

# ADRIENNE J. OAKLEY

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## EDUCATION

### **University of Hawai'i at Mānoa, Honolulu, HI**

PhD in Geology and Geophysics: December 2008

Dissertation: A multi-channel seismic and bathymetric investigation of the central Mariana convergent margin

Advisor: Brian Taylor

### **Bowdoin College, Brunswick, ME**

B.A. in Geology (with Honors) and French, May 2001. *Summa Cum Laude*

Thesis: The Seismic and Sedimentological Characteristics of the Upper New Meadows River, Midcoast Maine

Advisor: Edward Laine

### **Stendhal University, Grenoble, France: Fall 1999**

Swarthmore College study abroad program. All classes conducted in French.

## TEACHING EXPERIENCE

### **Kutztown University, Kutztown, Pennsylvania**

#### **Assistant Professor of Geology and Marine Science: 2009-present**

Teach Geology and Marine Science Courses, including

- Introduction to Oceanography + Lab
- Introduction to Geology + Lab
- Marine Geology + Lab
- Senior Seminar in Marine Science
- Sophomore Seminar In Marine Science
- Physical Oceanography
- Marine Geology, 3-week field intensive course taught at the Marine Science Consortium, Wallops Island, VA

### **University of Hawai'i, Honolulu, HI:**

- Teaching Assistant: Graduate Seminar: Fall 2008
- Lecturer in Marine Geology: Fall 2008
- Teaching Assistant: Introduction to Geology Lab: Spring 2008
- Teaching Assistant: Geophysical Methods: Spring 2008
- Developed Hawaii-based science curriculum through the *Malama I Ka 'Aina*: Sustainability Program at the University of Hawai'i: <http://malama.hawaii.edu>: Spring 2005

### **Sterling Memorial School, Sterling, CT: September 2001- February 2002**

- Substitute teacher for grades PK-8<sup>th</sup>

### **Bowdoin College, Brunswick, ME**

- Created an educational brochure on the geology of Vinalhaven Island, ME for the local school system: Spring 2000
- Quantitative Skills Mentor for Introductory Geology Courses: Fall 2000
  - Received mentor training and certification: College Reading and Learning Association for Regular Tutoring
  - Tutored students in graphing, statistics and basic geologic lab techniques
- Trained and mentored undergraduate students and assisted in student research: 1999-2001
- Teaching Assistant: The Fossil Record: Fall 1998

## **TEACHING INTERESTS**

Physical Geology, Marine Geology, Field course in Marine Geology, Oceanography, Marine Geophysics and Tectonics, Geophysical Methods, Geology of the Hawaiian Islands, Development of culturally relevant science curriculum, K-12 science education, Sustainability, Outreach and public education.

## **PROFESSIONAL EXPERIENCE**

**Graduate Research Assistant:** University of Hawai'i, June 2002-December 2008

- Process and interpret multi-channel seismic (MCS), gravity, magnetic and multibeam bathymetric data from the Mariana Subduction Factory
- Instruct other graduate students in seismic data processing
- ProMAX; SeisWorks; Paradigm; Generic Mapping Tool (GMT); UNIX; MATLAB, ArcGIS
- Manage MCS Processing Lab- software acquisition, data management

**Equipment Trainer and Technician:** Bowdoin College, Fall 2000- Spring 2001

- Maintained Geology Department equipment including: Trimble GPS, Vibracore, Digitizer, Work Boat, Core Lab, EchoSounder, DataSonics Chirp Sonar System
- Trained students in the use of department equipment and computer programs: Pathfinder, ArcView, Adobe Illustrator and Photoshop, GMT
- Assisted with student research in the field

**Assistant Project Coordinator: New Meadows River Watershed Steering Committee:** Brunswick, ME, May 1999- January 2001

- Created budget and co-developed Strategic Plan
- Served as secretary at all meetings and assisted in website development
- Served on Educational and Scientific subcommittees
- Participated in water testing
- Organized community outreach activities

**Sedimentary Lab Technician:** Bowdoin College, Spring 1999

- Cleaned, organized and maintained lab and supplies
- Assisted with student research

**Summer Research Assistant:** Bowdoin College, 1998

- GMT mapping, data analysis, future class planning

## **RESEARCH/FIELD EXPERIENCE**

**Research Cruise: Jurassic Ocean Crust Magnetic Survey 2011**, Kutztown University, Woods Hole Oceanographic Institute and Texas A&M, November 4-December 17, 2011

- Co-PI and Marine Geophysical Lead: R/V Thomas G. Thompson
- Collaborative Research: A DEEP-AUV Magnetic and Seismic Study of the Hawaiian Jurassic Crust - The Global Significance of Jurassic Magnetic Anomalies
  - Led multi-channel seismic acquisition group using SCRIPPS portable seismic system
  - Supervised a team of eight geophysical watch standers consisting of five undergraduate students and three recent college graduates. Watch standers deployed and retrieved instruments, monitored acquisition of bathymetry, backscatter, CHIRP sonar, gravity, and magnetic data, and created daily geophysical reports.
  - Wrote and edited KU student blogs for daily updates on the cruise website: <http://www.kutztown.edu/jocms2011/>

**Surface and Sub-Surface Mapping in the Coastal Zone of Wallops Island NASA Flight Facility: Monitoring Storm Response and Sea-Level Rise**, March 2011-present

- Collaborative research between Kutztown University undergrad students and faculty, Shippensburg University students and faculty, NASA and the Marine Science Consortium
  - Tide and storm surge monitoring, Analysis of current and historical storm data
  - Grain size analysis and sediment distribution/transport along Wallops Island
  - Assessing seasonal and storm-influenced geomorphic change before and after beach replenishment along Wallops shoreline using topographic profiling, sediment change statistics, as well as beach parallel GPS surveys.
  - Historical analysis of shoreline change on Wallops Island using GIS
  - Biological surveys. Distribution of macro fauna
  - Subsurface ground water mapping of the fresh water lens by Ground Penetrating Radar (GPR)

**Research Cruise: Lau Basin Spreading Center**, University of Hawai'i, April 6- May 9, 2004

- Shipboard Scientist: R/V Kilo Moana, Collaborative Research: Investigating the interrelationships between crustal structure, volcanism, and hydrothermal activity along the backarc East Lau Spreading Center
  - Seafloor mapping with DSL120 and IMI-30 (deep towed mapping systems)
  - Water chemistry surveys with Miniature Autonomous Plume Recorders (MAPRs) and towed CTD rosettes
  - Deployed and retrieved instruments, monitored acquisition of Hydrosweep bathymetry, gravity and magnetic data

**Research Cruise: Mariana Subduction Factory**, University of Hawai'i, 2002

- Shipboard Scientist: R/V Maurice Ewing, Multi-scale seismic imaging of the Mariana Subduction Factory, Ocean Bottom Seismometer (OBS) survey, April 1-26, 2002
  - OBS deployment and retrieval, and acquisition and processing of wide-angle seismic, multi-channel seismic, Hydrosweep DS2, gravity, and magnetic data.
- Shipboard Scientist: R/V Maurice Ewing, Multi-scale seismic imaging of the Mariana Subduction Factory, MCS survey, Feb. 24- March 26, 2002
  - Deployed and retrieved the airgun array and hydrophone streamer
  - Monitored data acquisition and processed multi-channel seismic data

**New Meadows River Mud Flat, Maine:** Bowdoin College, Summer 2000

- Sediment coring using Vibracore techniques
- Analyzed seismic and sedimentological data
- Modeled sea level change in Midcoast Maine (ArcView and ArcInfo)

- Presented work at the 2001 Northeastern Geological Society of America Meeting (NEGSA) and the National Conference on Undergraduate Research (NCUR)

**New Meadows River, Maine:** Bowdoin College, Summer 1999

- Geophysical survey using high-resolution Chirp Sonar, EchoSounder bathymetry, and DGPS navigation
- Presented work at 2000 NEGSA and NCUR

**Research Cruise: Bermuda Rise:** Woods Hole Oceanographic Institution, July 1998

- Shipboard Scientist: R/V Oceanus, Geophysical and geochemical investigation of the Bermuda Rise
  - Gravity and piston coring, High-resolution towed sonar, Seafloor and subsurface mapping, Water sampling and chemistry
  - Deployed and retrieved instruments, monitored data acquisition

## RESEARCH INTERESTS

Marine Geology/Geophysics, Tectonics, Subduction zone processes, Seafloor mapping, Multichannel seismic data interpretation, Serpentinite seamounts, Submarine volcanoes, Oceanic spreading centers, Hydrothermal vents, Seafloor drilling, Coastal zone processes, Shallow water seismic surveys, Sediment stratigraphy, Sea Level Change

## SERVICE

**Kutztown University, Kutztown, PA**

**Committees**

- KU Director- Marine Science Consortium Academic Advisory Council
- KU Marine Science Committee
- Co-Advisor: Marine Science Club
- 2010-11 Tenure-Track Chemistry Faculty Search Committee
- Kutztown University Commission on the Status of Women (2009-2010)

**Invited Talks**

- **Research Presentation:** Coastal Zone Research Symposium , Marine Science Consortium, Wallops Island, VA, May 16, 2012  
“Wallops Coastal Zone Mapping Report Part I: Water-level Monitoring, Coastal Hydrographic Assessment, and Shoreline Grain Size Analysis and Transport”
- **Invited Speaker:** Shippensburg Geography-Earth Science Department, March 9, 2012  
“Jurassic Ocean Crust Magnetic Survey, Expedition to the Pacific: Exploring the deepest and most remote seafloor in the world”
- **Invited Lecturer:** YWCA sponsored Great Decisions Foreign Policy Lecture Series, Kirkland Village retirement community in Bethlehem, PA, March 7, 2012  
“State of the Oceans, Waves of Change”
- **Invited Speaker:** Millersville University Earth Science Seminar, March 1, 2012
- **Invited Speaker:** Lehigh University Earth and Environmental Sciences Seminar, January 20, 2012  
"From Spreading to Subduction: Investigating Jurassic-age Oceanic Crust in the Western Pacific"
- **Invited Speaker:** Pennsylvania Earth Sciences Association, May 2010

**Other Service**

- Member of a master’s thesis committee for a graduate student at Shippensburg University
- Berks’ Best Judge, Served as a judge for the science category, Spring 2011, 2012
- Volunteer: Science Open House Volunteer, Fall 2009, 2010, Spring 2011, 2012
- Volunteer: KU Academic Marketplace Volunteer, Fall 2009, 2010, 2011
- Led Geology Club Students on a fieldtrip to Hawaii to explore Hawaiian volcanism, past and present, January 2010

## **Manuscript Review**

*Geochemistry, Geophysics, Geosystems*

## **Kutztown University**

- Invited Speaker: Women in Science Program: September 2008

## **University of Hawai'i, Honolulu, HI:**

- President: UH Geophysical Society (Student section for the Society of Exploration Geophysicists (SEG): 2006-2008
- Chair: Geology and Geophysics (GG) Department New Student Welcoming Committee: 2003-2008
- Student Member: GG Faculty Search Committee: Summer-Fall 2007
- Volunteer: School of Earth Science and Technology (SOEST) Open House: Fall 2005, 2007
- Judge: Hawaii Ocean Science Bowl: 2006, 2007
- 3<sup>rd</sup> Grade Geology Field Trip Leader, Salt Lake Elementary School, Honolulu, HI: Fall 2006
- Volunteer: UH Rainbow Nights: Met with local high school seniors to talk about higher education and programs in Geology and Oceanography: Spring 2005
- Volunteer: Kailua Beach Community Day: Spring 2005

## **AWARDS AND SCHOLARSHIPS RECIEVED**

Society of Exploration Geophysicists (SEG) Scholarship Winner: 2003 and 2007

Winner of the Outstanding Student Paper Award in Tectonophysics, AGU: Fall 2002

Research Corporation of the University of Hawai'i (RCUH) Scholarship Winner: 2002-2006

Phi Beta Kappa, Bowdoin College: 2001

NCUR and Doherty grants award winner, Bowdoin College: 1999, 2000

Sarah & James Bowdoin Scholar, Bowdoin College: 1998, 1999

Goldwater Scholarship Award Winner, Bowdoin College: 1998

## **LANGUAGES**

Proficient in French, knowledge of American Sign Language

## **PROFESSIONAL MEMBERSHIPS and COMMITTEES**

American Geophysical Union (AGU)

Geological Society of America (GSA)

National Association of Geoscience Teachers

Society of Exploration Geophysicists (SEG)

## **FUNDED RESEARCH GRANTS**

### **Surface and Sub-Surface Mapping in the Coastal Zone of Wallops Island NASA Flight Facility: Monitoring Storm Response and Sea-Level Rise**

NASA Wallops Flight Facility award- \$10,000, November 2011

Principle Investigators: Adrienne Oakley (KUP) and Sean Cornell (Shippensburg University)

### **Wallops Island Shoreline-NASA-Marine Science Consortium Collaborative Research**

Kutztown University Research Committee- \$6,285, December 2010- June 2012

**Collaborative Research: A DEEP-AUV Magnetic and Seismic Study of the Hawaiian Jurassic Crust - The Global Significance of Jurassic Magnetic Anomalies**

National Science Foundation (NSF) - \$71,928, September 2010-2012

**Cruise dates: November 4- December 17, 2011**

Lead-PI: Masako Tominaga (WHOI)

Co-PIs: Daniel Lizarralde (WHOI), Adrienne Oakley (KUP), Maurice A. Tivey (WHOI), William W. Sager (TAMU)

**PUBLICATIONS**

**PAPERS**

Oakley, A.J., B. Taylor, G.F. Moore and E. Chapp, Sedimentary, volcanic and tectonic processes of the central Mariana arc system: A seismic stratigraphic and structural analysis of the frontal arc high and inner forearc, In Prep.

Oakley, A.J., B. Taylor, G.F. Moore and A. Goodliffe (2009), Sedimentary, volcanic and tectonic processes of the central Mariana arc: Mariana Trough backarc basin formation and the West Mariana Ridge, *Geochemistry, Geophysics, Geosystems*, 10, 8, doi:10.1029/2008GC002312

Chapp, E., B. Taylor, A. Oakley, G. Moore (2008), A seismic stratigraphic analysis of Mariana forearc basin evolution, *Geochemistry, Geophysics, Geosystems*, 9, Q10X02, doi:10.1029/2008GC001998

Oakley, A.J., B. Taylor, and G.F. Moore (2008), Pacific Plate Subduction beneath the central Mariana and Izu-Bonin Forearcs: New insights on an old margin, *Geochemistry, Geophysics, Geosystems*, 9, Q06003, doi:10.1029/2007GC001820

Oakley, A.J., B. Taylor, P. Fryer, G.F. Moore, A.M. Goodliffe, and J.K. Morgan (2007), Emplacement, Growth, and Gravitational Deformation of Serpentinite Seamounts on the Mariana Forearc, *Geophysical Journal International*, doi: 10.1111/j.1365-246X.2007.03451.x

**PROFESSIONAL PRESENTATIONS/ABSTRACTS**

*(Italics indicate student author)*

*Chariw, J. E.; Sabetta, M. J.; Oakley, A. J.; Cornell, S. R.;* Monitoring in situ tidal range and surface aquifer recharge and discharge on Wallops Island, Virginia, *2012 ASLO-AGU Ocean Sciences Meeting*, Abstract ID:11742, 2012

*Woodlief, V. A.; Cornell, S. R.; Sabetta, M.; Sergent, E.; McGilliard, E.; Oakley, A.;* A GIS analysis of the Chincoteague inlet eddy and its impact on the shoreline morphology of northern Wallops Island, Eastern Shore Virginia, *2012 ASLO-AGU Ocean Sciences Meeting*, Abstract ID:1121, 2012

*Mcgilliard, E., Cornell, S. R., and Oakley, A.,* High resolution GIS mapping of shoreline change at Wallops Island, Virginia: A preliminary investigation of the impact of Hurricane Irene, *Abstracts with Programs- Geological Society of America 44 (2,)* GSA Annual Meeting, Northeastern Section, 2012

*Williams, J., Cornell, S. R., and Oakley, A.,* Preliminary investigation of a barrier island beach aquifer at Wallops Island, Virginia using ground penetrating radar, *Abstracts with Programs- Geological Society of America 44 (2,)* GSA Annual Meeting, Northeastern Section, 2012

- Goodliffe, A. M. and A. Oakley, MARGINS mini-lessons: A tour of the Mariana Subduction System, *Eos Trans. AGU*, 90(52), *Fall Meet. Suppl.*, Abstract ED24A-03, 2009
- Chapp, E., B. Taylor, A. Oakley, G. Moore, Seismic stratigraphy of the Mariana forearc sedimentary basin. *Eos Trans. AGU, Fall meeting Suppl.* Abstract T53A-1403, 2005
- Oakley, A.J., B. Taylor, E. Chapp, G. Moore, Imaging the subducting Pacific plate beneath the Mariana Forearc, *Eos Trans. AGU, Fall meeting Suppl.*, Abstract T53A-1404, 2005
- Oakley, A.J., B. Taylor, G.F. Moore, P. Fryer, J.K. Morgan, A.M. Goodliffe, Emplacement and Growth of Serpentinite Seamounts on the Mariana Forearc, *EOS Trans. AGU, Fall Meeting Suppl.*, 85., Abstract T41D-1248, 2004
- Oakley, A.J., A.M Goodliffe, B. Taylor, G.F. Moore, P. Fryer, EW0202 Scientific Party, Multi-Channel Seismic Images of the Mariana Forearc: EW0202 Initial Results, *Eos Trans. AGU*, 83 (47) *Fall Meeting Suppl.*, Abstract T72A-1229, 2002
- Taylor, B., A.M Goodliffe, G.F. Moore, A.J. Oakley, P. Fryer, EW0202 Scientific Party, Multi-Channel Seismic Images of the Mariana Trough: EW0202 Initial Results, *Eos Trans. AGU*, 83 (47) *Fall Meeting Suppl.*, Abstract T72A-1228, 2002
- Oakley, A.J., Seismic and sedimentological characteristics of the New Meadows River, mid-coast Maine, *Abstracts with Programs- Geological Society of America*, 33 (1), GSA Annual Meeting, Northeastern Section, 2001.
- Oakley, A.J., E.P. Laine, A preliminary study of the seismic stratigraphy of the New Meadows River, *Abstracts with Programs- Geological Society of America*, 32 (1), GSA Annual Meeting, Northeastern Section, 2000