- 2002, Western Oregon University, PT3 (U.S. Dept. of Education) Faculty Grant: “A Practical and Uniform Microscope Technology Platform for K-12 Educators (Myers PI, $8000)
- 2002, Oregon Collaborative for Excellence in the Preparation of Teachers (NSF-funded initiative in state of Oregon): “Write ON! Retreat; Earth System Science – An Innovative Approach to Teaching Undergraduate General Science” (Templeton PI, $1000)
- 2002, Digital Library for Earth System Education (NSF-supported geoscience education project): “Invited Participant–Third Annual Meeting of DLESE at Cornell University, Ithaca, NY, June 29-July 2, 2002” (Templeton, $335)
- 2002, Western Oregon University Faculty Development Grant: “Digital Image Analysis of Macroscopic and Microscopic Textures in Ash-Flow Tuffs at Newberry Volcano, Oregon” (Templeton PI, $3000)
- 2001-2002, Western Oregon University, PT3 (U.S. Dept. of Education) Faculty Grant: “Integrating Digital-Based Pedagogy into the Earth and Physical Science Curriculum at Western Oregon University: Modeling Best Practices for Education Majors through Enhanced Classroom Technology” (Templeton, Taylor, and Myers co-PIs, $28,000)
- 2001-2006, Junior Science and Humanities Symposium Organizational Grant (Myers Co-PI with A. Schepige, and A. Courtney, $33,800)
- 2001, National Science Foundation / Oregon Collaborative for Excellence in the Preparation of Teachers (OCEPT): “Development of an Interdisciplinary Science Summer Institute for the Preparation of Elementary-Middle School Science Teachers (Co-PIs: J.A. Myers, S. Taylor, B. Dutton, P. Poston, $8000)
- 2001, Western Oregon University, PT3 (U.S. Dept. of Education) Faculty Grant: “Integrating Geospatial Technology into a Natural Science Summer Institute Course” (Co-PIs: J. Myers, S. Taylor, B. Dutton, and P. Poston, $4500)
- 2001, Western Oregon University, PT3 (U.S. Dept. of Education) Faculty Grant: “Development of a Virtual Integrated Science Field Trip Module (Myers Co-PI with A. Courtney, and A. Schepige, $5000)
- 2001, Western University Foundation Grant: “Tertiary Paleobotany Studies in Western and Central Oregon” (Myers faculty sponsor student J. Cameron, $1,000)
- 2001, Western Oregon University Faculty Development Major Project Grant: “Volcanology and Petrology of the Pleistocene Ash-Flow Tuffs at Newberry Volcano, Oregon” (Templeton PI, $2,600)
- 2000-2002, National Science Foundation / Oregon Collaborative for Excellence in the Preparation of Teachers (OCEPT): “Development of an Earth System Science Curriculum for Pre-Service Teachers at Western Oregon University” (Templeton, Schepige, Matson, Taylor, $9,000)
- 2000-2001, Murdock Trust Partners in Science Research Grant: “Geomorphic Hazards Assessment in West Central Oregon” (Taylor PI, $15,000)

Oregon
Theodore R. Kulongoski, Governor

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July 28, 2010

Dr. Kent Neely, Provost
Western Oregon University
Monmouth, Oregon 97361

Subject: WOU Earth Science Program Five-Year Review

Dear Dr. Neely:

The Oregon State Board of Geologist Examiners (Board) is charged with regulating the public practice of geology in Oregon. The Board understands that the Earth Science program at Western Oregon University (WOU) is scheduled for a five-year review by the Oregon University System. The Board would like to take this opportunity to express its ongoing support for WOU's Earth Science program and the greater geologic profession in the State of Oregon.

Oregon provides unique natural and geologic environments which are enjoyed by its residents and visitors alike. However, these environments can pose risks to the public that must be understood and appreciated so that enjoyment of Oregon's natural resources can be done in relative safety. In addition, as our population grows, there is increasing pressure to develop in hazardous areas, such as those that can be impacted by earthquakes, landslides, volcanoes, flooding and erosion. Changes that result from ongoing global warming can also increase hazards in areas that were previously at lesser risk. Our reliance on natural resources, including renewable and non-renewable resources, also grows as our population expands.

For these reasons, it is essential that our residents have a good understanding of the natural and geologic processes that impact our State. Strong undergraduate Earth Science programs, such as that provided at WOU, are needed to ensure that Oregon has an adequately educated population to deal with future environmental issues. Whether students pursue a professional career in Earth Science, or simply use their liberal arts education for personal growth, having a population well educated in geology will benefit Oregon through better public policy development.

The Board strongly supports WOU's Earth Science program, encourages the university to continue investing in this area, and provide further opportunities for students to learn about Oregon's natural environments. The Board licenses over 1200 geoscience professionals in the state, WOU Earth Science is making valuable contributions to our industry.

Sincerely,

Chris Humphrey, RG, CEG
Vice Chair, Oregon State Board of Geologist Examiners

Oregon
Theodore R. Kulongoski, Governor

Department of Geology & Mineral Industries
Administrative Office
800 NE Oregon Street #28, Suite 965
Portland, OR 97232
PHONE 971-673-1555
FAX 971-673-1562

July 20, 2010

Dr. Kent Neely, Provost
Western Oregon University
Monmouth, OR 97361

Re: WOU Earth Science Program

To whom it may concern:

As the State Geologist of Oregon and the Director of Oregon Department of Geology and Mineral Industries, I am writing in support of the Western Oregon University Earth Science Program. I applaud the goal of the program to produce B.S and B.A. degreed students with academic credentials sufficient to follow a path to professional geoscientists. Oregon's geology is complex, beautiful, and hazardous and we need practical geoscientists working in the industry to protect our citizens and develop our resources in a safe manner. The WOU Earth Science Program has recognized this academic need and evolved their program to answer it.

Further, having an undergraduate degree in earth sciences can prepare a student for a variety of higher degree directions. Students need a firm background in scientific inquiry, empirical observational skills, and a comfort with integrating multiple sciences into problem solving if they are considering careers in environmental sciences, natural resource law, water quality and quantity and human health.

Please do not hesitate to contact me if you have any questions.

Many regards,

Vicki S. McConnell, Ph.D., R.G.
Oregon State Geologist

cc: File

Geoscience Employment Sectors:
Trends in Student Transitions and Workforce Dynamics

Perceptions of career pathways can influence students' career choice, and the trends in job search activity and geoscience graduate student perceptions of employment sectors are similar. In an AGI/AGU survey of new graduate students, 81 percent of geoscience doctorates reported that they searched for jobs in academia, 45 percent in the government, and 31 percent in the private sector. Sixty-seven percent of recent geoscience graduates found jobs in academia, 18 percent in government, and 10 percent in private industry. Geoscience Master's graduates were less picky in their job search efforts: 58 percent searched for jobs in academia, 55 percent in the government, and 35 percent in the private sector. However, only 24 percent of geoscience Master's graduates found work in academia, 22 percent in the government, and 50 percent in private industry (21% oil & gas industry, 20% environmental industry, 9% other industry).

With approximately 1,500 geoscience graduate students transitioning into the professional workplace each year, the supply of newly trained geoscientists falls short of geoscience workforce demand and replacement needs. The majority of geoscientists in the workforce are within 15 years of retirement age. Data from federal sources, professional societies, and industry indicate this imbalance of the age of geoscientists in the profession. The percentage of geoscientists between 31 and 35 years of age is less than half of geoscientists between 51 and 55 years old. All geoscientist occupations in the government, with the exception of meteorologists and oceanographers, have experienced an age shift towards the 50 to 54 year old age group between 2003 and 2007. This shift is most pronounced in the age demographics of mining engineers and petroleum engineers.

Even in oil & gas companies, which typically offer the highest salaries of all geoscience employing industries, the supply of new geoscientists is short of replacement needs. The number of younger geoscientists in their early 30's is approximately half the number of those nearing retirement age. This number is greater than the data reported from federal agencies and professional societies. Additionally, the supply of geoscientists is not expected to meet the demand for geoscientists over the next 20 years. By 2030, the unmet demand for geoscientists in the petroleum industry will be approximately 30,000 workers.

Support activities for mining and oil & gas is the only geoscience employing industry where the demographics provide for the replacement of the older generation of

Did you know?

- Academic advisors tend to have more positive attitudes than students about career paths for students in the environmental industry, petroleum industry, academia, and K-12 education.
- 21 percent of new geoscience Master's students find jobs in the petroleum industry and 20 percent find jobs in the environmental industry.
- The percentage of women in geoscience and environmental science occupations has hovered around 30 percent since 2003.
- The majority of geoscientists in the workforce are within 15 years of retirement and the number of geoscientists needed to replace this older generation currently does not exist.

AGI's Working Definition of Geoscience Occupations

Geoscientist

Subfields: Environmental science, Hydrology, Oceanography, Atmospheric science, Geology, Geophysics, Climate science, Geochemistry, Paleontology

Studies the composition, structure, and other physical aspects of the earth. Includes the study of the chemical, physical and mineralogical composition of soils, analysis of atmosphere phenomenon, and study of the distribution, circulation, and physical and chemical properties of underground and surface waters. May study the earth's internal composition, atmospheres, oceans, and its magnetic, electrical, thermal, and gravitational forces. May utilize knowledge of various scientific disciplines to collect, synthesize, study, report, and take action based on data derived from measurements or observations of air, soil, water, and other resources. May use geological, environmental, physics, and mathematics knowledge in exploration for oil, gas, minerals, or underground water; or in waste disposal, elimination of pollutants/hazards that effect the environment, land reclamation, or management of natural resources.

Geoengineer

Subfield: Environmental

Designs, plans, or performs engineering duties in the development of water supplies and prevention, control, and remediation of environmental hazards utilizing various engineering disciplines. Work may include waste treatment, site remediation, pollution control technology, or the development of water supplies.

Subfield: Exploration

Determines the location and plan the extraction of coal, metallic ores, nonmetallic minerals, and building materials, such as stone and gravel. Work involves conducting preliminary surveys of deposits or undeveloped mines and planning their development; examining deposits or mines to determine whether they can be worked at a profit; making geological and topographical surveys; evolving methods of mining best suited to character, type, and size of deposits; and supervising mining operations. Devises methods to improve oil and gas well production and determine the need for new or modified tool designs. Oversees drilling and offer technical advice to achieve economical and satisfactory progress.

Subfield: Geotechnical

Studies the structural behavior of soil and rocks, perform soil investigations, design structure foundations, and provides field observations of foundation investigation and foundation construction.

Geomanager

Plans, directs, or coordinates activities in such fields as geoengineering and geoscience. Engages in complex analysis of geoscience principles. Generally oversees one or more professionals, but may still be active in technical work.

American Geological Institute
GEOSCIENCE CURRENTS
No. 3
14 December 2007

Competitive Starting Salaries for Geoscience Graduates

Geoscience starting salaries were competitive with other science and engineering fields in 2007. Bachelors geoscience graduates, generally employed in the environmental and hydrology industry, earned an average of $31,366 p.a. compared to $31,258 for life scientists and $32,500 for chemistry students.

Recent Masters recipients saw the highest starting salaries in the Oil and Gas industry, with an average of $81,300 p.a., according to a new study of recent geoscience graduates by AGI and the American Geophysical Union. This salary level is significantly higher than the average starting salary of all science Masters degree recipients, who earned an average of $46,873 p.a.

New doctorate recipients in all fields of science earned an average of $62,059 p.a. in the private sector, while new geosciences doctorates commanded an average of $72,600.

- Cindy Martinez

Starting Salaries for New Geoscience Masters, 2007

	Average Salary	Median Salary
Oil and Gas	81,300	82,500
Environmental Firm	47,500	45,500
Any Government	46,200	45,000

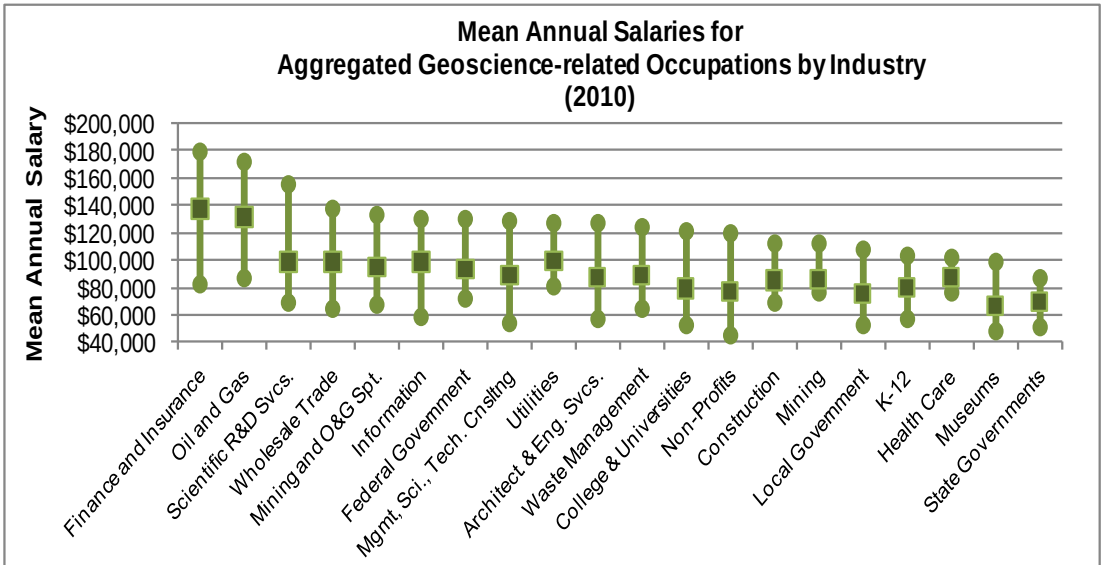
Starting Salaries for New Geoscience PhDs, 2007

	Average Salary	Median Salary
Postdoc – Academe	43,100	42,000
Postdoc - Government	55,200	53,000
Potentially Perm. Academe	51,900	52,500
Private Sector	72,600	71,000

Source: AGI/AGU study on Recent PhD and Masters Degree Recipients, 2007

American Geological Institute
GEOSCIENCE CURRENTS
No. 51
19 September 2011

2010 Salaries for Geoscience-related Occupations by Industry



Source: AGI Geoscience Workforce Program. Data derived from U.S. BLS, Occupational Employment Statistics

In 2010, average aggregated salaries for geoscience-related occupations ranged from $137,660 for geoscience-related occupations in the finance and insurance industry to $69,949 for geoscience-related occupations in state government. Salary ranges for the aggregated occupations were as narrow as $26,250 for geoscience-related occupations in the health care industry ($102,640-$76,390) to as wide as $96,960 for geoscience-related occupations in the finance and insurance industry ($179,610-$82,650).

In 2010, mean annual salaries for geoscience-related occupations ranged from $67,801 for environmental scientists to $125,900 for engineering managers. Salary ranges for geoscience-related occupations were as narrow as $16,580 for hydrologists and as wide as $100,410 for petroleum engineers. The oil and gas industry pays the highest salaries and state governments pay the lowest salaries for half of all geoscience-related occupations.

	Maximum Salary and Industry	
Engineering Managers	$148,620	Oil and Gas
Natural Science Managers	$172,950	Oil and Gas
Petroleum Engineers	$179,610	Finance and Insurance
Mining and Geological Engineers	$116,280	Oil and Gas
Environmental Engineers	$123,320	Oil and Gas
Geoscientists	$132,210	Oil and Gas
Atmospheric and Space Scientists	$112,700	Mgmt, Sci. and Tech. Consulting
Hydrologists	$82,900	Federal Government
Geographers	$84,360	Scientific R&D
Environmental Scientists	$95,680	Federal Government
	Minimum Salary and Industry	
Engineering Managers	$88,280	State Government
Natural Science Managers	$74,230	State Government
Petroleum Engineers	$79,200	State Government
Mining and Geological Engineers	$76,090	Nonmetallic Mineral Mining
Environmental Engineers	$59,570	Information
Geoscientists	$62,880	State Government
Atmospheric and Space Scientists	$81,470	Information
Hydrologists	$66,320	State Government
Geographers	$53,780	Colleges and Universities
Environmental Scientists	$56,030	Colleges and Universities

Geoscience Currents Discussion Webinar: Salary Trends and Employment Projections for Geoscience Careers

Listen to an in-depth discussion of Currents #49-53. Participation in the webinar is free.

Register at:
www.agiweb.org/workforce/webinars.html

- Leila Gonzales

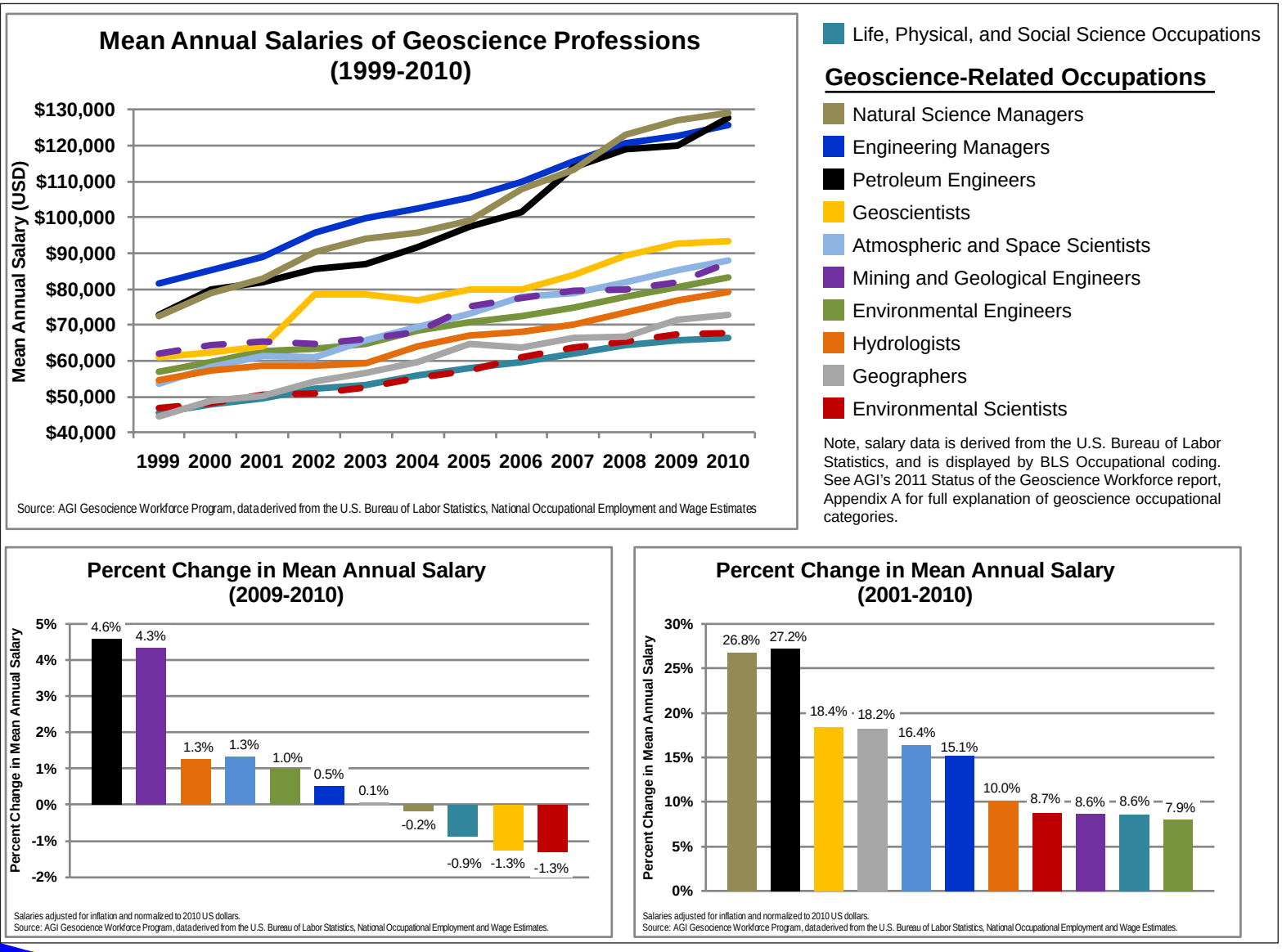
American Geological Institute
GEOSCIENCE CURRENTS
No. 49
7 September 2011

Salaries for Geoscience-related Occupations Increase by 1.1% between 2009 and 2010

Despite the lagging U.S. economy, salaries for aggregated geoscience-related occupations increased by 1.1 percent between 2009 and 2010. Aggregated salaries for all life, physical and social science occupations decreased by 0.9 percent while salaries for all U.S. occupations only increased by 0.2 percent between 2009 and 2010. (Note, all salaries were normalized to 2010 dollars).

In 2010, the top salaries for geoscience-related occupations were for natural science managers ($129,320), petroleum engineers ($127,970), and engineering managers ($125,900), and geoscientists ($93,380). Mean annual salaries for environmental scientists ($67,810) were $1,420 greater than national average for other science occupations.

Mean annual salaries for the majoirty of geoscience-related occupations increased more rapidly than for other science occupations between 2001 and 2010, except for environmental engineers. Additionally, salary growth between 2009 and 2010 increased for the all geoscience occupations except for environmental scientists and geoscientists (-1.3%), and natural science managers (-0.2%). (Note, all salaries were normalized to 2010 dollars).



- Leila Gonzales

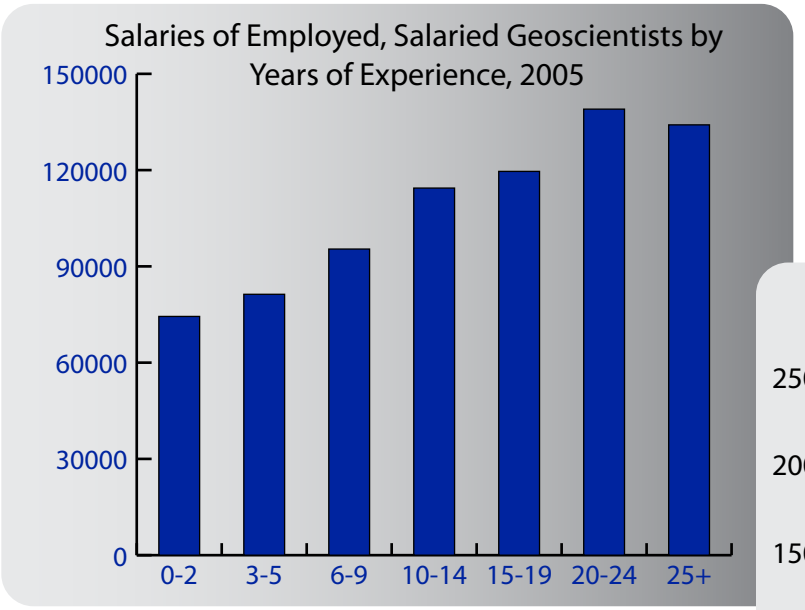
American Geological Institute
GEOSCIENCE CURRENTS
No. 5
10 March 2008

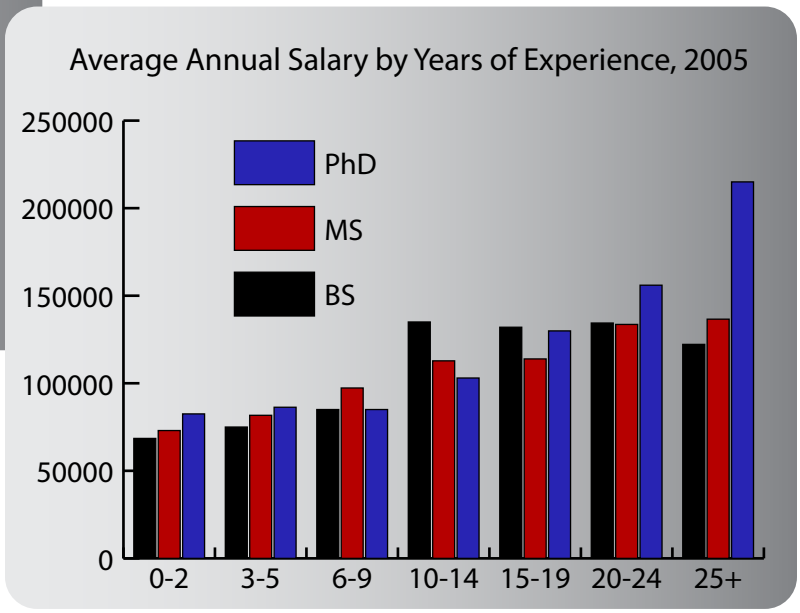
Geoscientist Salaries, by years of experience

The average salaries for geoscientists in 2005 varied by years of experience. For geoscientists employed for 0-2 years, the average salary was $74,000, a 9.7% increase over 2004's average. Geoscientists employed for 20-24 years earned an average of $139,000, which was more than a 23% increase over 2004 salaries. After 25 years of employment, average salaries dip slightly, to $138,100.

As expected, the greater the education, then generally the higher the compensation. However, given the premium on experience and small population of mid-career geoscientists in the US, even Bachelors' degree recipients can out-earn PhD and Masters degreed scientists. Geoscientists with their highest degree as the Bachelors earned an average of $135,000 with 10-14 years of experience, compared to only $103,000 for doctoral geoscientists with the same experience.

-Cindy Martinez and Chris Keane



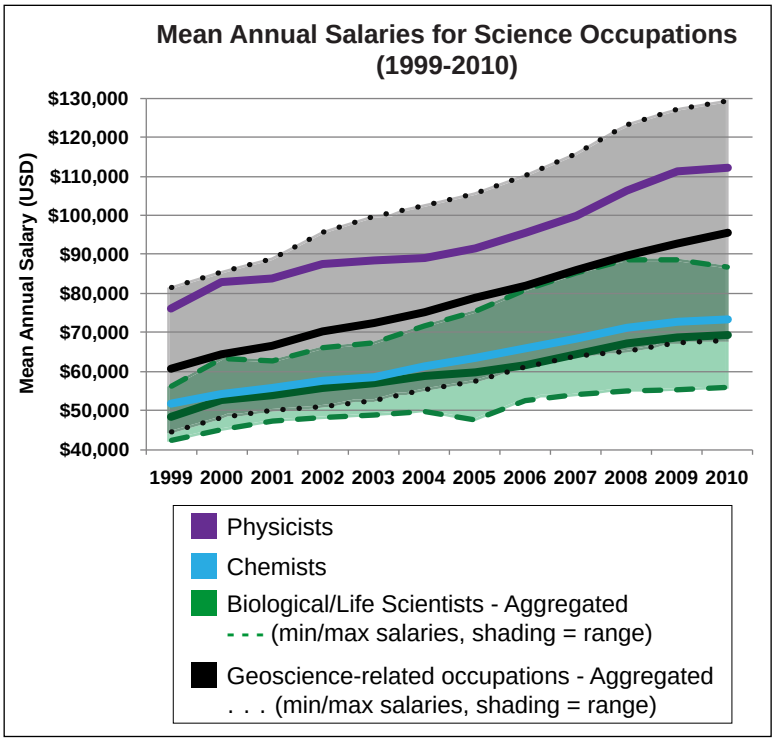


Source: CPST 2007, Salaries of Scientists, Engineers, and Technicians: A summary of Salary Surveys (data derived from MLA Resources, Inc., Geological Salary Surveys, 2004 and 2005.)

American Geological Institute
GEOSCIENCE CURRENTS
No. 50
14 September 2011

Salaries for Geoscience-related Occupations vs. Other Science Occupations

Salaries for chemists, physicists and biological/life scientists primarily fall within the range of salaries for geoscience-related occupations. Over the past decade, however, salaries for geoscience-related occupations have grown as fast or faster than salaries for these other science occupations.

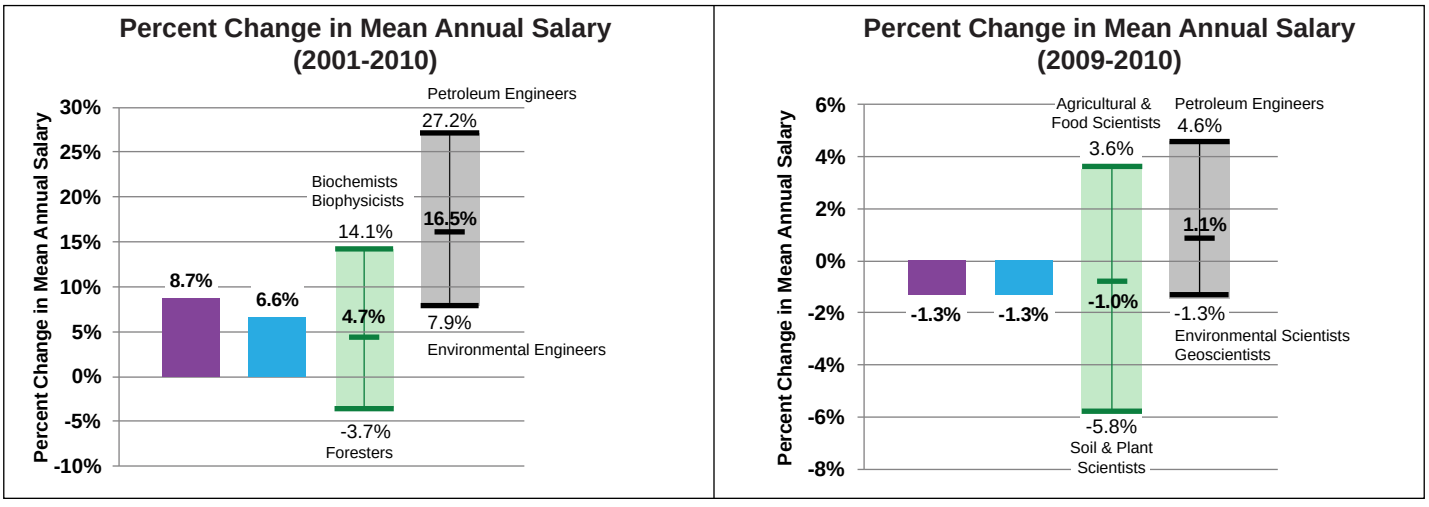


Between 1999 and 2010, mean annual salaries for physicists ranged from $12,469 to $18,649 higher than the aggregate salary for all geoscience-related occupations.

Mean annual salaries for chemists have increasingly lagged the aggregate salary for all geoscience-related occupations (-$9,061 in 1999 to -$22,267 in 2010).

Mean annual salaries for biological/life scientists overlap the lower range of salaries for geoscience-related occupations. At the higher end of biological/life scientist salaries, biochemist and biophysicist salaries follow geoscientist and atmospheric scientist salaries (~$80K). Microbiologist, general life scientist and general biological scientist salaries follow the salary trends for geographers (upper $60K-$70K), while the rest of the biological/life scientist salaries fall below that of environmental scientists (mid $60K).

Physicist, chemist, and aggregated biological/life scientist salaries dropped by 1.0 to 1.3 percent between 2009 and 2010, while aggregated geoscience-related salaries grew by 1.1 percent over the same time period. Between 2001 and 2010, physicist, chemist, and aggregated biological/life scientist salaries grew by 4.7 to 8.7 percent, while salaries for aggregated geoscience-related occupations grew by 16.5 percent. (Note, salaries were normalized to 2010 dollars for year-to-year comparisons).



Data source: AGI Geoscience Workforce Program, data derived from the U.S. Bureau of Labor Statistics, National Occupational Employment and Wage Estimates. Salaries normalized to 2010 dollars for year-to-year comparisons.

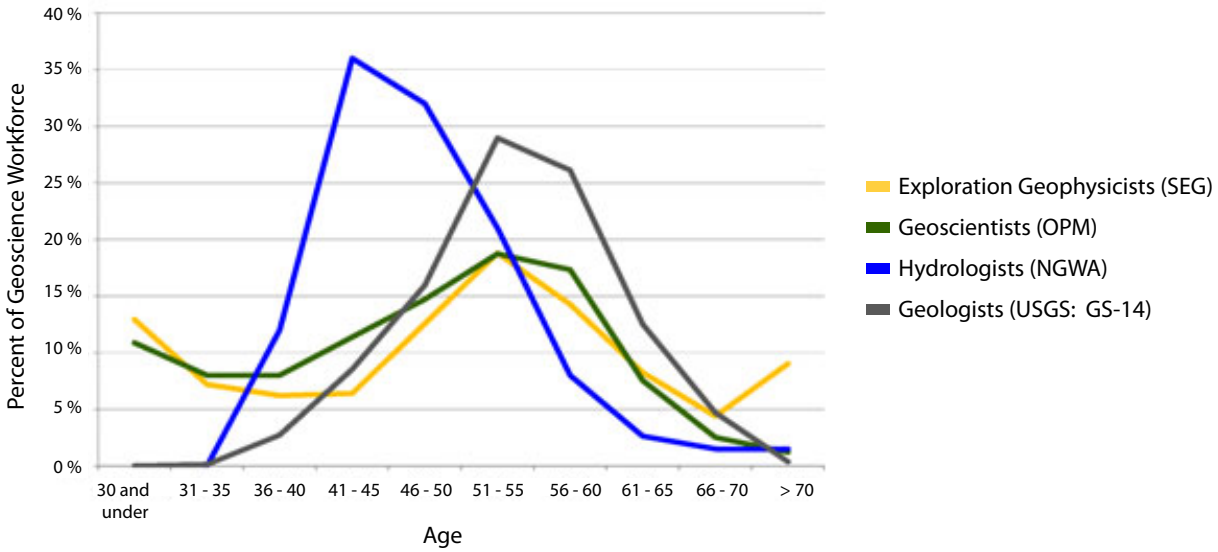
- Leila Gonzales

American Geological Institute
GEOSCIENCE CURRENTS
No. 16
09 October 2008

Geoscience Workforce Age Distribution

The majority of geoscientists in the workforce are within 15 years of retirement age. Data from federal sources, professional societies, and industry indicate the imbalance of the age of geoscientists in the profession. The percentage of geoscientists between 31 and 35 years of age is less than half of geoscientists between 51-55 years old.

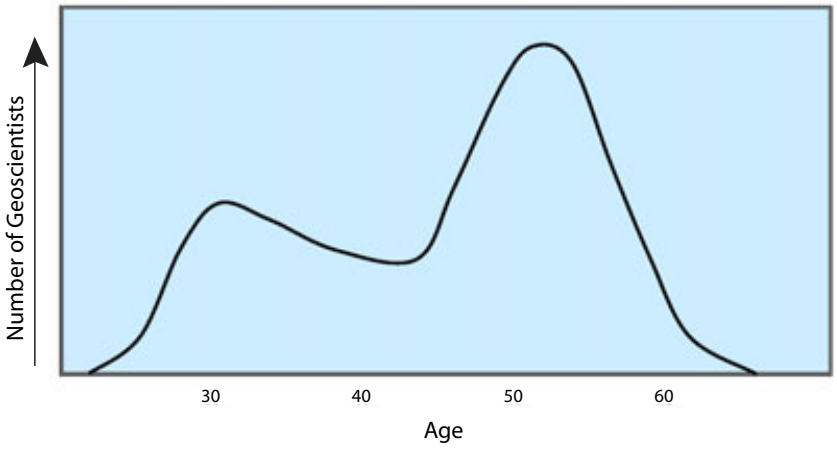
Age Distribution of Geoscientists in Industy



Data Sources: Society of Exploration Geophysicists (SEG), US Office of Personnel Management (OPM), National Groundwater Association (NGWA); *USGS Workforce Demographics and Trends*, Peter T. Lyttle 33rd IGC, Oslo, Norway, August 10, 2008 (USGS)

Even in oil & gas companies, which typically offer the highest salaries of all geoscience employing industries, the supply of new geoscientists is short of replacement needs. The number of younger geoscientists in their early 30's is approximately half the number of those nearing retirement age. This number is more than the data reported from federal agencies and professional societies.

Typical Age Distribution for an Oil & Gas Company



- Leila Gonzales

American Geological Institute
GEOSCIENCE CURRENTS
No. 53
30 September 2011

Employment Projections for Geoscience-related Occupations (2008-2018)

Employment in geoscience-related occupations is expected to grow about 23 percent between 2008 and 2018, which is much faster than the average growth of all U.S. occupations (10%). Environmental engineers are expected to see the largest growth in number of new jobs with a 31 percent growth rate, while geoscience engineering managers are expected to see the smallest growth at 10 percent.

Employment growth for aggregated geoscience-related occupations will be most robust in the professional, scientific, and technical services sector (50%) and the waste management sector (32%).

Note that these projections do not factor in replacement needs due to attrition.

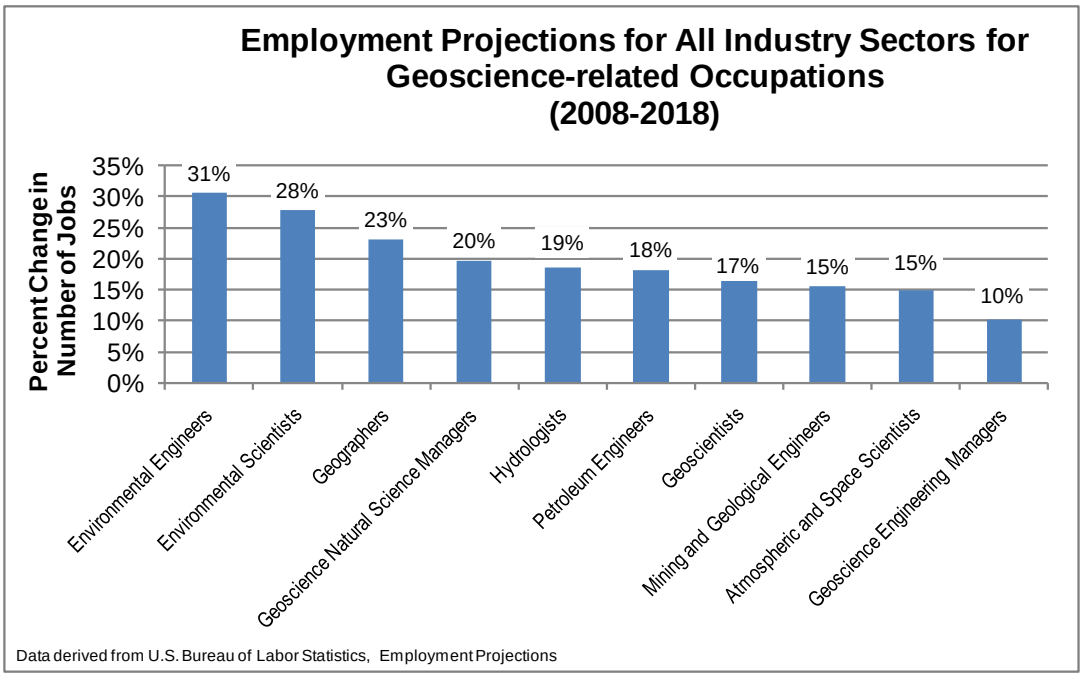
Geoscience Currents Discussion Webinar:

Salary Trends and Employment Projections for Geoscience Careers

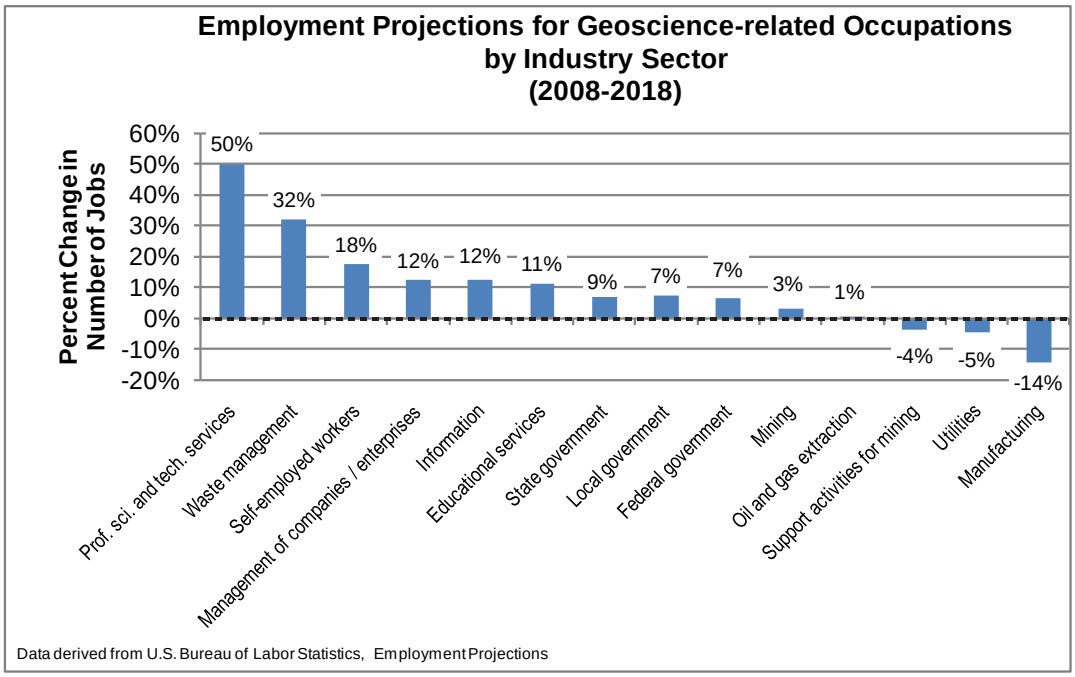
October 3, 2011, 1-1:30 pm US EDT

Listen to an in-depth discussion of Currents #49-53.
Participation in the webinar is free.

Register at:
www.agiweb.org/workforce/webinars.html



Data derived from U.S. Bureau of Labor Statistics, Employment Projections



Data derived from U.S. Bureau of Labor Statistics, Employment Projections

- Leila Gonzales

American Geological Institute
GEOSCIENCE CURRENTS
No. 52
26 September 2011

Employment Growth in Geoscience-related Occupations Over the Past Decade

Over the past year, aggregate employment in geoscience-related occupations has remained relatively steady. A few occupations (environmental engineers, mining and geological engineers, environmental scientists, geoscientists, and hydrologists) have seen a slight contraction in occupational employment between 2009 and 2010. Employment increased between 2009 and 2010 for geoscience natural science managers (+15%), geographers (+11%), and petroleum engineers (+10%).

Between 2001 and 2010, employment in geoscience-related occupations has increased by 52,377 (29%) with the largest growth occurring in petroleum engineering occupations. Since 2001, employment in petroleum engineering has increased by 16,790 (147%), with the majority of the growth occurring since 2007. Employment in two geoscience-related occupations has decreased over the past decade: hydrologists (-430) and geoscience engineering managers (-580) at -6 percent and -4 percent respectively.

Change in Employment in Science Occupations (2009-2010) and (2001-2010)

	2009-2010	2009-2010	2001-2010	2001-2010
All Occupations	-3,550,450	-3%	-883,250	-1%
All Scientists	-243,870	-19%	-3,220	-0.3%
All Engineers	-27,680	-2%	269,380	23%
All Geoscience-related Occupations	788	0.3%	52,377	29%
All Biological / Life Scientists	-5,480	-2%	119,570	91%
Physicists	3,230	24%	5,980	55%
Chemists	270	0.3%	-4,690	-6%
Geoscience-related Occupations				
Engineering Managers (Geoscience)	1,129	8%	-580	-4%
Natural Science Managers (Geoscience)	499	15%	837	27%
Environmental Engineers	-810	-2%	1,100	2%
Mining and Geological Engineers	-40	-1%	180	3%
Petroleum Engineers	2,670	10%	16,790	147%
Atmospheric and Space Scientists	320	4%	1,870	28%
Environmental Scientists	-1,840	-2%	24,260	42%
Geoscientists	-1,030	-3%	7,800	34%
Hydrologists	-240	-3%	-430	-6%
Geographers	130	11%	550	73%

Geoscience Currents Discussion Webinar:
Salary Trends and Employment Projections for Geoscience Careers
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Register at: www.agiweb.org/workforce/webinars.html

- Leila Gonzales

American Geological Institute
GEOSCIENCE CURRENTS
No. 19
11 May 2009

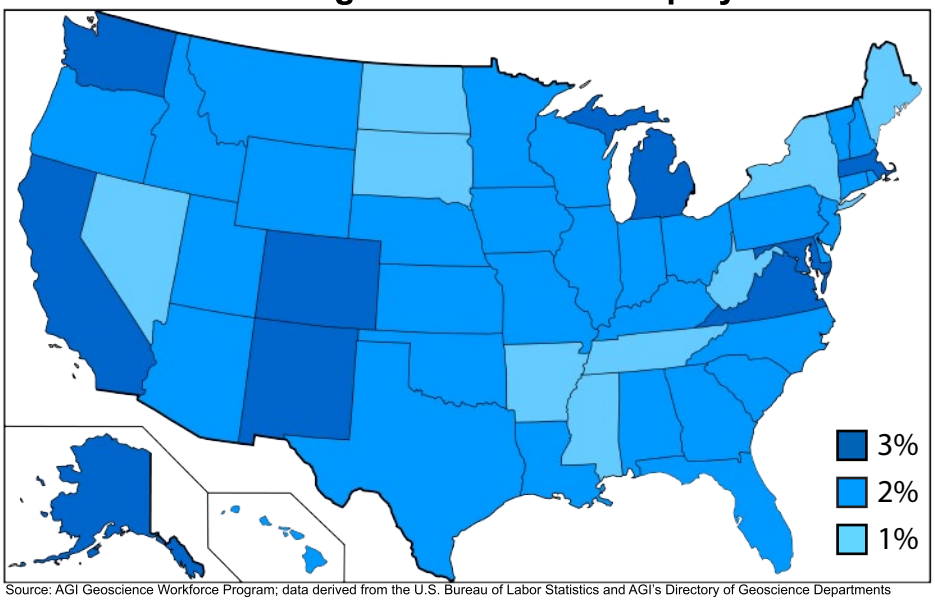
Geoscience and Science & Engineering Employment by State

Science and engineering employment comprises 1 to 3 percent of total state employment. On average, geoscience employment comprises 12 percent of science and engineering employment. States with the highest geoscience employment (as a percentage of total state science and engineering employment) are: Wyoming, Alaska, New York, Montana, South Dakota and Nevada.

States with the highest science and engineering employment as a percentage of total state employment:

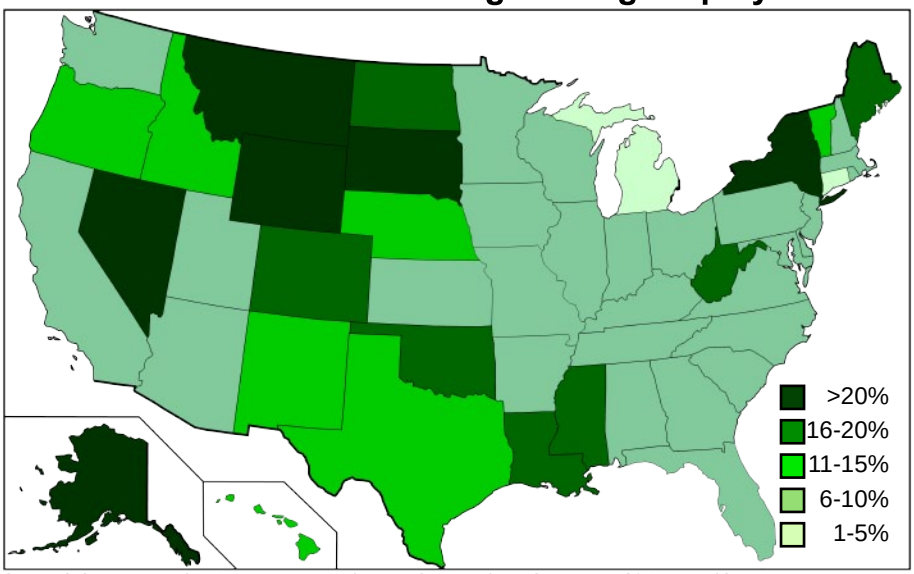
District of Columbia	5%
Arkansas	3%
California	3%
Colorado	3%
Massachusetts	3%
Maryland	3%
Michigan	3%
New Mexico	3%
Virginia	3%
Washington	3%

Science and Engineering Employment as a Percentage of Total State Employment



Source: AGI Geoscience Workforce Program; data derived from the U.S. Bureau of Labor Statistics and AGI's Directory of Geoscience Departments

Geoscience Employment as a Percentage of Total State Science and Engineering Employment



Source: AGI Geoscience Workforce Program; data derived from the U.S. Bureau of Labor Statistics and AGI's Directory of Geoscience Departments

States with the highest geoscience employment as a percentage of total state science and engineering employment:

Wyoming	41%
Alaska	32%
New York	28%
Montana	25%
South Dakota	24%
Nevada	21%

- Leila Gonzales

WESTERN OREGON UNIVERSITY
Select Earth Science Program Graduates and Employment Outcomes (2000-2011)

Tanja Aas, M.S. Ed, 2009, Science Teacher Norway
Sheila Alfsen, B.S. Earth Science, 2004, Community College Instructor
Brittnie Andrew, B.S. Earth Science, 2010, Outdoor School Leader
David Arnold, B.S. Earth Science, 2001, Construction
Tammy Baker, B.S. Earth Science, 2003, GIS Survey Analyst
Jody Becker, B.S. Earth Science, 2011, Watershed Technician
Geoffrey Bingham, B.S. Earth Science, 2003, High School Science Teacher
Matthew Buche, B.S. Earth Science, 2009, Field Geologist, Kane Geotechnical
Jeff Budnick, B.S. Earth Science, 2005, Field Hydrologist, Vancouver, WA
Kari Carr, B.S. Earth Science, 2006, High School Science Teacher
Jared Christiansen, B.S. Earth Science, 2002, Physicians Assistant, Texas
Shelby Collins, B.S. Earth Science, 2006, Park Interpreter
Tyler Cox, B.S. Earth Science, 2003, U.S. Air Force
Chandra Drury, B.S. Earth Science, 2005, Soil Hydrologist, Arizona
Jamie Fisher, B.S. Earth Science, 2006, Project Geologist, Resolution Copper, Arizona
Denise Giles, B.S. Earth Science, 2003, M.S. Geology OSU, Watershed Manager
Heather Hintz, B.S. Earth Science, 2008, Park Ranger, U.S. National Park Service
Jeremy Hull, B.S. Earth Science, 2003, Forest Products
Joshua Jones, B.S. Earth Science, 2008, Oil Field Inspector, California
Donald Kasper, B.S. Earth Science, 2009, Highway Construction
Robert Kelso, B.S. Earth Science, 2009, Science Teacher, Pt. Barrow, AK
Jeffrey Kent, B.S. Earth Science, 2006, Project Geologist, Resolution Copper, Arizona
Andy Kessinger, B.S. Earth Science, 2005, Forest Services
Ian Macnab, B.S. Earth Science, 2009, Environmental Services Manager, Allied Waste
Morgan Miller, B.S. Earth Science, 2004, Commercial Fisheries
Kristin Mooney, B.S. Earth Science, 2008, M.A. Teaching, Science Teacher
Matthew Moore, B.S. Earth Science, 2011, Geophysical Field Technician, Baton Rouge, LA
Katherine Noll, B.S. Earth Science, 2008, High School Science Teacher, International
Rachel Pirot, B.S. Earth Science, 2007, Engineering Geologist, Shannon & Wilson, Inc.
Amy Poff, B.S. Earth Science, 2002, Park Ranger, National Park Service
Seth Rogers, B.S. Earth Science, 2004, Technical Analyst, Homeland Security
Kimberly Schloeman, B.S. Integrated Science, 2001, Science Teacher
Jessica Smith, B.S. Earth Science, 2005, Forest Resources, Alaska
Mark Spiering, B.S. Earth Science, 2006, U.S. Army Officer
Ryan Stanley, B.S. Earth Science, 2010, GIS Research Technician
Alicia Thompson, B.S. Earth Science, 2009, Team Leader, Boy Scouts of America
Julie Utley, B.S. Earth Science, 2002, M.S. Geological Engineering; High School Science Teacher, TX
Thomas VanNice, B.S. Earth Science, 2010, Marine Fisheries Survey
William Vreeland, B.S. Earth Science, 2011, GIS Research Assistant
Heather Wafford, B.S. Earth Science, 2002, U.S. Custom Service Agent
Dane Wagner, B.S. Earth Science, 2008, Field Geologist, Kane Geotechnical

Summary of Earth Science Employment and Internship Opportunities at WOU (2002-2006)
(applicable to students and/or graduates with Earth Science training and bachelor's degree)

Type	Title	Employer	Location	Salary	Description
Internship	Scientific Illustrator	National Park Service	Fossil, OR	$8/hr	Paleontological illustrator
Internship	Geoscience Intern	American Geological Institute	Washington, D.C.	$1500/mo	Government affairs program
Internship	Environmental Resource Assistant	University of Oregon / RARE Program	Eugene, OR	$1250/mo	Rural oregon natural resource development
Internship	Geomorphologist - Entry	Mesa State University	Grand Junction, CO	$1200/mo	Field studies involving mountain geomorphology
Internship	Hydrologist - Entry Level	Western Kentucky University	Mammoth Cave, KY	$1500 /mo	Cave hydrology, field data collection
Internship	Hydrologist - Entry Level	Colorado State University	Fort Collins, CO	$1500 /mo	Field hydrology and data collection, forestry
Internship	Marine Geology	Monterey Bay Aquarium	Monterey, CA	$500 /wk	Sea-based marine geology, data collection
Internship	Hydrologist - Entry Level	Siuslaw National Forest	Mapleton, OR	$1500/mo	Field hydrology and data collection, forestry
Internship	Water Policy Specialists	Tualatin Valley Water District	Beaverton, OR	$1200 /mo	Water resources outreach and policy
Internship	Watershed Studies	William and Mary College	Williamsburg, VA	$1800/mo	Coastal ecology and field hydrology
Internship	Geomorphologist - Entry	US Environmental Protection Agency	John Day, OR	$12/hr	Field studies involving rivers and restoration
Internship	Water Resource Specialist	Oklahoma State University	Stillwater, OK	$1000 /mo	Soil and water resource analysis, GIS
Internship	Geologist - Entry Level	University of Arkansas	Fayetteville, AR	$1200/mo	Field geology
Internship	River Specialist	Confederated Tribes of Grand Ronde	Grand Ronde, OR	$12/hr	Field hydrology and data collection, stream restoration
Internship	Stream Ecologist	Oregon State University	Corvallis, OR	$1500/mo	River sampling, nitrate studies
Internship	Global Change Intern	Harvard University	Cambridge, MA	$1500/mo	Global climate change research
Internship	Coastal Geomorphologist	US Environmental Protection Agency	Newport, OR	$8/hr	Coastal ecology and field hydrology
Internship	Environmental Technician	New Mexico Environment Dept.	Santa Fe, NM	$12/hr	Environmental clean up
Internship	Water Policy Specialists	Healthy Waters Institute / Trout Unlimited	Bend, OR	$18,000/yr	River restoration, fish habitat
Internship	Fluvial Geomorphologist	Siuslaw Watershed Council	Mapleton, OR	$1500/mo	Water quality, data analysis
Internship	Geologist - Entry Level	Little Missouri Badlands	North Dakota	$1600/mo	Field mapping and surveying
Permanent	Environmental Monitoring Technician	Sanders and Associates, Inc.	Portland, OR	$33,000/yr	GIS, site surveying, water quality monitoring
Permanent	Geotechnical Assistant	PBS Environmental	Portland, OR	$29,000/yr	Soil sampling, compaction testing, site surveying
Permanent	Geologist - Entry Level	Aerotek Environmental and Engineering Consulting	Portland, OR	$17-20 /hr	Drilling / construction
Permanent	Staff Geologist	Aerotek Environmental and Engineering Consulting	Concord, CA	$40,000/yr	Environmental clean up
Permanent	Field Geologist	Aerotek Environmental and Engineering Consulting	Internatonal	$40,000/yr	Environmental clean up
Permanent	Geologist - Entry Level	Aerotek Environmental and Engineering Consulting	Sacramento, CA	$40,000/yr	Environmental clean up
Permanent	Geologist - Entry Level	Aerotek Environmental and Engineering Consulting	Fairfield, CA	$40,000/yr	Soil and water sampling
Permanent	Environmental Geologist	Aerotek Environmental and Engineering Consulting	Indianapolis, IN	$35,000 /yr	Drilling, environmental clean up
Permanent	Hydrogeologist- Entry Level	Washington Dept. of Ecology	Olympia, WA	$40,000/yr	Groundwater contamination
Permanent	Watershed Coordinator	Calapooia Watershed Council	Albany, OR	$40,000/yr	Watershed restoration, fish enhancement
Permanent	Forest Hydrologist	USDA Forest Service	Hot Springs, AR	$45,000 /yr	Fied hydrology and data collection, forestry
Permanent	Watershed Coordinator	John Day Watershed Council	Monument, OR	$35,000 /yr	Watershed restoration, fish enhancement
Permanent	District Coordinator	John Day Watershed Council	Monument, OR	$35,000 /yr	Water resource conservation
Permanent	Geomorphologist - Entry	Northwest Indian Fisheries Commission	Olympia, WA	$30,000 /yr	Field studies related to fish habitat and stream restoration
Permanent	Field Geologist - Entry	Oregon Dept. of Transportation	Roseburg, OR	$3600 /mo	Geotechnical / highway construction
Permanent	Hydrogeologist- Entry Level	Washington Dept. of Ecology	Olympia, WA	$3600 /mo	Groundwater and surface water quality
Permanent	Watershed Hydrologist	U.S. Forest Service	Fresno, CA	$47,000 /yr	Stream flow data collection
Permanent	Water Program Manager	Deschutes River Conservancy	Bend, OR	$45,000 /yr	Water rights management
Permanent	Water Education Coordinator	Santiam Watershed Council	Salem, OR	$18,000 /yr	Water resources, education and outreach
Permanent	Geologist - Entry Level	Oregon Dept. of Transportation	Salem, OR	$42,000 /yr	Geotechnical / highway construction; field surveying
Permanent	Hydrologic Technician	U.S. Forest Service	Shaver Lake, CA	$44,400/yr	Field hydrology and data collection, forestry
Permanent	Lab Technician	University of California	Irvine, CA	$4000/mo	Sample preparation for chemical analysis
Permanent	Cartographic Technician	Bureau of Land Management	Prineville, OR	$32,000 /yr	Map preparation and data management
Permanent	Fluvial Geomorphologist	Parish Geomorphic, LTD	Sacramento, CA	$42,000 /yr	Field data collection, analysis of river systems
Permanent	GIS Technician	Geosolv, Inc.	Tangent, OR	$35,000 /yr	Geographic information systems, data management
Permanent	Hydrologic Technician	Sierra National Forest	Prather, CA	$43,000 /yr	Field hydrology and data collection, water quality
Permanent	Environmental Field Technician	GeoEngineers, Inc.	Tacoma, WA	$28,000 /yr	Soil and water sampling
Permanent	Hydrologist - Entry Level	Bryce Canyon National Park	Utah	$43,000/yr	Water quality, stream restoration
Permanent	Hydrogeologist- Entry Level	Buck Engineering	Cary, NC	$44,000 /yr	Groundwater, well installation, contamination
Permanent	Watershed Specialist	US Forest Service	San Diego, CA	$53,000 /yr	Watershed restoration, invasive plant remediation

Summary of Earth Science Employment and Internship Opportunities at WOU (2002-2006)
(applicable to students and/or graduates with Earth Science training and bachelor's degree)

Type	Title	Employer	Location	Salary	Description
Permanent	Hydrologic Technician	Walla Walla Basin Watershed Council	Milton-Freewater, OR	$13/hr	Field hydrology and data collection, water quality
Permanent	GIS Analyst	US Forest Service	Seattle, WA	$52,200 /yr	Geographic information systems, project management
Permanent	Partnership Coordinator	Oregon Invasive Weed Management Program	Salem, OR	$3500/mo	Invasive weed monitoring and management
Permanent	Geologist - Entry Level	Geomatrix Consultants	San Francisco, CA	$48,000 /yr	Environmental clean up
Permanent	Soil Survey Technician	US Natural Resources and Conservation Service	Portland, OR	$33,700 /yr	Soil mapping
Permanent	Watershed Coordinator	Klamath River Watershed Council	Klamath Falls, OR	$39,000 /yr	Water resources, education and outreach
Permanent	Environmental Specialist	New Mexico Surface Water Bureau	Santa Fe, NM	$22/hr	Water quality, data analysis
Permanent	Watershed Coordinator	Alpine County Californai	Alpine, CA	$17/hr	Water resources, education and outreach
Permanent	Watershed Assessment Technician	Grass Valley Watershed Council	Wasco, OR	$10/hr	Water resources and conservation
Permanent	Resource Management Technician	Polk County Soil and Water Conservation District	Dallas, OR	$2000/mo	Soil and water resources and conservation
Permanent	Water Quality Specialist	Walla Walla Basin Watershed Council	Milton-Freewater, OR	$30,000/yr	Water quality, data analysis
Permanent	GIS Specialist	Green Diamond Resource Co.	Shelton, WA	$35,000 /yr	Geographic information systems, data management
Permanent	Hydrologist - Entry Level	South Texas Water District	Austin, TX	$46,000 /yr	Water resource development, water quality
Permanent	Project Manager	Coos Bay Watershed Council	Coos Bay, OR	$38,000/yr	GIS, river restoration projects
Permanent	Field Survey Technician	US Natural Resources and Conservation Service	Bend, OR	$38,588/yr	Watershed analysis, fluvial geomorphology
Permanent	Watershed Coordinator	Luckiamute Watershed Council	Monmouth, OR	$1250/mo	Water resources, education and outreach
Permanent	Yaquina Basin Planning Coordinator	Yaquina Watershed Council	Newport, OR	$15/hr	River restoration, fish habitat
Permanent	Hydrologic Technician	Applegate Watershed Council	Jacksonville, OR	$13/hr	Field hydrology, data collection, water quality
Summer	Science Camp Naturalist	Oregon Museum of Science and Industry	Clarno, OR	$8/hr	Teen camp guide
Summer	Research Assistant	Oregon State University	Corvallis, OR	$10/hr	Field surveying, geomorphology in Oregon Coast Range
Summer	Hydrologic Technician	Andrews Experimental Forest	Eugene, OR	$2000/mo	Field hydrology and data collection, forestry
Summer	Research Assistant -Hydrology	Oregon State University	Corvallis, OR	$10/hr	Field studies, floodplain botany and geomorphology
Summer	Hydrologic Technician	Oregon State University	Corvallis, OR	$12/hr	Field hydrology and data collection
Summer	Hydrologic Technician	US Environmental Protection Agency	Corvallis, OR	$3000 /mo	Field hydrology and data collection, water quality
Summer	Hydrologic Technician	U.S. Forest Service	Kings River, CA	$3000 /mo	Field hydrology and data collection, water quality
Summer	Park Ranger	US Forest Service	Mt. St. Helens	$3600 /mo	Ranger
Summer	Recreation Technician - River Patrol	Bureau of Land Management	Prineville, OR	$32,000 /yr	Ranger patrol
Summer	Stream Maintenance	City of Salem	Salem, OR	$14/hr	Stream restoration and clean up
Summer	Hydrologic Assistant	US Forest Service	Corvallis, OR	$10/hr	Field hydrology and data collection, water quality
Summer	Geophysics Technician	University of Alaska	Fairbanks, AK	$10/hr	Field assistant, geophysical survey technician
Summer	Physical Science Technician	US Environmental Protection Agency	Newport, OR	$1300 /mo	Field and lab technician, data collection
Summer	Research Technician	OSU Forest Science	Mapleton, OR	$10/hr	Water and ecological sampling
Summer	Technical Assistant	Marion County Public Works	Salem, OR	$10/hr	Field work, surveying, maintenance
Summer	Geomorphology Field Assistant	Oregon State University	Corvallis, OR	$10/hr	Fluvial hydrology and spring hydrology
Temporary	Field Survey Technician	Western Oregon University	Monmouth, OR	$9/hr	Botanical field surveying
Temporary	GIS Technician	Western Oregon University	Monmouth, OR	$8/hr	Geographic information systems, data management
Temporary	Research Assistant	Western Oregon University	Monmouth, OR	$8/hr	Geology and geomorphology research
Temporary	Teaching Assistant	Western Oregon University	Monmouth, OR	$8/hr	Grader and instructional assistant to geology faculty
Temporary	Hydrologist - Entry Level	U.S. Geological Survey	Portland, OR	$42,000 /yr	Groundwater and surface water quality
Temporary	GIS Technician	Oregon Dept. of Forestry	Salem, OR	$2200 /mo	Geographic information systems, data management
Temporary	Paleontology Lab Assistant	Western Oregon University	Monmouth, OR	$200/mo	Fossil sample curation
Temporary	GIS Technician	Oregon Dept. of Agriculture	Salem, OR	$10/hr	Geographic information systems, data management
Temporary	Teaching Assistant	Oakham School	England	$200 / mo	Instructional science assistant
Temporary	Research Assistant	Southern Illinois University	Carbondale, IL	$1000/mo	River systems and geomorphology
Temporary	GIS/GPS Technician	US Fish and Wildlife Service	Malheur Wildlife Refuge, OR	$1300/wk	Geographic information systems, data management
Temporary	Water Quality Specialist	Oregon State University	Corvallis, OR	$12/hr	Water quality sampling and lab analysis, stream ecology
Temporary	Groundwater Technician	Oregon State University	Corvallis, OR	$10/hr	Soil and water sampling, well installation
Temporary	GIS Technician	Oregon Dept. of Forestry	Salem, OR	$2200 /mo	Geographic information systems, data management
Temporary	Fluvial Geomorphologist	Ohio University	Athens, OH	$43,000 /yr	Fluvial geomorphology, river systems and analysis
Temporary	Hydrologic Technician	Walla Walla Basin Watershed Council	Milton-Freewater, OR	$13/hr	Field hydrology and data collection, water quality
Temporary	GIS Technician	City of Salem	Salem, OR	$22/hr	Geographic information systems, data management

Oregon State Professional Geologists

Licensing Requirements

B.S. Earth Science

University Study

Geology-related degree
45 quarter-hours credit

Environmental Remediation

Fundamental Geology Examination

Minimum Score: 70% passing

Geologist-in-Training

Work Experience

5 Years post-bac work experience
Partial credit for graduate studies

Slope Stabilization

Oregon Professional Geologists- Protecting state resources for future generations

Aquifer Analysis

Practice Geology Examination

Minimum Score: 70% passing

CEG Requires RG and EG Experience

Engineering Geology Examination

THE PROFESSIONAL PRACTICE OF GEOLOGY IN OREGON
OREGON STATE BOARD OF GEOLOGIST EXAMINERS

MISSION STATEMENT

The mission of the Board of Geologist Examiners is to help assure the safety, health, and welfare of Oregonians with regard to the public practice of geology through:

Licensing of those engaged in the public practice of geology;
Response to complaints from the public and members of the profession;
Public education directed at appropriate regulatory communities;
Cooperation with closely related Boards and Commissions;
Attention to ethics; and
Systematic outreach to counties, cities, and registrants.

EXAMINATIONS

Geology Fundamental Examination

(GF) To qualify for the Geology Fundamental exam, an applicant shall have graduated from an accredited college or university. A major in geology, engineering geology or geological engineering, or related geological sciences will be accepted. An applicant may have completed 45 quarter hours or the equivalent in geological science courses leading to a major in geology, of which at least 36 hours or the equivalent were taken in the third or fourth year, or in graduate courses. Applicants shall submit a stamped and signed official transcript in the Registrar's original sealed envelope for review by the Board.

Geology Practice Examination

(GP) To qualify for the Geology Practice exam, an applicant must have a minimum of seven years experience. This experience is gained through both university studies and job experience. NOTE: An applicant must have passed the Geology Fundamental exam or be scheduled to sit for the Fundamental portion of the examination concurrent with the Practice portion

PROFESSIONAL EXPERIENCE

ORS 672.555 (A) states that each year of undergraduate study in the geological sciences shall count as one year of training up to a maximum of two years, and each year of graduate study shall count as a year of training up to a maximum of three years. (B) Total credit for undergraduate and graduate study shall in no event exceed a total of four years toward meeting the requirement for at least seven years of geological work.

One year of experience is granted for each year spent working under the supervision of a registered geologist; however, a minimum of 3 years must be completed before any credit is granted. One year of experience is granted for each year spent in responsible charge; however, a minimum of 5 years must be completed before any credit is granted. One year of experience is granted for every 4 years spent teaching or doing research in geology at a school which grants graduate degrees in geology; but credit shall apply only toward the 5-year minimum spent in responsible charge.

STATE LAW GOVERNING PROFESSIONAL PRACTICE OF GEOLOGY

ORS 672.555 Application; qualifications for certificates of registration; rules.

(1) An application for registration as a geologist shall show the applicant's education and a detailed summary of the geological work performed by the applicant.

(2) To be eligible for a certificate of registration, an applicant shall meet each of the following minimum qualifications:

(a) Have either:

(A) Graduated from an accredited college or university with a major in geology, engineering geology, geological engineering or related geological science approved by the State Board of Geologist Examiners; or

(B) Completed and passed 45 quarter hours or the equivalent in geological science courses.

(b) Have at least seven years of geological work that includes a minimum of three years of geological work under the supervision of a registered geologist or a minimum of five accumulative years' experience in responsible charge of geological work. The applicant may demonstrate or receive credit for the required seven years of professional geological work in the following ways:

(A) Each year of completed undergraduate study in the geological sciences shall count as one year of training up to a maximum of two years, and each year of completed graduate study shall count as one year of training up to a maximum of three years.

(B) Total credit for undergraduate and graduate study may not exceed a total of four years toward meeting the requirement for at least seven years of geological work.

(C) The board may consider in lieu of geological work required, the cumulative total of geological work or geological research completed by persons teaching at the college or university level, provided such work or research is equivalent to the professional requirements specified in this subsection.

(D) The board shall determine the applicability of geological work by reviewing the applicant's documented and referenced geological work history in a responsible position. The board shall determine the adequacy of the required supervision and experience in accordance with standards adopted by rule by the board.

(c) Have successfully fulfilled the examination requirements, established by the board, designed to demonstrate that the applicant has the necessary knowledge and skill to exercise the responsibilities of the public practice of geology.

(3) A certificate of registration as a "geologist in training" may be granted to a person who has fulfilled the requirements described in subsection (2)(a) and (c) of this section.

(4) The board shall, by rule, adopt the minimum coursework requirements that an applicant must meet in order to satisfy subsection (2)(a) of this section. [1977 c.612 §§6,7; 1981 c.295 §2; 2005 c.9 §1]

WESTERN OREGON UNIVERSITY

College of Liberal Arts & Sciences - Change of Major/Advisor

Turn in form to: Academic Advising & Learning Center, APSC 401

NOTE: This form does not take the place of either the "Degree Plan" or the "Application for Degree" form.

A degree plan needs to be completed with your major advisor in your program of study as soon as possible, but no later than your Junior Year.
Information outlining the steps to be followed in obtaining and filing a degree plan is available at the Registrar's Office.

• *Three terms before you expect to graduate, you MUST complete an "Application for Degree" form. (The form is available in the Registrar's Office).* •

DO YOU HAVE A DEGREE PLAN ON FILE WITH THE REGISTRAR'S OFFICE? ☐ Yes ☐ No

Date: _____ **Phone Number:** _____ **Catalog Year Requirements:** _____

Name (Please Print): _____

Last First MI

Student ID Number: _____ **WOU Email:** _____

Check all boxes that apply to you.

☐ Undergraduate Student ☐ Post – Baccalaureate ☐ Double Major ☐ Double Degree **(Requires 2 Majors & 1 Minor)**

☐ Bachelor of Arts (BA) ☐ Bachelor of Science (BS) ☐ Bachelor of Music (BM) ☐ Bachelor of Fine Arts (BFA)**

EXPLORATORY (UNDECIDED)

☐ **I am currently exploring majors.**

☐ **My Pre-professional program(if any) is:** _____

(Pre-professional programs do not take the place of majors or minors. Examples are: Pre-Medicine, Pre-Law, Pre-Nursing)

MAJORS FOR THE COLLEG E OF LIBERAL ARTS & SCIENCES *(Check All Appropriate)*

LIBERAL ARTS & STUDIES
- Interdisciplinary Studies**…..…0IDS ☐
- International Studies:
  - African* ……..0INT-AF ☐
  - Asian* ……..0INT-AS ☐
  - Canadian* ……0INT-CA ☐
  - European ……....0INT-EU ☐
  - French* (pre-2008-01) …..0INT-FS ☐
  - German* (pre-2008-01) …0INT-GS ☐
  - Latin American* …..…..…0INT-LA ☐

BUSINESS & ECONOMICS
- Business ……..……5BUS ☐
- Economics ……..……4BEC ☐

COMPUTER SCIENCE
- Computer Science ……...5CSC ☐
- Computer Science/Math ……...5CSM ☐
- Information Systems ……...5ISY ☐

CREATIVE ARTS
- The Arts ……....1ARS ☐
- Art…….……1ART ☐
- Contemp. Music (BM) …….....1CMS ☐
- Contemp. Mus. Theatre (BM) 1CMT ☐
- Dance…….....1DAN ☐
- Music……1MUS ☐
- Theatre Arts……..……1THA ☐
- Thtr. Arts Musical Theatre .1THA-MT ☐
- Theatre (BFA): **
  - -Actor-Training ……1THR-ACT ☐
  - -Production Training …1THR-PRO ☐
- Theatre-Production (BFA) ** *(Pre-2010)*
  - -Costume Design ……1THR-CD ☐
  - -Lighting Design ….....1THR-LD ☐
  - -Scenic Design ……1THR-SC ☐
  - -Stage Management …….1THR-SM ☐
  - -Technical Production ….1THR-TP ☐

HUMANITIES
- English-Linguistics* ……...2ENG-LG ☐
- English-Literature* ……2ENG-LT ☐
- English-Writing* ……...2ENG-WR ☐
- English Concent. Needed*...2ENG-00 ☐
- Spanish*…….....2FLS ☐
- German Studies* ……...2GER ☐
- Humanities ……...2HUM ☐
- Philosophy……..2PHL ☐
- Communication Studies ……...2COM ☐

MATHEMATICS
- Mathematics ……..3MTH-MT ☐
- Mathematics Applied ……..3MTH-AP ☐

NATURAL SCIENCE
- Biology:
  - Botany ...…….....3BIO-BO ☐
  - Ecology …….....3BIO-EC ☐
  - General Biology ……..3BIO-GN ☐
  - Molecular/Cell ....……....3BIO-MC ☐
  - Pre-Professional Bio. Cen. 3BIO-PP ☐
  - Zoology ……...…3BIO-ZO ☐
- Chemistry:
  - Forensic Chemistry ……...3CHM-FC ☐
  - General Chemistry…...…3CHM-CH ☐
  - Medicinal Chem. & Pharm .3CHM-MC ☐
  - Physics/Chemistry .....3PSN-CP ☐
- Earth Science ...…….....3PSE ☐

PSYCHOLOGY
- Gerontology .....……4GRO ☐
- Pre-Psychology* * …….……..4PPS ☐

SOCIAL SCIENCE
- Anthropology (pre-2008) ……...4ANT ☐
- Anthropology:
  - Thesis Option* ……4ANT-TH-BA ☐
  - Non-Thesis Option ……...4ANT ☐
- Criminal Justice* * …….....4CRJ ☐
- Pre-Fire Services Administration ….4PFS ☐
- Geography …….……..……..4GEO ☐
- History…….....4HST ☐
- Political Science ……..4PSC ☐
- Public Policy & Administration:
  - City/County Gov't ……...4PPA-CC ☐
  - Corrections/Law Enf .....4PPA-CL ☐
  - Human Resources ….....4PPA-HR ☐
  - Health Policy & Admin ....4PPA-HP ☐
  - International ……...…….4PPA-IN ☐
  - Management ……...4PPA-MG ☐
  - State & Fed Gov't …….4PPA-SF ☐
- Sociology ...…….....4SOC ☐
- Social Science (pre-2008) ….……4SSC ☐
- Social Sci. Concent. Needed ...4SSC-00 ☐
  - Anthropology ...……4SSC-AN ☐
  - Criminal Justice …….....4SSC-CJ ☐
  - Geography …….....4SSC-GE ☐
  - History …….....4SSC-HS ☐
  - Political Science ……4SSC-PS ☐
  - Sociology ……..4SSC-SO ☐

My New Major Advisor: _____ **My Minor Advisor:** _____

My Minor is: _____

* **Bachelor of Art Only**

Revised 10/2011

** **BFA, Criminal Justice, Fire Services Admin, Interdisciplinary Studies, & Psychology – Requires Department/Advisor Approval**