Department of Geology

Five-Year Review – Self Study – 2014 to 2015

Prepared by the
Geology Faculty

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Department of Geology Mission Statement

To engage students through lecture-, field- and laboratory-based courses, and to train them to identify and interpret the materials, structures, processes and history of the Earth. To provide our graduates with the skills needed to pursue careers in education, government, research, and industry, particularly within California. To provide our faculty with opportunities to create and apply knowledge in the earth sciences and to communicate scientific understanding to students, peers, and the communities we serve. – Mission statement proposed and passed unanimously by Geology Faculty during 2008.

Purpose of Our Program

The geology program prepares graduates for professional employment in industry or government, for graduate studies in geology or related fields, and for general employment in fields requiring a broad understanding of the natural sciences, such as elementary and junior high school instruction. The underlying core values and philosophies of our program are elucidated in our Mission Statement, and the Mission Statement of Sonoma State University. The most significant co-curricular activities that support program goals include service opportunities (such as the Geology Club), departmental colloquia, travel to professional meetings and to other institutions' field methods camps, faculty-student mentoring experience, including independent study, and internships.

Executive Summary

In the current review cycle, the Geology Department at Sonoma State University is a **productive** and **thriving** component of the School of Science and Technology. Our faculty members are demonstrably innovative in pedagogy and scholarship, and we work as interdisciplinary scholars. We prepare students for graduate school and the professional workforce, and we do this as well as, or better than, any geology department in the United States. Our graduates go on to take the abundant and high paying jobs that are await them in geological, geoscience, and geotechnical fields. They also go to top tier graduate schools, often Research I universities, and they have a high rate of passage of the Professional Geologist exam administered by the State Board of Registered Geologists in Sacramento.[1]

"Keep away from people who try to belittle your ambitions. Small people always do that, but the really great make you feel that you, too, can become great." - Mark Twain

Introductory Remarks

Geology: We are the New Darwins

Geologists have many role models, one of whom is well known to everyone who works in Darwin Hall. Charles Darwin (1809-1882) was first and foremost a geologist.[2] All of his early success and widespread reputation derived from his geological and paleontological observations on the voyage of HMS *Beagle* during 1831-1836. His extensive rock and fossil specimens, and notes and sketches and observations were sent back to England on ships multiple times during the *Beagle* voyage to Sir Charles Lyell (1797-1875), the father of modern geology, who presented Darwin's finding to the Geological Society of London. Upon his return to England in 1836, Darwin was already famous as a geologist and was made a Fellow of the Geological Society of London. In the summer of 1831 before departing on the *Beagle* voyage, Darwin was the field assistant for Adam Sedgwick (1785-1873) who named the Cambrian Period in 1835 as the earliest division of geological time to contain animal fossils based on trilobite fossils collected with Darwin in the Welsh Borderlands. Darwin was a ***public*** geologist and a ***private*** biologist for the 20 years following the return of HMS *Beagle*.

Fieldwork for Darwin was an important part of his training before the *Beagle* voyage and certainly during the *Beagle* voyage itself. It was fieldwork, and only fieldwork, that made Darwin who he is today. And it is fieldwork that distinguishes the geology program at SSU from other campus majors.

Here at Sonoma State University, the geology faculty accompany both geology and earth science majors on field trips to rocks of Cambrian age, thus walking in the footsteps of Sedgwick and Darwin. In those Cambrian aged rocks located in the Death Valley area and in western Nevada and in the Canadian Rockies, students and faculty conduct geological mapping exercises, the measurement of the rock layers to prepare a stratigraphic column, and the collection of fossils dating to more than 500 million years old, including abundant trilobite fossils. Just like Darwin. Here at SSU Geology, *we are the new Darwins.*

Back on the SSU campus, the Department of Geology is housed in Charles Darwin Hall, whose importance in the history of geology has been eloquently and succinctly summarized in the 485-page book published in 2005 by Cornell University Press by science historian Sandra Herbert titled, *Charles Darwin, Geologist*. All geologists know, and others should know and appreciate, that only later in life did Darwin branch out into biological topics and publish in that field, for which his is rightly well known, particularly for natural selection.

Geology at Sonoma is alive and well and expanding and thriving. In many ways it is the model department for its contributions to teaching, pedagogy, scholarship, and service. The one thing Geology needs more of is tenure-track positions to enhance its successful mission at Sonoma State University, as pointed out by our external reviewers in 2009 (Dr. David Bice) and in the current cycle (Dr. Russell Shapiro). We welcome additional tenure-track faculty as soon as possible to join our exemplary department to continue and extend our innovative and interdisciplinary contributions.

"I cannot promise to teach you all geology, I can only fire your imaginations."

SSU Geology Has a Tangible Connection to the Past.

Adam Sedgwick (1785-1873), pictured above, one of the founders of modern geology, proposed the Devonian period of the geological timescale, part of the Paleozoic era, a time long before the dinosaurs of the Mesozoic Era. He also proposed the Cambrian period, the earliest period of the Paleozoic, based on field work that he did with a young Charles Darwin on trilobite fossils in Wales in the summer of 1831, just before Darwin set off on the 5-year voyage of HMS *Beagle*. Though Sedgwick had guided the young Darwin in his early study of geology, Sedgwick himself was an outspoken opponent of Darwin's subsequent theory of evolution by means of natural selection. The Sedgwick Museum of Earth Sciences at Cambridge University in England is named for him. It contains rocks and fossils collected by Darwin.

Geology is All Around You

Geology is scenery, from the verdant highlands of Scotland and the White Cliffs of Dover, to the fiery slopes of the Big Island of Hawaii, to the impressive depths of the Grand Canyon in Colorado, Copper Canyon in Mexico, to Waimea Canyon on Kauai, and Yosemite Valley right here in California. From Death Valley to Yosemite Valley, to the Matterhorn in the Swiss-Italian Alps, to Niagara Falls in up state New York, to the Olduvai Gorge and the Great Rift Valley in eastern Africa. Anywhere that anyone goes on vacation is likely a place of spectacular geology.

Understanding the ubiquity of geology is crucial to understanding how important the role of the Department of Geology is in the scholarly life of Sonoma State University. It is all geology. Very last bit of Earth. And geologists study these beautiful and spectacular places, interpret the history of these areas, and present that knowledge to the general public. Geologists are, on one very real level, the best tour guides in the world.

• The Department of Geology is an integral part of the fabric of the liberal arts and sciences curriculum at Sonoma State University.

• The SSU Department of Geology is renown across the country for having the most extensive geology field-training program of any college or university in the United States.

• SSU Geology is a highly productive, thriving, and growing department. In any given semester, there are often 650 students taking geology classes on campus.

• SSU Geology has more than doubled its number of majors since 2008 and it has an impressively high graduation rate within the School of Science and Technology.

• SSU Geology has the largest endowed scholarship on the SSU campus, the Geoffrey Davidson Woodward Memorial Scholarship. Interest earnings defer the cost of summer field camp for top graduating seniors.

• SSU Geology faculty receive research funding from the most prestigious federal granting agency, the National Science Foundation.

• SSU Geology faculty publish with the largest university press in the world, Oxford University Press, and in top-tier peer reviewed journals in the field of geology.

V. Self-Study Document

A. Program Introduction and History

Introduction

Since our program review in 2009, coordinated by Dr. Dan Karner, the Geology Department has continued to thrive and expand its productive role in the School of Science and Technology (SST). A significant change was the conversion of our previous BA in Geology into a new BA in Earth Science, effective shortly after the last Program Review and not discussed in that Program Review. We now offer a BS in Geology and a BA in Earth Science.

The BS in Geology is intended to give the student professional competence in geology. A calculus-based series of support courses is highly recommended for students intending to pursue a more quantitative geoscience career. It provides an excellent foundation for graduate school or a professional career in the geosciences.

The Earth Science B.A. is designed to provide students with a firm foundation in the geological sciences. A diversity of elective courses allows students interested in related fields to build a supplementary minor. It provides a clear path to graduation and is ideal for students pursuing careers in earth science education, state agencies, environmental geology and hydrogeology.

Changes have inevitably occurred in the department and some highlights of these recent changes include:

1) 100% of the original "founding fathers" of the department have retired.
2) One tenure-track faculty member retired (D. Karner).
3) One tenure-track faculty member left SSU for another tenure-track position (M. Smith).
4) One new tenure-track faculty member was hired in sedimentary geology (O. Anfinson).
5) A new educational support and equipment technician was hired (P. Mooney).

B. Learning Objectives, Goals, Outcomes

1. Learning Goals for Each Academic Program

Bachelor of Science in Geology and Bachelor of Arts in Earth Science

Students who complete the Bachelor of Science in Geology or the Bachelor of Arts in Earth Science degrees at Sonoma State University are required to demonstrate: 1) The understanding of geologic terms, concepts, and theories, 2) The ability to collect geologic data through laboratory and field studies, and to formulate logical interpretations and conclusions from those data, 3) The ability to compare, contrast and demonstrate appreciation of competing views within geology, involving both historical and current controversies, 4) A solid understanding of geologic conditions specific to California and the unique global geological context of California, and 5) The ability to identify common rocks and minerals found in any country located anywhere on Earth. Additionally, students are also expected to acquire the following general skills: 6) Competence in scientific inquiry, 7) critical thinking abilities, 8) written and oral communication proficiency, and 9) quantitative reasoning skills.

2. Rationale for Learning Goals and Outcomes

The goal of the department of geology is to give students professional competence in geology. Common knowledge of the field of geology and the feedback we receive from graduates and prospective employers continually tell us to focus on three areas: 1) Fieldwork, 2) Student Research, and 3) a wide ranging curriculum.

The instructional faculty's philosophy is that the outdoors is an extension of the classroom; it is a laboratory without walls. By going into the field we bring geology back to the classroom. The field is really our outdoor classroom, and we utilize this important resource as often as we can, both locally, regionally, and internationally. Field learning is active learning with a high level of student engagement.

This concept has made our program one of the most field-intensive programs in the CSU system and beyond. Mapping projects and written reports which accompany all field courses hone our students' interpretive and communication skills, preparing them for careers in education, government, research and private industry.

Approximately 1/3 of our graduates immediately pursue graduate degrees, and all obtain positions using their degrees if they choose to do so. Sonoma State University's service area requires a steady supply of new geoscientists to address needs in the areas of education, land use and development, water supply and quality, environmental assessment and remediation, paleontology investigation and review, geologic hazards assessment, geothermal energy research, air quality assessment (toxic mineral dust), plus new challenges associated with climate change (changes in the hydrologic cycle, sea-level rise effects on the Pacific coast and San Francisco Bay and Delta system, plus its levee systems), and a resurgence of interest in mineral and energy resource exploration. These employers need graduates who are ready and able to assume practitioner roles in their disciplines, and to be able to convey effectively their work to other professionals and to laypersons.

The SSU Geology Department continues to receive regular solicitations for our students to apply for jobs from employers within our service area and beyond. Oftentimes these solicitations come from department alumni who have progressed into management positions in their organizations.

We have multiple students getting involved in world-class research projects, and presenting the results at national meetings, such as the Geological Society of America and the American Geophysical Union.

We provide a broad education with our core courses and multiple options for electives. We also provide service to the campus by teaching several large-lecture GE courses.

3. Dissemination of Learning Goals to Students

The following chart documents a wide breadth of learning objectives we strive to teach throughout our curriculum as well as the course that covers that topic. Our course offerings are built to give the student professional competence in geology.

Geology Learning Objectives - by course number

	102	105	107	110	205	303	304	307	309	311	313	317	420
General Skills													
Communicate science clearly and concisely, both written and verbally.	X	X	X	X	X	X	X	X	X	X	X	X	X
Have the basic knowledge and skills demanded for entry-level competence in typical careers in earth science.					X	X	X	X	X	X	X	X	X
Be able to apply basic scientific and technical knowledge to specific tasks and problems.	X	X	X	X	X	X	X	X	X	X	X	X	X
Develop increased capacity in the skills of independent learning, critical thinking, problem definition, and problem solving.	X	X	X	X	X	X	X	X	X	X	X	X	X
Develop enhanced numerical skills and computer literacy as part of an undergraduate program designed to deliver a current and relevant knowledge of their discipline.							X		X			X	X
Communicate effectively and professionally through oral, written, and graphical means and to participate effectively in their workplace and in individual and team-related activities.					X	X	X	X	X	X		X	X
Have the broad general education needed to appreciate the role of Earth Sciences in the societal context and appreciate the importance of ethics in the practice of the profession.	X	X		X	X	X	X	X	X	X	X		X
Geology Basics													
Familiarity with the geologic time scale.	X	X	X	X	X	X	X	X	X	X	X	X	X
Get a sense of geologic time: speed and duration of processes, incompleteness of records, dating	X	X	X	X	X	X	X	X	X		X	X	X

techniques, etc													
Understand the basics of age dating, including current techniques for determing relative and absolute dates					X	X		X		X			X
Understand the basics of plate tectonics	X		X	X		X						X	
Understand and apply fundamentals of stratigraphy, geomorphology and structural geology, relationship to subsurface geology	X		X	X		X	X					X	X
Recognize different types of natural hazards and zonation				X									
Rock. Mineral, and Paleo Identification													
Be familiar with/able to identify basic minerals in hand sample	X		X		X	X	X	X		X		X	X
Be familiar with basic microscope operation					X			X		X			
Be familiar with basic optical mineralogy (using a petrographic microscope, identifying minerals in thin section)					X			X		X			
Have a basic knowledge of different rock types and their tectonic environments	X		X	X	X	X	X	X		X	X	X	X
Recognize basic fossil types		X									X		
Have a basic knowledge of sedimentary rock types and their environments of formation.													
Understand how to read an ancient environment from sedimentary rocks, and have some grasp of facies	X	X	X	X		X	X			X	X	X	X
Field Geology Skills													
Field mapping experience						X	X	X		X	X	X	X
Know how to read a map (understand latitude/longitude, how to interpret basic map keys and symbology)	X		X	X		X	X	X	X		X	X	X

Be practiced in field safety and expectations of behavior when undertaking scientific investigations in the field	X				X	X	X	X		X	X	X	X
Ability to interpret and construct a topographic map.	X		X	X		X	X	X		X	X	X	X
Be able to interpret a geologic map						X	X	X	X	X	X	X	X
Interpret and construct a cross section						X	X	X		X		X	X
Technical Skills													
Be familiar with Excel or another graphing program							X		X			X	X
Remote sensing, types, sources, image processing, applications										X			X
Understand coordinate systems, map datums and projections, GPS						X	X	X	X	X	X	X	X
Familiarity with techniques of primary data collection in the field						X	X	X	X	X	X	X	X
Use of a geologic compass						X	X	X	X		X	X	X
Use standard GIS software (ArcGIS or similar) to display and interpret geographic and geologic data									X				X
Understand the principles of data analysis and statistics.						X				X			X
Ability to locate, use, and manage scientific literature.						X	X	X	X	X	X	X	X
Use standard vector graphics software (Adobe Illustrator or similar) to create figures and maps							X		X			X	X
Know how to access and use public databases that contain geologic data						X	X			X			
Understand simple statistics, including confidence intervals.									X	X			X

4. Structuring of the Curriculum to Reach Expected Outcomes

We recently performed a detailed assessment of core program requirements for a B.S. in Geology. We compared our requirements to those from other similarly-sized geology programs in the CSU, which, because of similar student backgrounds and institutional support, we consider

to be the appropriate programs for comparison. Similar programs in the CSU are found at CSU Dominguez Hills, Cal Poly Pomona, CSU San Bernardino and CSU Stanislaus.

Courses required by all programs (SSU Course numbers shown for reference)

Geology 102: Our Dynamic Earth
Geology 205: Mineralogy
Geology 304: Introduction to Field Mapping and Report Writing
Geology 307: Igneous and Metamorphic Petrology
Geology 411: Sedimentary Geology
Geology 413: Paleontology
Geology 417: Structural Geology
Geology 427: Summer Field Geology
Math 161: Calculus I
Chemistry 115A: Chemistry 1
Physics 114, 116: Physics I (Stanislaus req. = PHYS 210A, 209A)

Additional required courses at SSU:
Geology 303: Advanced Principles of Geology
Geology 308: Igneous and Metamorphic Field Course
Geology 412: Sedimentary Geology Field Course
Geology 418: Structural Geology Field Course
Geology 420: Senior Field Course
Mathematics 211S
Chemistry 115B: Chemistry 2
Physics 214, 216: Physics 2

Additional required courses at 2 or more other campuses, but not SSU (SSU course numbers shown for courses listed in our Catalog)
Geology 309: Computer Applications in Geology (GIS) (2 campuses)
Geology 326: History of Life on Earth (4 campuses)
Geology 323: Hydrology (3 campuses)
Geology 422: Geochemistry (2 campuses)
Plate tectonics (4 campuses)
Water Resources (2 campuses)
Senior Thesis (3 campuses)

Of these comparison campuses, Pomona and San Bernardino operate on the quarter system and Dominguez Hills, Stanislaus, and Sonoma operate on the semester system. The programmatic consequence of operating on the quarter system is that Pomona and San Bernardino are able to include more subjects in their core curriculum, but each subject has fewer instructional hours. From our perspective the differences between quarter and semester instruction helps guide our program's identity: We provide students with in-depth coverage of the fundamentals of geology, recognizing that this requires us to exclude subjects that may be part of the quarter-system curriculum.

5. Documentation of Effective Teaching Strategies for Helping Students Achieve Expected Outcomes

The Geology Department is continually bombarded with anecdotal stories praising our students that choose to attend summer field camps taught by instructors from other universities. These instructors were able to compare our students with those from other institutions who also were taking the field camp course. Time and time again, we are complemented on how our students are prepared and extremely competent in the field compared to students from other universities.

Faculty also reported receiving feedback from members of the community regarding the adequacy of preparation of recent department graduates whom they recently had hired. This was recently demonstrated by the State Water Board hiring a 4th recent SSU Geology graduate.

Here is a further retrospective example of the overall success of the Department of Geology, as evidenced by our alumni who have achieved the Ph.D. degree (a total of 16 alumni) and the subset of those alumni who are now faculty members at institutions around the United States and Canada.

SSU Geology Alumni who are now faculty members
and/or have obtained the Ph.D.
$\sum$ = 16 alumni

N = 9 alumni who are now faculty members.

Tim Cope, SSU B.S. Geology 1998
Ph.D. – Stanford University 2003
Faculty member: Department of Geosciences, DePauw University, Indiana

James G. (Jim) Mills, SSU B.S. Geology 1982
Ph.D. – Michigan State University 1991
Faculty member: Department of Geosciences, DePauw University, Indiana

Bernard Guest, SSU B.S. Geology 1997
Ph.D. – University of California, Los Angeles 2004
Faculty member: Department of Geoscience, University of Calgary

Margaret N. (Peg) Rees, SSU B.S. Geology 1972
Ph.D. – University of Kansas 1984
Faculty member: Department of Geoscience, University of Nevada, Las Vegas

Roland H. Brady III, SSU B.S. Geology 1977
Ph.D. – University of California, Davis 1981
Faculty member: California State University, Fresno

Julie Monet, SSU B.S. Geology 1995

Ed.D. – Rutgers University, 1999
Faculty member: California State University, Chico

Jack Deibert, SSU B.S. Geology 1986,
Ph.D. – University of Wyoming
Faculty member: Austin Peay State University, Clarksville, Tennessee

Tracey Cascadden, SSU B.S. Geology 1987
Ph.D. – University of New Mexico 1997
Faculty member at Emporia State University, Kansas

Nancy Buening, SSU B.S. Geology 1988
Ph.D. – University of California, Davis 1997
Faculty member at Sacramento State University

Additional SSU Geology Alumni who have received the Ph.D.
N = 7 additional alumni with the Ph.D. degree

Julie Calkins, SSU B.S. Geology 2003
Ph.D. – University of York, England 2012

Kristen Jacob, SSU B.S. Geology 2007
Ph.D. – University of Colorado, Boulder 2013

Peter Druschke, SSU B.S. Geology 1999
Ph.D. – University of Nevada, Las Vegas 2009
Senior Petroleum Geologist at ExxonMobil

Scott Strathouse, SSU B.S. Geology 1974
Ph.D. – University of California, Riverside 1978

Craig Cheevers, SSU B.S. Geology 1974
Ph.D. – University of California, Riverside 1978

Steve Edelman, SSU B.S. Geology 1976
Ph.D. – University of California, Davis 1980

Margaret Klute, SSU B.S. Geology 1979
Ph.D. – University of Arizona 1983

Total alumni with the Ph.D. degree = 16

6. **If applicable, departmental involvement in distance and distributed education courses, including their evaluation.**

Not applicable

7. If applicable, description of cross-departmental courses and how these serve majors from other departments

The department offers numerous cross-departmental courses to serve majors from other departments, mainly Anthropology, Geography, and Environmental Studies and Planning. These courses complement other majors, and give students an introduction to topics involved in environmental aspects of geology. Their relevance to environmental topics is fairly self-explanatory based on the title of the course.

GEOL 303: Advanced Principles of Geology
GEOL 309: Computer Applications in Geology
GEOL 306: Environmental Geology
GEOL 311: Sedimentary Geology

8. If applicable, description of GE courses and how these meet the GE area criteria

The Geology Department offers 4 courses (listed below) that satisfy general education categories B1 and B3. These classes are extremely popular (class size > 100 students) and are highly regarded by the students who take them. The interdisciplinary nature of Geology, even at the introductory level, exposes students to the disciplines of chemistry, mathematics, physics, biology, astronomy, geography, and meteorology. Consequently, we consider the GE courses offered by Geology to be ideal vehicles by which the student body at SSU can receive a broad exposure to physical and life sciences. These general education courses help 800-1000 students per year progress toward completion of the general education requirements.

GEOL 102: Our Dynamic Earth: Introduction to Geology (3)
Lecture, 2 hours; laboratory, 3 hours. A study of the minerals, rocks, and landforms that make up our earth in the context of the dynamic forces that form them. Emphasis on local geology, including earthquakes and other environmental aspects. Laboratory study of minerals, rocks, and maps. Required one-day weekend field trip. Fee required. Satisfies GE Area B1 (Physical Sciences) and GE laboratory requirements.

GEOL 105: The Age of Dinosaurs (3)
Lecture, 3 hours. The life and death of dinosaurs as evidenced by the fossil record will be studied to show how geology and biology combine in the discipline of paleontology. The evolution of dinosaurs over a 150-million- year time span sets the stage to investigate several interesting and ongoing controversies surrounding dinosaurs, including: why dinosaurs became extinct, the metabolism of dinosaurs, and the relationship between birds and dinosaurs. Satisfies GE Area B1 (Physical Sciences).

GEOL 110: Natural Disasters (3)

A course to examine the interaction between natural processes and human activities, and the often costly and fatal results. Course emphasis will be on the principles underlying natural disasters such as earthquakes, volcanic eruptions, landslides, floods, severe weather, coastal processes, asteroid impacts, fires, great dyings, and population growth. Many examples will be drawn from the northern California area. Extensive Internet work for current information. Course content may vary with instructor. Satisfies GE, category B3 (Physical Sciences, Specific Emphasis).

GEOL 301: Natural History of the Hawaiian Islands (3)
Lecture, 3 hours. The origin and evolution of the flora and fauna of the most isolated archipelago in the world; geologic history and context of volcanic oceanic islands; conservation biology efforts to save the rare and endangered species of Hawaii. Satisfies GE Are B3 (Specific Emphasis in Natural Sciences).

C. Diversity

The Geology Department has not yet developed a Diversity Policy; currently we rely on the Diversity Policy of SSU. The Geology Department's permanent, tenure-track faculty consists of three males. Female instructors have regularly filled part-time teaching positions. With respect to faculty hires, the department hiring committees have been encouraged, but not forced, by Administration to place added emphasis on diversity when making hiring decisions. Final hiring decisions have been made based on recommendations based on applicant qualifications and suitability to the department based on teaching experience and areas of research expertise.

The Geology faculty members are aware that significant effort must be made to increase the diversity of our program, and the best way that we will be able to accomplish that goal is to hire a tenure-track faculty member who is a racial minority or a woman, or both. We will consider this when hiring our next tenure track candidate.

During the Fall 2015 semester, below is a table of the ethnic/racial self-identifiers of the majors and minors in the Department of Geology:

Ethnic/Racial Identifiers of Geology Majors and Minors in Fall 2015	**Number of Students (% of total)**
White	42 (54%)
Hispanic	16 (20.5%)
2 or more	8 (10.3%)
Asian	5 (6.4%)
Decline to state	4 (5.1%)
Black	2 (2.6%)
American Indian	1 (1.3%)
Total	**78**

D. Student Body

Our student faculty ratio is higher than that of other CSUs over the last 10 years. We have an average of 31.6 compared to 22.7 for all other campuses. (Geology Fall 2014 SFR = 43.3). Our average class size is larger than that of other CSUs. Average of (35.5 to 31.3 students).

Enrollment Data

Count of ID	Acad Plan					
Term	EARTH-BA	GEOL-BA	GEOL-BS	GEOL-MIN	PALEO-MIN	Grand Total
Fall 2005		9	18	4	2	33
Spring 2006	1	10	23	7	4	45
Fall 2006	1	10	28	7	8	54
Spring 2007	1	10	30	7	9	57
Fall 2007	7	7	32	12	17	75
Spring 2008	7	8	27	12	17	71
Fall 2008	9	4	27	7	20	67
Spring 2009	9	5	30	7	21	72
Fall 2009	10	1	36	7	26	80
Fall 2010	19		38	7	39	103
Spring 2011	19		36	6	36	97
Fall 2011	34		43	7	44	128
Spring 2012	37	1	40	7	37	122
Fall 2012	42	1	52	12	39	146
Spring 2013	40	1	49	11	38	139
Fall 2013	30		56	10	37	133
Spring 2014	28		59	10	38	135
Fall 2014	31		58	8	36	133
Spring 2015	30		57	8	34	129
Fall 2015	21		46	7	24	98
Grand Total	376	67	785	163	526	1917

Our number of majors grew dramatically from 2006 to a peak in 2012. It stayed near the 2012 peak until this year (2015), where our enrollment has dropped. We continue to take active steps to maintain our numbers of majors.

Graduation Data

Count of ID	Acad Plan					
Term	EARTH-BA	GEOL-BA	GEOL-BS	GEOL-MIN	PALEO-MIN	Grand Total
Fall 2005			3			3
Spring 2006			1	1	2	4
Fall 2006			1	5	1	7
Spring 2007				1		1
Fall 2007				7		7
Spring 2008					3	3
Fall 2008					1	1
Spring 2009					2	3 5
Fall 2009				1		1 2
Spring 2010			1		1	2
Fall 2010			2	2	2	2 8
Spring 2011				3		2 5
Fall 2011	1			3		6 10
Spring 2012	1			3	1	4 9
Fall 2012			1	3		1 5
Spring 2013	5					2 7
Fall 2013	1			1	1	1 4
Spring 2014	4				2	2 8
Fall 2014	2			5		3 10
Spring 2015	7			3	2	4 16
Grand Total	21	9	38	18	31	117

Professor Matt James takes the lead on academic advising within the department. He meets with each student individually to plot out their academic workload. Additionally, twice a year the faculty has an advising lunch, complete with pizza to attract a greater number of students, where we discuss advising for the upcoming semester.

E. Faculty

The Geology Department consisted of five permanent tenured and tenure-track faculty from 1972-2002. During that 30-year period, only one faculty position turned over (in 1986 with the death of a faculty member). Since then, all of the original "founding fathers" of the department have retired. A more recent tenure-track faculty member retired (D. Karner) and another tenure-track faculty member left SSU for another tenure-track position (M. Smith). In 2014, the department was reduced to two fulltime permanent faculty members.

This semester, we gained a new tenure-track faculty member who specializes in sedimentary geology (O. Anfinson). We have also hired a new educational support and equipment technician (P. Mooney). Our large pool of talented and reliable temporary lecturers has been able to step in and cover courses when necessary. These part-time lecturers teach many of the introductory courses.

Pedagogy

The goal of the department of geology is to give students professional competence in geology. Rather than distribute our curriculum to cover every potential topic, we concentrate our resources to focus on in-depth coverage of the fundamentals of geology. Students take a fundamental curriculum that concentrates on the analysis of rocks and minerals, earth surface processes, earth history and evolution, geophysical and GIS analysis, structural deformation, and geologic mapping. The curriculum emphasizes field-based observation and inquiry

The instructional faculty's philosophy is that the outdoors is an extension of the classroom; it is a laboratory without walls. By going into the field we bring geology back to the classroom. The field is really our outdoor classroom, and we utilize this important resource as often as we can, both locally, regionally, and internationally. Field learning is active learning with a high level of student engagement.

This concept has made our program one of the most field-intensive programs in the CSU system and beyond. Mapping projects and written reports which accompany all field courses hone our students' interpretive and communication skills, preparing them for careers in education, government, research and private industry.

Innovation in Field Teaching

Matthew James in collaboration with SSU Emeritus Professor Thomas Anderson has continued his international field trip with geology majors to the UNESCO Burgess Shale Fossil Deposits in British Columbia, Canada. They will present at the annual meeting of the Geological

Society of America in Denver, Colorado in October 2013 in a symposium on "Great Field Trips."

Participation

The Geology faculty serve on multiple committees campus-wide, including the GE Committee (Smith) and the Academic Senate (Mookerjee, James). Matthew James served on the Search Committee for the Dean of the School of Science and Technology, committee chaired by Provost Andrew Rogerson, Spring 2012. Michael Smith spent three years as the Chair of the General Education Subcommittee of the SSU Academic Senate. Michael Smith serveed on the SSU Copeland Creek Committee. Matty Mookerjee is the SST representative on the Faculty Subcommittee on Sponsored Programs of the Academic Senate. Matty Mookerjee finished a full three-year elected term as Senator on the SSU Academic Senate at the end of AY 2012-13. Matthew James served as a representative of the School of Science and Technology on the campus-wide committee to reevaluate the rental vehicle contract with Enterprise Rent-A-Car. Matthew James serves on the School of Science and Technology Professional Development Committee. Matthew James serves on the School of Science and Technology Curriculum Committee. Michael Smith was a member School of Science and Technology Radiation Safety Committee.

Our faculty actively participate in the great geology community external to campus. Matthew James served as the external reviewer for the Department of Earth and Environmental Sciences at California State University, East Bay in April 2013.Matthew James continues to represent Sonoma State University as a lifetime Fellow of the California Academy of Sciences, San Francisco, California. Matthew James co-organized and co-lead a day-long field trip across Sonoma County for the Fall 2013 meeting of the American Association of Geology Teachers (NAGT) Far Western Division, in conjunction with Rebecca Perlroth from the Department of Earth Sciences at Santa Rosa Junior College. Matthew James was elected Chair for 2013 of the Board of Heads and Chairs of the American Geophysical Union (AGU), which meets every December at the annual meeting in San Francisco, California. Matthew James continues to serve as an elected member of the Executive Committee and Council of the Pacific Division, American Association for the Advancement of Science (AAAS-PD) and attends Executive Committee meetings in November of each year and the annual meeting of AAAS-PD each June. Matthew James attended the annual meeting of the American Association for the Advancement of Science, Pacific Division in Boise, Idaho in June 2012, and in Las Vegas, Nevada in June 2013. Matty Mookerjee served as a participant on the California Geological Survey's (CGS) Tsunami Response Efforts Northern Bay Area Regional Workshop, Summer 2012. Matthew James has been asked by the organization The Friends of the Falls of Clyde to lend his knowledge of maritime history to the ongoing efforts in Honolulu, Hawaii Falls of Clyde built in 1878 in Port Glasgow, Inverclyde, Scotland. The Falls of Clyde was designated a U.S. National Historic Landmark in 1989. Matthew James was inducted in the Zeta Tau Chapter of Phi Beta Delta, the honor society for international scholars at Sonoma State University. Matty Mookerjee, Michael Smith, and Matthew James coordinated a collaborative research agreement between the Department of Geology and Great Bear Petroleum for thin-section and microscopic analysis of rock cores from Alaska. Matthew James continues represent Sonoma State University as he

serves an elected three year term as a member of the General Assembly of the Charles Darwin Foundation, headquartered at the Charles Darwin Research Station in the Galápagos Islands.

Professional Contributions

The following list documents the professional contributions and accomplishments of the faculty over the last 5 years. This is supplemented by the many stories about the Geology Department attached at the end of this document.

Highlights

1. Two new National Science Foundation grants with Department of Geology faculty as Principal Investigators are expected to bring approximately $385,320 to Sonoma State University.
2. The geology tenure-track and part-time faculty continue to be highly productive by publishing in high-quality journals and by giving professional presentation on the results of their scholarly research to colleagues around California and across the county.
3. The geology faculty are active in numerous levels of service from the Department level to the School of Science and Technology level and to the University level.
4. Professor Matthew James has signed a book contract with Oxford University Press for hardcover and softcover editions of: *Collecting Evolution: The Untold Story of the Vindication of Charles Darwin by the 1905-1906 Galápagos Expedition of the California Academy of Science*s, due out in 2014.

Publications

James, M.J. 2012. The boat, the bay and the museum: Significance of the 1905-1906 Galápagos expedition of the California Academy of Sciences. In: *The Role of Science for Conservation*, edited by M. Wolff and M. Gardener, pp. 87-99. London: Routledge, xviii + 299 pp.

Bero, D.A. 2013. Geology of Ring Mountain and Tiburon Peninsula, Marin County, California. Abstracts presented at the meeting of the Cordilleran Section of the Geological Society of America and associated societies. Fresno, California, 20–22 May 2013, pp. 69-70.

Aswasereelert, W., Meyers, S.R., Carroll, A.R., Peters, S.E., Smith, M.E., and Feigl, K.L. 2012. Integrated Macrostratigraphy and Cyclostratigraphy of Eocene Lacustrine Strata, Wilkins Peak Member of the Green River Formation, Wyoming. Geological Society of America Bulletin 125(1-2): 216-228.

Presentations

Matthew James and Thomas Anderson,
Active Learning Undergraduate Field Trip to the Burgess Shale, British Columbia, Canada, Geological Society of America Annual Meeting, Denver, Coloradao, October

28, 2013.

Matthew James, spoke multiple times on the historical and enduring significance of the 1905-06 Galápagos expedition of the California Academy of Sciences, including: On the birthday of Charles Darwin to the Bay Area Biosystematists, University of
California, Berkeley, February 12, 2013.

Friends of the 1878, 280-foot, four-masted tall ship FALLS OF CLYDE, dockside in Honolulu Harbor, Honolulu, Hawaii, July 25, 2012.

Matthew James delivered the invited 2012 Peter Leveque Natural History Lecture, a once-a-year event at Santa Rosa Junior College, Santa Rosa, California. Oakmont Sunday Symposium, Oakmont, California, February 19, 2012.

Matty Mookerjee.
San Jose State University (Fall, 2012) and Stanford University (Spring, 2012). Three-dimensional strain analysis using Mathematica. Structural Geology and Tectonics Forum Program with Abstracts, 2012, p. 46.

David Bero
Geology of Ring Mountain and Tiburon Peninsula, Marin County, California, May 21, 2013, Geological Society of America, Cordilleran Section, Fresno, California.

Michael Smith
Using stream sediment lithology to explore the roles of abrasion and channel network structure in shaping downstream sediment yields, American Geophysical Union Annual Meeting, San Francisco, with Erich R. Mueller; Michael E. Smith; John Pitlick.

Rolfe Erickson
Emeritus Professor Erickson presented an evening lecture on his research on the tektite strewn field in northern California to the National Association of Geology Teachers (NAGT) Far Western annual meeting held at Santa Rosa Junior College in August 2013.

New Funding
Collaborative Research: Paleogeographic Record of Contractional to Extensional Tectonics in the Cordilleran Hinterland, Nevada ($86,000). National Science Foundation, PI Michael Smith, funding recommendation from NSF Program Director.

NSF-RCN: EC3 – Earth-Centered Communication for Cyberinfrastructure: Challenges of field data collection, management, and integration. PI: Matty Mookerjee. Spring, 2013. Funding Pending ($299,320) while budget is being revised.

Professional Development

Matty Mookerjee attended the Structural Geology and Tectonics Forum in Summer 2012 at Williams College in Williamstown, Massachusetts.

Matthew James attended the annual meeting of the History of Science Society in San Diego, California in November 2012, in particular to speak with university presses.

Matthew James attended the 2013 Darwin Day symposium at Stanford University.

Matthew James attended and actively participated in the Heads and Chairs Meeting at the American Geophysical Union annual meeting in San Francisco, December 2012, 2013.

Collaborations

Michael Smith continued his collaboration at the Bodega Marine Laboratory of the University of California at the Bodega Marine Reserve on aolian transport as part of a service learning project from 2010 to the present.

Matty Mookerjee co-taught short course with Professor Fred Vollmer of SUNY New Paltz on computer Strain Programs used in structural geology, Summer 2012, at Williams College in Williamstown, Massachusetts.

Matty Mookerjee served as co-chair with Steve Wojtal from Oberlin College in Oberlin, Ohio, on the subject of Quantifying Strain and Strain Rates at the Structural Geology and Tectonics Forum, Summer 2012, at Williams College in Williamstown, Massachusetts.

Matthew James collaborated with Rebecca Perlroth of the Earth and Space Sciences Department at Santa Rosa Junior College on the field trip guide book for the 2013 Fall meeting of the Far Western Section of the National Association of Geology Teachers (NAGT).

Martha Murphy is a member of the Science Education Resource Center (SERC) with the National Association of Geoscience Teachers headquartered out of Carleton College in Northfield, Minnesota.

Thomas Anderson and Nicole Meyers are co-leading a field trip to the Point Reyes National Seashore for Rebecca Perlroth of Santa Rosa Junior College for the annual meeting of the National Association of Geology Teachers (NAGT) Far Western Section, August 2013.

F. Institutional Support and Resources

Support for Student Learning Objectives

The Library is used by Geology Faculty to manage digital media (DVDs) shown in courses that must then be made available to students for further viewing. They also hold course textbooks on reserve for our students to access. The Library has provided on-line

access to scientific journals that enable our faculty and students to keep abreast of scholarly work in their fields of research and interests. Additionally, the Geology Faculty relies on Reference Librarians to help instruct students how to perform literature searches associated with their research reports. We are very happy of the support we have received from the library over the last few years.

Computer Technology and IT support services are satisfactory for the work in the Geology Department. IT has done a wonderful job setting up a Geology computer lab with 14 computers in Darwin 23. These computers are used to teach Geology 309: Computer Application in Geology. Additionally, students are able to use this lab to work on their projects and reports.

Student Support Services, particularly Disabled Student Services, are an essential part of the Geology Department being able to handle its GE enrollment and instruction. We rely on DSS to provide space and proctoring services for 5-20 students per semester.

Faculty Development and Support is used primarily for financial support to attend professional conferences, and personnel training regarding student management, including confidentiality and harassment issues.

Adequacy of Facilities and Resources

The Geology department facilities are adequate for our present majors and minors student base and our three member faculty. We have space for teaching and research.

Our financial resources are adequate for the current operation of the department. It is important to keep in mind that we are fully and totally dependent on the Provost's augmentation to continue running the department. We continually push for additional revenue streams from donors to supplement our normal budget, and we had a multi-year working relationship with Great Bear that added nearly $25,000 that helps to fund research. Additionally, the Woodard Scholarship is the largest endowed scholarship on campus.

The help received from HR has been adequate for our department.

G. Assessment & Findings

Interim Program Assessment

The Interim Program Review, conducted by now-retired faculty, indicated that no exit questionnaires were given to graduating seniors. Feedback from alumni was obtained through unsolicited verbal feedback provided in informal settings.

We recognize that developing exit questionnaires and alumni surveys are important means by which to obtain quantifiable feedback about our program. We will develop these surveys and begin to give them to our graduating students.

Analysis of the Education Effectiveness of the Program

As mentioned above, surveys were not completed for this review. However, we have collected verbal feedback on multiple occasions. Faculty reported receiving feedback from members of the community regarding the adequacy of preparation of recent department graduates whom they recently had hired. Additional feedback was obtained from other institutions' instructors who taught our students in Summer Field camps. These instructors were able to compare our students with those from other institutions who also were taking the field camp course. These sources of feedback all are important and generally have provided favorable reviews of the Geology Department's program.

Changes to Improve Effectiveness

To improve the effectiveness of the program, we have developed an Action Plan, described below. The Action Plan will focus on three areas: 1) increasing diversity, 2) utilizing part-time lecturers and staff in more diverse roles, and 3) reviewing our curriculum and adding electives. This plan is explained in detail below.

Dissemination of Findings

The findings of Dr. Shapiro's review were given to all faculty and staff to read. The department reviewed and discussed these findings in detail during our weekly department meetings. This inspired lively discussions and led to our Action Plan, described below.

H. Action Plan

We have listed three items to concentrate on for the next several years based on the recommendations of Dr Russel Shapiro and discussions within the department. The action items are shown in bold below, followed by our strategy to implement those items.

1) Increase Diversity.

Develop and implement a strategy to increase the diversity of the Geology Department Faculty and program majors. This will involve the development of a Geology Department Diversity Policy Statement and the appraisal of our curriculum content to determine whether it might be altered to increase interest from a broader audience. Additionally, we will consider the role of diversity when searching for a 4th tenure track candidate.

2) Utilize the Part-time Lecturers and Staff in More Diverse Roles.

Dr. Russell Shapiro writes, "Part-time lectures can take on advising roles through WTU credit with the administration. There is a strong desire from the current students to be engaged in research projects with faculty members. There is CSU precedent for part-time faculty to receive

one or more WTU for advising, equivalent to the 1/3 WTU currently received by tenure-track faculty per undergraduate research student. This new interaction would not only benefit the students but would enable part-time faculty to build up their own careers while simultaneously expanding the breadth of expertise of the geology department. Similarly, the department technician, Philip Mooney, is an accomplished research geologist with a strong rapport with the students. Perhaps there is a mechanism to shift some of his time toward mentoring students?"

We will continue discussions with our part-time lectures to expand their roles within the department, and consider asking them to support research opportunities. Additionally, the department technician, Philip Mooney, has recently been approved for a classification shift which opens up many possible options to utilize him in mentoring students.

3) Review Curriculum and Add Additional Electives

One of the aspects of electives that Dr. Russell Shapiro mentioned in his external review is that by having, at the time he was writing, only two tenure-track faculty, James and Mookerjee (with the imminent departure of Mike Smith), one of whom serves as Chair, that is was difficult to offer diverse major electives.

Dr Russell Shapiro writes, "The diverse expertise of the geological community in the Sonoma State service area in the North Bay Area allows the potential to develop new applied and 'professional career' electives. The students were vocal in their desire for courses in environmental monitoring and hydrology (or hydrogeology), in keeping with the frequent employment of department graduates in the fields of engineering geology, hydrology, environmental geology."

To address this, we will solicit recommendations from our faculty to offer more diverse courses. In fact, we have already begun this process and have the following courses in mind.

- Martha Murphy: Geology 215 - Global Climate Change - offered on an experimental basis in Spring 2016, will count as 3 units of elective for both BA and BS majors via the Major/Minor Course Substitution form. Has 25 department majors in BA/BS enrolled at this time.
- Owen Anfinson: Geology 320 – Basin Analysis with plans to offer a new course in Global Tectonics.
- David Bero: Introductory Geochemistry and/or an Ore Deposits. Introductory geochemistry curse with an emphasis on igneous and metamorphic rocks which could be taken during the Fall semester in preparation for Igneous and Metamorphic Petrology (GEOL 307) in the spring.
- Tom Williams: Geology 323 – Hydrology in addition to developing a new course, Environmental Geology.
- Nicole Meyers: Develop a new course, The Geology of the National Parks.
- Jim Joyce: Develop a new course, Engineering Geology.

Geology in the News

The following pages include various articles concerning the Geology Department at SSU that have appeared in the news over the last 5 years. These articles support the tenor and content of the scholarly work of both the tenure-track and part-time faculty.

A Wonderful Hike: SSU Geology Studies Cambrian Life in the Canadian Rockies.
By Phil Mooney, Geology Technician
Published version: http://www.sonoma.edu/insights/

Twelve hearty souls from the SSU Department of Geology recently embarked on a 6-day field trip to the Canadian Rockies in British Columbia and Alberta. The focus of the trip was a visit to the world-renown Burgess Shale, a UNESCO world heritage site widely lauded as the most important fossil locality in the world. This field trip ran in conjunction with the upper level Geology elective course, GEOL321: Burgess Shale Paleontology, a class taught by the Department of Geology's paleontologist Matt James since 2003.

The fossils of Burgess Shale were discovered in 1909 during construction of the Trans-Canadian Railway. These 505 million year old fossils, remnants of creatures that once lived in a shallow sea, are the best record of the period of time after the appearance of modern hard-shelled multicellular animals and have proved pivotal to the study of Paleontology. They are located in the majestic Canadian Rockies on the eastern border of British Columbia, surrounded by stunningly beautiful mountains shaped by numerous glaciers. In short, a geologist's heaven!

After a day of travel to their home base in Field, British Columbia, the first full day in the field was spent traversing the massive Athabasca Glacier with a mountaineering guide. The Athabasca Glacier is a 6 km long sheet of blue-green ice that slowly cascades down a valley that is connected to the Columbia Icefield, transporting massive sediment loads as it travels nearly 30 meters a year. On an all-day six mile hike up the glacier, students learned about glaciology, saw fantastic examples of a landscape carved by glaciers, and witnessed firsthand the effects of climate change as the ice retreated up the valley.

Next on the agenda were two days exploring the world famous Burgess Shale on guided hikes to the Walcott Quarry and the Mt. Stephen Trilobite Beds. A strenuous 13 mile hike, starting at a waterfall, heading uphill through beautiful forests, and traversing a mountain with stunning alpine scenery brought students to the most important of fossil sites, the historic Walcott Quarry where the Burgess Shale fossils were first discovered. Along the way students learned of exotic Cambrian animals such as the fearsome *Anomalocaris*, the five-eyed *Opabinia*, and the otherworldly *Hallucigenia*. The next day was a steep 5-mile hike up Mt Stephen where there were so many trilobite fossils that you couldn't help but step on them! At both of these sites, students were rewarded for their physical effort with amazing fossil finds and breathtaking views of the surrounding mountains.

The last full day of the trip brought students into the world of mountains, faults, and glaciers with a hike around the gem of the Canadian Rockies, Lake Louise. A six mile hike brought students to a fantastic lunch at the Plain of Six Glaciers Tea Hut, a charming, historic, and primitive restaurant only accessible by foot. With bellies full of tea and hot scones, the intrepid geologists continued up the valley to a scenic overlook and discussion of the tectonic formation of western North America. With weary legs, the group hiked down and enjoyed a wonderful sendoff dinner, sampling meat from the characteristic terrestrial megafauna of a North America (Buffalo, Caribou, Elk, etc.) at the Emerald Lake Lodge.

The sixth day was a day for travel, but along the way students were treated to a private tour of the Royal Tyrell Museum of Paleontology in Drumheller, Alberta. With an all-access behind the scenes tour by a resident paleontologist, they learned about all the hard work that goes into the preservation of fossils, explored the back room archives, and enjoyed a private tour of the main exhibits of the museum.

With 30+ miles of hiking packed into four full days, students traveled back to campus tired, in markedly better shape than when they began, and with a renewed vigor to continue their geologic education at SSU. There is no substitute for fieldwork and hands-on learning in the natural classroom of the Earth. Students had a great time on this trip, were exposed to beautiful and world-famous geology, and made memories to last a lifetime.

Sonoma State University geology majors with their professor, Dr. Matthew James (with white hat), and their mountaineering guide (in yellow jacket, with trusty companion) on the Athabasca Glacier in Jasper National Park, Alberta, Canada, in September 2014.

SSU Geology Professor Publishes Geologic Maps of Southern Marin County, CA

Geologic maps of Ring Mountain and the Tiburon Peninsula by David Bero of Sonoma State University are the culmination of nearly 20 years of geologic fieldwork.

By Phil Mooney, Geology Technician

Source: www.sonoma.edu/scitech/newsletter/newsletter_sp15.pdf

Geologists around the world are known for their love of the outdoors. Professor David Bero, who has been lecturing in the Department of Geology at SSU for the last 8 years, is no exception. He has spent nearly every weekend during the last 20 years hiking the trails and enjoying the sweeping vistas of Marin County, CA. What distinguishes him from the multitude of people recreating on the same land is his intense focus on the rocks beneath him. David doesn't just go out for hikes and wander aimlessly along the trails. His mind is active, his practiced eye notices small details, and he routinely stops to examine rocks with a small magnifying glass. In short, he's out conducting geologic field work.

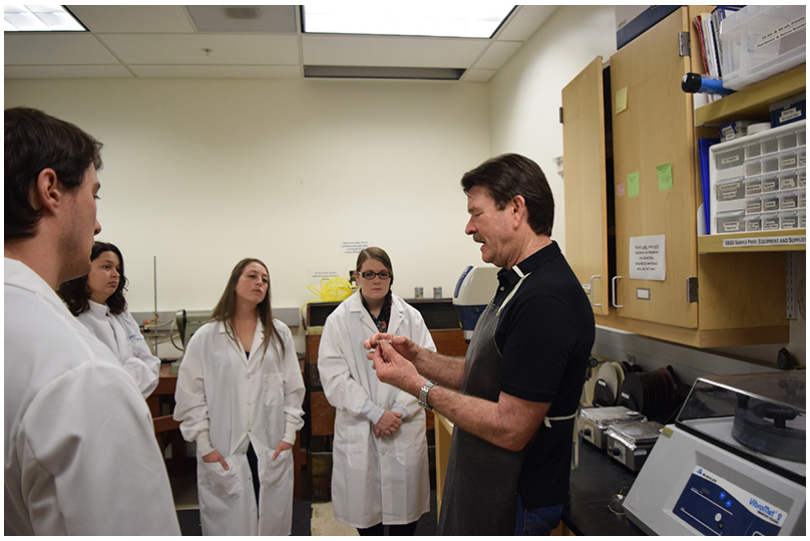
"I have lived and worked in the Bay Area for much of my career," says David, a resident of southern Marin. "Not all geologists are fortunate enough to have world-class geologic localities right out their front door. I have always been drawn to the beauty of Marin County and the rocks of the Franciscan Complex underlying the area. That combination has kept my interest and has remained my research focus for over two decades."

The rocks of the Franciscan Complex that David speaks of compose the remnants of an ancient subduction zone, which is the type of plate boundary where oceanic crustal rocks are pushed down to great depths beneath a continent, in this case the North American Continent. During this process, the rocks that David studies were altered (metamorphosed) by increasing heat and pressure and later moved back toward the surface along a series of complex faults. Sometimes during this process, rare and very ancient rocks composed of unusual minerals, called high-grade metamorphic blocks, are found associated with these previously subducted rocks. "The unique thing about Ring Mountain is the concentration and variety of the high-grade metamorphic blocks that occur there," says David. "The variety of temperature and pressure conditions recorded by these metamorphic blocks has made this area a key laboratory for a better understanding of the subduction process."

Over the years various geologists have worked on a number of projects attempting to sort out the geologic details of Ring Mountain and Tiburon Peninsula area; David is one of them. "I've spent many days out there during the past 20 years mapping and trying to sort out the variety of rock types and multiple fault offsets that have occurred there which represent about 160 million years of local earth history. I hope that these geologic maps and accompanying report will be useful for those in the geologic community considering, or actively involved in research in the area, as well as those teaching or leading field trips in one of the classic area of the Franciscan Complex."

Professor Bero's geologic maps of both Ring Mountain and the Tiburon Peninsula, as well as a detailed report on the geology and structure of the area, Map Sheet 62, can be purchased on the California Geological Survey's website:

http://www.consrv.ca.gov/cgs/information/publications/release_statements/Documents/MS_62_release_statement.pdf



David Bero teaches a group of geology students how to make rocks thin enough for use under a microscope in a recent class.
(Photo by Nicolas Grizzle, University Affairs, News and Information Coordinator)

Departmental Update from 2010
From Departmental Newsletter GeoLog

Greetings geology alumni, students, and friends of SSU Geology,

We are thriving in the fully renovated Darwin Hall, now with offices on the first floor, and with classrooms and labs on both the first floor and the basement. No more running from the third floor to the basement and back multiple times a day, as many of you remember! The biggest change has been the retirement of all the original faculty members, "the Founding Fathers" as we fondly refer to them. Rolfe lives locally in Cotati (we see him nearly every day), Terry splits his time between Forestville and Benton down near Bishop in the Owens Valley (still doing much geologizing and skiing), Tom lives in Reno (and still joins me on field trips to Canada and Nevada), and Walt lives in Sebastopol and this semester is finishing his early retirement with a last round of Ig Met and Senior Field.

The department is now a group of four full-time faculty, who you'll hear from in this newsletter: Dan Karner, Matty Mookerjee, Mike Smith, and myself. With help from occasional part-time faculty (who sometimes include SSU geology alumni), we cover all the traditional bases of the curriculum, with slight modifications and innovations to stay current. We are working to hire a 5th full-time faculty member in the near future, bringing up back up to the five faculty level so many of you remember from your days here as students. Our departmental technician is Sue Nosker (SSU geology alum in 1976) and we have valuable help from John Collins in the machine shop in the basement. Together, we get everything done from thin sections to teaching to field trip cooking.

As always, we have really good majors who care deeply about geology, and I'm impressed how year after year we get such good people in our program either through junior transfers or who start here as freshmen. It remains true that the Geology Department is more like a family that learns and travels together than just an academic department.

One of my underlying goals during the time I've been chair is to strengthen and expand our field program, a traditional strength of our department. The field classes for the majors core courses are very much intact, including 304, Ig Met, Sed Pet, Structure, and Senior Field, and recently we added Paleo field to the required list. Students still head off to summer field camp the summer after they "graduate," finishing in reality at the end of August. As an elective field course in 2003 I started an international trip to the Burgess Shale fossil deposits in British Columbia, which Tom Anderson has assisted with each year with SSU students. As budget allows, I brought back the Death Valley class for non-majors over Spring Break, and we hope to run it again in Spring 2011.

Sometimes you get an itch to visit places you've heard of over the years, and that's what I did with a big road trip of SSU geology majors to Arizona in Fall 2008 to visit Meteor Crater, Petrified Forest National Park, and to hike down into the Grand Canyon. And there was a similar motivation to visit the House Range in western Utah with Tom Anderson in Spring 2007. Various courses also have me taking students to Shasta Lake in the eastern Klamath Mountains (though haven't gone in a couple of years), the southern Nopah Range for mapping and trilobites, the Marble Mountains and the Granite Mountains in the Mojave National Preserve, and all over Nevada for fossil fish, ichthyosaurs, archaeocyatha, and, of course, trilobites. To encourage more interest in all SSU students, I started a Minor in Paleontology two years ago and it is proving to be quite popular. Did I mention trilobites?

Various semesters you'll find me teaching Dinosaurs, Intro to Geologic Mapping, Natural History of the Hawaiian Islands, and/or Paleontology, always with a plan in mind for the next field trip to

When not teaching or doing department business, I have a writing project all about the 1905-06 Galapagos expedition of the California of Sciences (have traveled there 11 times), and I have given talks on this topic all over northern California, including once to a "captive audience" at San Quentin. This involved walking unprotected across the exercise yard and a basketball court to reach a classroom, saying "Excuse me, excuse me, hey, how's it goin'? Excuse me, how's it goin'?" Suffice it to say I did not get shanked and came away with many stories to tell.

My goals as department chair have been to maintain the traditions of our department, while realizing change can be good in the curriculum to meet the needs of our majors as they go on to work or to graduate school. I look forward to hearing from our alumni any time, either by stopping by the department or even on Facebook!

Kind regards,

Matt James
Department Chair

SSU Professor's History of Cal Academy Voyage to Further Darwin's Work Wins Maritime History Award

ABOVE, California Academy of Sciences' schooner crew were eight young men who traveled to pursue Darwin's work in the Galapagos Islands. BELOW, "Academy" in June 1905. (Photos courtesy of California Academy of Sciences Archive.)

The trials and triumphs of a 1905 ocean expedition comes to life in Professor Matthew James' story of the eight young scientists who helped further Charles Darwin's work on evolutionary theory by sailing to the Galapagos Islands and collecting specimens for the California Academy of Sciences.

James, a Sonoma State University geology professor, uses evocative imagery to take the reader back to the world of early 20th century natural science in such a unique way that he has been honored by the Friends of the San Francisco Maritime Museum Library with the 2011 Karl Kortum Award for Maritime History.

By collecting some 78,000 specimens at a crucial time when conservation and preservation concerns were growing all over the world, the expedition essentially brought the Galapagos to San Francisco, says James.

The enduring legacy of the 1905-06 scientific expedition rests with both the destruction of the California Academy of Sciences in the April 1906 earthquake and fire, and in the vindication of Charles Darwin by the numerous scientific specimens collected during the 17-month expedition. Those specimens are now housed safely at the California Academy of Sciences in Golden Gate Park in San Francisco. They are used extensively by researchers from around the world.

James has also written extensively about the maritime history of the 89-foot schooner "Academy" used in the 1905-06 expedition. It was built in 1875 in Baltimore, Maryland for the U.S. Coast and Geodetic Survey. This sailing vessel shared similarities with HMS Beagle, the ship that Charles Darwin sailed on during his famous voyage that led to his celebrated 1859 book "On the Origin of Species." Both vessels were built for coastal surveying and both were about 90 feet long, although the "Academy" was a schooner and the "Beagle" was a square-rigged barque.

In addition to the surveying work performed for the US Coast and Geodetic Survey, the schooner "Academy" also documented a major El Niño in 1877-78, participated in maritime surveying as far north as Alaska, and was eventually lost to history while on an ill-fated gold hunting expedition to Tierra del Fuego in 1915.

"James' passion and skill for telling stories from historical science brings the past alive for his students," says Lynn Stauffer, Dean of the School of Science and Technology. "The Karl Kortum Award given for his telling of the 1905-06 California Academy of Sciences research expedition to the Galapagos Islands recognizes his effectiveness as a science historian and educator inside and out of the classroom."

The central aim of the Kortum Award is to foster research in selected fields of West Coast maritime history by presenting a $1,000 award biennially. An award ceremony was held on Sunday, June 4 at the J. Porter Shaw Library of the San Francisco Maritime Museum at Fort Mason Center in San Francisco.

James specializes in the Galapagos Islands where he has worked since 1982. His areas of Galapagos expertise include marine invertebrate paleontology, conservation, and human history.

He can be reached by email at james@sonoma.edu.

Historical photos of the Academy's voyage from the archives of the California Academy of Sciences are available upon request. Contact Jean Wasp, Marketing and Media Relations Coordinator, (707) 664-2057.

Posted by Jean Wasp on Monday, June 6, 2011 at 3:17 PM | 0 TrackBacks
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Geology Students Unfold Earth's Natural History in the Sierras

Geologists study the Earth around us, and there is no better way to learn than by actually looking at rocks in the field. It is for this reason Sonoma State University geology students embark regularly on excursions to remote areas, and a group of 17 students just returned from the Southern Sierras where they studied the 500 million-year-old tectonic forces that have shaped California.

"These trips are the foundation of the department," says geology professor Matty Mookerjee. "They introduce students to the remarkable geology that surrounds us all."

The trip started in Yosemite National Park, explored the Mammoth Lakes region then traveled through Long Valley Caldera before ending with a detailed study of the world-famous Poleta Folds in the natural laboratory of Deep Springs Valley.

Working outside on a beautiful day in Yosemite, students identified rock types, practiced primary data collection using their Freiberger compasses and Trimble GPS units, and learned to identify signs of deformation like fractures, folds and faults. In Mammoth Lakes, students measured the orientation of foliations and lineations along the shores of Lake George within the Rosy Finch Shear Zone.

But the biggest project of the trip was a two-day mapping exercise in Poleta Folds, known as a rite of passage in the field of geology. Students from universities across the nation descend upon this small pocket in the desert to study the 500 million-year-old sediments and "unfold" the history the rocks record.

In the evenings, weary students came back to the campground in Westgard Pass to eat and relax around a roaring fire. They exchanged stories about their days in the field and unwound by playing board games on the picnic tables before heading to their tents to sleep under a full moon. Graduates of SSU all share this common experience, and often tell stories of bonding with colleagues while reliving their days spent mapping under the hot desert sun.

"Every trip reminds us that it's about more than just geology," says SSU geology technician Phil Mooney, who participates in many of the department's excursions. "These shared experiences often help to form relationships with friends and colleagues that last a lifetime."

Photo:
Taylor Swain measures the orientation of foliation using a Freiberger geologists compass.
Photo by Phil Mooney

Posted by Nicolas Grizzle on Monday, November 16, 2015 at 8:25 AM
Filed in Homepage

Global Scientific Community Comes Together to Preserve Galapagos

Sonoma State University geology professor Matt James is passionate about the Galapagos Islands' importance to the scientific community. But he's not just telling his students about it--James organized an international symposium to ensure the birthplace of the theory of evolution continues to yield important discoveries for future generations.

The three-day symposium brought researchers and conservationists from around the globe to San Francisco State University and the California Academy of Sciences at the 100th meeting of the American Association for the Advancement of Science (AAAS) Pacific Division last week.

"Almost all the talks contained data that had policy implications for the Galápagos National Park Service and the Charles Darwin Foundation," said James, an expert on the California Academy of Sciences' 1905-06 research expedition to the Galapagos. "The Galápagos symposium was a huge success and supremely productive, and it certainly exceeded my personal expectations in several ways."

Five of the archipelago's islands are inhabited by humans. One of the biggest threats facing the Galapagos today is the introduction of non-native species and the impact of humans themselves.

"The scientific community wants to keep the islands as virgin as possible," said Robert Tindle, professor emeritus at the University of Queensland in Brisbane, Australia. "This symposium brought everyone together who has an involvement, and they come to the table to discuss the best way of managing the islands."

Jen Jones, project manager of the Galapagos Conservation Trust in London, agreed. She gave a talk about conservation of the island's natural resources, and says having such a diverse group in one place leads to a holistic approach. "We can find solutions to problems that we couldn't find separately," she said.

The symposium included a tour of the Cal Academy, which many of the researchers were visiting for the first time.

James' research and presentations about the 1905-06 trip puts history into perspective and shows how far scientific inquiry has come. The 1905-06 expedition lasted 17 months, returning to San Francisco with over 70,000 biological specimens. Those new specimens became invaluable for rebuilding the museum at its present location in Golden Gate Park after the original downtown San Francisco site had been destroyed in the 1906 earthquake.

"We conduct science to learn about ecological interactions right now, or evolutionary events in the past," said James. "As historians we write about what specific people did in the past and what those actions mean to us now."

The way scientists would previously study animals had been to shoot them and bring them back to the lab for research. James' research and presentations about the 1905-06 trip puts history into perspective and shows us how far scientific research has shifted. "The emphasis has changed now on the way science is done to study more in the natural habitat," said Tindle.

After organizing a two-day symposium on the Galapagos for the AAAS meeting in 1999, James said he was glad to hear about new research, and get updates on long-term research projects from established workers.

--Nicolas Grizzle

Posted by Nicolas Grizzle on Wednesday, June 24, 2015 at 9:01 AM
Filed in Homepage

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Award Abstract #1340265

EC3 - Earth-Centered Communication for Cyberinfrastructure: Challenges of field data collection, management, and integration

NSF Org:	ICER ICER
Initial Amendment Date:	August 26, 2013
Latest Amendment Date:	August 26, 2013
Award Number:	1340265
Award Instrument:	Standard Grant
Program Manager:	Eva E. Zanzerkia ICER ICER GEO Directorate For Geosciences
Start Date:	September 15, 2013
End Date:	August 31, 2016 (Estimated)
Awarded Amount to Date:	$299,329.00
Investigator(s):	Matty Mookerjee matty.mookerjee@sonoma.edu (Principal Investigator) Thomas Shipley (Co-Principal Investigator) Basil Tikoff (Co-Principal Investigator) Amy Ellwein (Co-Principal Investigator) James Bowring (Co-Principal Investigator)
Sponsor:	Sonoma State University 1801 East Cotati Avenue Rohnert Park, CA 94928-3609 (707)664-4423
NSF Program(s):	EarthCube
Program Reference Code(s):	7433
Program Element Code(s):	8074

ABSTRACT

ABSTRACT

Scientists who work in the field have a common set of issues when it comes to documenting,storing, and representing data. Members from the different geological communities would benefitgreatly from the opportunity to discuss the types of data that they collect in the field with a group of cyberinfrastructure and software development professionals and researchers. By holding meetings in the field, the computer scientists will gain a better appreciation for the types of data that are typically collected in the field, common methods for collecting those data, the field tools/technology that are employed, data recording conventions, and the types of question typically addressed with these data. "The field" is an ideal location for appreciating geological concepts, and the very act of being in the field, together with other professionals, often foster personal connections that promote successful collaborations

and the exchange of ideas.

Work on this RCN will facilitate digitization of geological field data. The researchers will take steps to: 1) Document what exists currently for field data collection; 2) Assemble a community for discussing and exploring field data collection issues, specifically targeting young investigators; 3) Motivate distinct communities to work together on common issues associated with digitization; 4) Evaluate what is missing in the creation of open and accessible data. The objective of the RCN Proposal is to develop communication between cyberinfrastructure community and those involved in field-based, solid earth geoscience. In order to facilitate knowledge of the activities, they will conduct a series of both informal and formal meetings as national meetings - workshops at GSA and townhall meetings at AGU and AAPG). The goal of the initial meetings will be to: 1) foster community awareness of EarthCube-related activities, 2) discover and catalog the additional existing resources, 3) determine ways of giving publication ?credit? for recording and sharing digital data, 4) identify attributes of a clearinghouse website that would be most useful, and 5) find ways of motivating the community to move quickly toward digital data collection/conversion and data sharing.

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Smith Studies High Elevation Tectonics with NSF Grant

Professor Michael E. Smith of the Geology department is currently working with $86,000 with funding until 2016 from the National Science Foundation to pursue a research project exploring "Paleogeographic record of contractional to extensional tectonics in the Cordilleran hinterland, Nevada."

The project seeks to investigate the sedimentary record of the processes that formed and destroyed an Andes-like mountainous plateau and system of high altitude lakes in the location of present day Nevada.

The projects results will improve the understanding of the formation and destruction of high elevation regions worldwide, and give geologists and paleoclimate scientists more accurate input data to constrain their models for mountain formation and climate change in the past.

The project will directly involve several undergraduate researchers, and is a collaborative effort involving leading scientists at the University of Wisconsin-Madison, the University of Texas-Austin, and the University of Idaho.

For details, visit http://www.nsf.gov/awardsearch/showAward?AWD_ID=1322015.

Posted by Jean Wasp on Wednesday, April 16, 2014 at 3:38 PM
Filed in Achievements, Homepage SHARE

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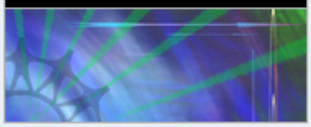

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Award Abstract #1322015

Collaborative Research: Paleogeographic Record of Contractional to Extensional Tectonics in the Cordilleran Hinterland, Nevada

NSF Org:	EAR Division Of Earth Sciences
Initial Amendment Date:	August 26, 2013
Latest Amendment Date:	August 26, 2013
Award Number:	1322015
Award Instrument:	Standard Grant
Program Manager:	Stephen S. Harlan EAR Division Of Earth Sciences GEO Directorate For Geosciences
Start Date:	September 1, 2013
End Date:	March 31, 2015 (Estimated)
Awarded Amount to Date:	$86,000.00
Investigator(s):	Michael Smith michael.smith@sonoma.edu (Principal Investigator)
Sponsor:	Sonoma State University 1801 East Cotati Avenue Rohnert Park, CA 94928-3609 (707)664-4423
NSF Program(s):	TECTONICS
Program Reference Code(s):	
Program Element Code(s):	1572

ABSTRACT

ABSTRACT

Orogen topography - elevation and relief - is a critical component in geodynamic models of the growth, evolution, and collapse of Earth's major mountain belts such as the Himalayas, Andes, and North American Cordillera. Although estimates of surface uplift are common, we lack precise records of past orogen topography: quantified changes in elevations, exhumation patterns, and drainage system evolution. The Cordilleran hinterland from Nevada to western Utah is interpreted as a Paleogene orogenic plateau, supported by compressional boundary forces, with mean elevations of 3-4 kilometers prior to Neogene extensional collapse. The Paleogene transition to extensional tectonics, however, and the presumed dynamic crustal response to flat slab removal remain poorly understood, particularly in portions of the hinterland overprinted by Neogene extension. Eocene fluvial and lacustrine sedimentary rocks in eastern Nevada - near the proposed paleo-divide - interbedded with volcanic units, span the time of this tectonic transition. Preliminary data show that these rocks provide crucial insights into the tectonic and surface processes during the transition from flat-slab subduction and contraction to extensional tectonics. This multi-disciplinary study will reconstruct the topography and morphology of the region, constrain the timing and magnitude of initial extension from ~50 to 30 million years ago, and build a tectonic model for the crust-mantle dynamics of the transition to extension. This includes the following: (1) fluvial and lacustrine basin sedimentology and stratigraphy to reconstruct drainages and basin morphology, (2) Argon geochronology of interbedded tuffs to reveal depositional history, sediment accumulation rates, and changes in deposition style over time; (3) stable isotope analyses of hydrated volcanic glasses and lacustrine carbonates to constrain paleoelevations and lake water chemistry over time, (4) detrital zircon U-Pb geochronology to reconstruct the fluvial drainage network and identify sediment provenance patterns, and (5) (U-Th)/He double dating of detrital zircon grains to pinpoint sources of similar crystallization age and quantify exhumation rates. The integration of multiple disciplines to quantify geodynamics is at the forefront of tectonics research. The proposed research will differentiate between proposed mechanisms for basin formation, so as to create a reproducible tectonic model of the collapse of the Cordilleran hinterland by tracking deep mantle processes through the surface record,. Our findings will help quantify the crustal response to heating, destabilization, and delamination in thrust belt hinterland regions, and have the potential to document a new mechanism for walled basin formation and basin hydrology on orogenic plateaus. Our final model of the surface expression of orogenic plateau collapse will improve our understanding of the crustal and mantle dynamics that drive the evolution and eventual degradation of regions of high elevation worldwide.

Approximately 45 million years ago, the state of Nevada resembled the Andes of western South America, the Earth's second highest mountain range. Since then, this high area has collapsed and extended into a series of smaller ranges separated by low elevation basins. During the initial phases of this collapse, a large lake (or series of smaller lakes) formed in what is now a very dry desert, similar to Lake Titicaca in Bolivia and Peru. The deposits of this lake and the rivers that flowed into it contain important clues about the evolution of the area. This project is an interdisciplinary study of how and why this ancient mountain range was destroyed, and how this affected the climate and environments of the region. Knowing past topography and geography is critical to understanding: (1) the construction, evolution, and collapse of mountains through plate tectonic movements, (2) the effect of changing topography on climate, precipitation, and surface/ground water transport, (3) the weathering, erosion, and shaping of Earth's surface, (4) the relationship between extension and the occurrence of super-volcanoes, and (5) the formation and development of economically-important oil, gas, and gold deposits. We will study layered sedimentary deposits (strata) that accumulated in Nevada during the initial phase of mountain collapse using several cutting-edge physical and chemical techniques. In the field, we will measure the thickness and composition of lake strata, which can tell us whether the lake was deep or shallow and salty or freshwater. We will also collect multiple volcanic ash beds that accumulated in the lake, and use crystals within those beds to determine high-precision age determines by measuring the radioactive decay of potassium within the crystal. Using water trapped within glass shards in these volcanic ash beds, we will determine the isotopic composition of ancient precipitation in order to estimate past elevations of the region. Finally, we will collect sandstone that was deposited by ancient rivers, and separate zircon crystals from them for a number of analyses. By measuring the respective amounts of Uranium, Thorium, and Lead from zircon mineral grains, we will determine the age of individual grain and when it was eroded from the rock they formed in. Combining all of the techniques outlined above, we will be able to answer the following questions: (1) What was the size and extent of this ancient lake and the corresponding drainage system? (2) What types of rocks were exposed and eroding at the surface 30-50 million years ago, and how quickly did they erode? (3) What was the past topography and relief of Nevada? and (4) When and how quickly did Nevada extend into the isolated desert basins and ranges that exist today?

In addition to the research objectives of this project, the award is contributing to support of two early career researchers; broadening of participation of underrepresented groups in an STEM discipline; involvement of graduate and undergraduates in research; contributions to research infrastructure; and contributions to geologic mapping and quantification of past extension, which is critical to understanding mineralization trends across the region, the formation of gold deposits, and the occurrence of geohazards such as earthquakes and volcanoes.

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Mookerjee Heading Pioneering Earth Science Digitization Project for Geological Research Data

Dr. Matty Mookerjee, Geology, is the principal investigator (PI) for a National Science Foundation grant totaling $299,329 to help create a pioneering cyber infrastructure for collecting and analyzing geological research data.

His project, which includes 13 other co-PIs, will help to facilitate the over-arching goals of the EarthCube project which seeks to transform how research is conducted through the development of integrated data management infrastructures across the Geosciences.

The vision of EarthCube is to revolutionize earth science investigations by promoting better data access, incorporating cyber-infrastructure into scientific workflow, and allowing increasing sophistication of analyses and modeling.

"A significant strength of EarthCube is its potential for breaking down the artificial barriers between subfields within the Earth Sciences, allowing us to ask new types of questions, and providing the means to contend with previously unanswerable questions," says Mookerjee.

Specifically, this grant funds the organization of two field excursions this coming summer to facilitate a dialogue between field-based geologists, computer scientists, and cognitive scientists concerning the types of unique problems faced by the geological community with respect to data format, standards, management, representation, and integration.

Mookerjee says members from the different geological sub-communities will greatly benefit from the opportunity to discuss the types of data that they collect in "the field" (i.e., outside in the natural environment) with a group of cyber-infrastructure and software development professionals/researcher.

"We hope that by having these meetings in the field, the computer scientists will gain a better appreciation for the types of data that we collect, common methods for collecting those data, the field tools/technology that we employ, our data recording conventions, and the types of question we try to address with our data," Mookerjee says. "There is no better place to gain this appreciation than in the field."

For the same reasons that students are brought into the field to explain fundamental concepts in geology, the field will also provide an excellent venue for engaging with computer and cognitive scientists about the multiple scales and interconnections of geological data, data collection techniques, and data representation, Mookerjee says.

"We anticipate that the computer scientists will be able to guide our conversations with information about computational limitations/consideration as well as informing us about existing database technologies," he notes.

This NSF funded grant supports the assembly of a Research Coordination Network (RCN) that fosters the collaborations between earth scientists and computer scientists and cognitive psychologists.

More information can be found at: http://www.nsf.gov/awardsearch/showAward?AWD_ID=1340265.

Posted by Jean Wasp on Wednesday, April 16, 2014 at 3:32 PM
Filed in Homepage

SSU Professor now a Governing Member of Charles Darwin Foundation for Galapagos Islands

Professor Matthew James has has been elected a Governing Member of the General Assembly of the Charles Darwin Foundation for the Galapagos Islands (CDF), an international group of scientists, conservationists, and policy makers that provides scientific research and technical information and financial assistance to ensure the proper preservation of the Galapagos Islands. For 50 years, CDF has worked closely with the Galapagos National Park Service, the main Ecuadorian government authority overseeing the safeguarding of the islands' natural resources. The governing body of CDF includes the President of Ecuador and HRH The Grand Duke of Luxembourg. James will travel annually to Quito and the Galapagos Islands to attend the annual meetings of the CDF General Assembly.

Professor James has researched Galapagos paleontology, conservation issues, and human history of the archipelago for 30 years. His current writing project is titled, "Collecting Evolution," and concerns the 1905-06 Galapagos scientific collecting expedition of the California Academy of Sciences which helped vindicate the early evolutionary findings of Charles Darwin.

Posted by Bryan Bell on Friday, November 18, 2011 at 10:55 AM
Filed in Homepage, Workplace

News Center

Main

February 12, 2009

DARWIN DISPATCH: GEOLOGY PROFESSOR TO WALK IN FOOTSTEPS OF CHARLES DARWIN IN GALAPAGOS ISLANDS

Sonoma State University Geology Professor Matt James sent this message last night about his plans to walk in the footsteps of Charles Darwin, the father of the theory of natural selection, whose 200th birthday is being celebrated today.

He writes from Quito, Ecuador:

"Darwin's big 200th is tomorrow (2/12), I will be here on the continent, off to Galapagos on 2/13 for 15 days on a boat the Tip Top IV, going ashore at all the places Darwin went ashore in 1835 and where the California Academy of Sciences expedition went ashore in 1905-06.

I am going to have all the 16 passengers on the Tip Top IV make "snow angels" in the white sand on a beach where Darwin went ashore to wish him a happy 200th, and we will toast to the great man right on the equatorwith the famous constellation the Southern Cross clearly visible - itwill be very festive.

Having studied Darwin's life an work since 1982 when I first went to Galapagos to study paleontology of the islands, and when I studied hislife and work at Oxford University in summer 1982, this trip is a great opportunity to celebrate his 200th birthday, and the 150th anniversary of publication of the "Origin of Species" in 1859.

I will be giving a few lectures on the Tip Top IV on Darwin, and evolution and the 1905-06 expedition, similar to what I do in my popular SSU course on the Hawaiian Islands.

There is a saying, 'once a landing spot, always a landing spot' and that is true in Galapagos, everyone goes ashore at the same places, from Buccaneers to Whalers to Darwin to scientific expeditions -- So I will literally and figuratively be walking in the footsteps of Darwin and others, and standing on the shoulders of giants."

Jean Wasp

September 16, 2014

In This Issue

- International Hall Ribbon Cutting
- Sculpture Exhibit in University Art Gallery
- Banned Books Week
- Benefits Open Enrollment Begins
- Faculty Recognized in the Community
- Visiting Artist Lecture Series
- Payroll and Benefits Workshop
- Social Sciences Lecture Series
- Line Dancing Classes
- SSU Sustainability Day

WorkPlace Archive

This Week in NewsCenter

Meet the Geology Department

Entering the doors to Darwin Hall, past the replica *Dilophosaurus*, lies the Geology Department, a department where faculty and staff understand that time in the classroom is not quite enough to enhance their student's educational experience. The Geology Department goes above and beyond, digging up information and new findings within the Bay Area's backyard.

"The SSU Geology Department is firmly committed to boots-on-the-ground field experience for its majors," shared Matt James, Department Chair.

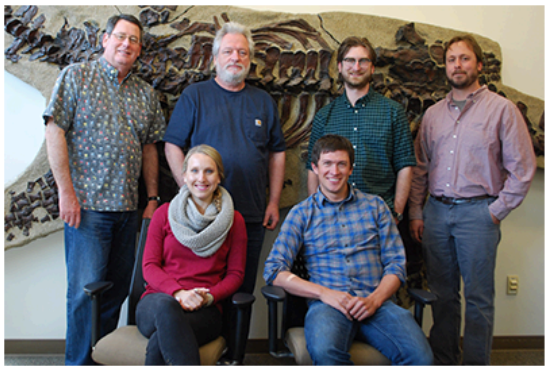
This department takes their teaching methods to the next level, providing ample opportunities for hands-on learning and field studies. Field research is a necessity within this department. Any place in the world where there is beautiful "scenery" is due to the geology of the area. Geologists are the ultimate ecotourists: the entire world is their desitnation.

"Our department teaches— including the GE students — a better understanding of the world around them. This can range from an increased awareness of hazards such as earthquakes to an appreciation of California's amazing geology" said Martha Murphy who teaches geology at Sonoma State.

With the exceptional surroundings of Sonoma County, students are given the resources to take the tools learned within the classroom out into the world. In order to create such a strong basis of field study research, the faculty and staff in the Geology Department offer a variety of programs to their students including, bachelor of science in geology, bachelor of arts in earth science, minor in geology, minor in paleontology, and secondary education teaching credential preparation.

"The geology department at Sonoma State University places a strong emphasis on the importance of field geology. Our department stands out because we utilize the world famous local geology in our backyard as a teaching tool to train our students in the most current field techniques," stated Phil Mooney, Department Tech.

For those interested in learning more about the Geology Department, visit http://sonoma.edu/geology/ and those wanting to say a quick hello can visit them at the coordinates of 38°20'24.08"N 122°40'30.00"W.



Top row from left to right: *Matthew James, professor and chair; John Collins, technician; Matty Mookerjee, professor; Michael Smith, associate professor.* ***Bottom row from left to right:*** *Liz Meyer, administrative coordinator and Phil Mooney, technician.* Photo by Liz Vargas.

References

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[1] See the California Department of Consumer Affairs, Board for Professional Engineers, Land Surveyors, and Geologists: http://www.bpelsg.ca.gov/

[2] See Cornell University Press web page on Sandra Herbert's 2005 book "Charles Darwin – Geologist": http://www.cornellpress.cornell.edu/book/?GCOI=80140100674520