

**KECK GEOLOGY CONSORTIUM**

**PROCEEDINGS OF THE TWENTY-FIFTH  
ANNUAL KECK RESEARCH SYMPOSIUM IN  
GEOLOGY**

April 2012  
Amherst College, Amherst, MA

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Washington & Lee University, Wesleyan University, Whitman College, Williams College**

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**2011-2012 PROJECTS**

**TECTONIC EVOLUTION OF THE CHUGACH-PRINCE WILLIAM TERRANE, SOUTH-CENTRAL ALASKA**

Faculty: *JOHN GARVER*, Union College, *Cameron Davidson*, Carleton College

Students: *EMILY JOHNSON*, Whitman College, *BENJAMIN CARLSON*, Union College, *LUCY MINER*, Macalester College, *STEVEN ESPINOSA*, University of Texas-El Paso, *HANNAH HILBERT-WOLF*, Carleton College, *SARAH OLIVAS*, University of Texas-El Paso.

**ORIGINS OF SINUOUS AND BRAIDED CHANNELS ON ASCRAEUS MONS, MARS**

Faculty: *ANDREW DE WET*, Franklin & Marshall College, *JAKE BLEACHER*, NASA-GSFC, *BRENT GARRY*, Smithsonian

Students: *JULIA SIGNORELLA*, Franklin & Marshall College, *ANDREW COLLINS*, The College of Wooster, *ZACHARY SCHIERL*, Whitman College.

**TROPICAL HOLOCENE CLIMATIC INSIGHTS FROM RECORDS OF VARIABILITY IN ANDEAN PALEOGLACIERS**

Faculty: *DONALD RODBELL*, Union College, *NATHAN STANSELL*, Byrd Polar Research Center

Students: *CHRISTOPHER SEDLAK*, Ohio State University, *SASHA ROTHENBERG*, Union College, *EMMA CORONADO*, St. Lawrence University, *JESSICA TREANTON*, Colorado College.

**EOCENE TECTONIC EVOLUTION OF THE TETON-ABSAROKA RANGES, WYOMING**

Faculty: *JOHN CRADDOCK*, Macalester College, *DAVE MALONE*, Illinois State University

Students: *ANDREW KELLY*, Amherst College, *KATHRYN SCHROEDER*, Illinois State University, *MAREN MATHISEN*, Augustana College, *ALISON MACNAMEE*, Colgate University, *STUART KENDERES*, Western Kentucky University, *BEN KRASUSHAAR*

**INTERDISCIPLINARY STUDIES IN THE CRITICAL ZONE, BOULDER CREEK CATCHMENT, FRONT RANGE, COLORADO**

Faculty: *DAVID DETHIER*, Williams College

Students: *JAMES WINKLER*, University of Connecticut, *SARAH BEGANSKAS*, Amherst College, *ALEXANDRA HORNE*, Mt. Holyoke College

**DEPTH-RELATED PATTERNS OF BIOEROSION: ST. JOHN, U.S. VIRGIN ISLANDS**

Faculty: *DENNY HUBBARD* and *KARLA PARSONS-HUBBARD*, Oberlin College

Students: *ELIZABETH WHITCHER*, Oberlin College, *JOHNATHAN ROGERS*, University of Wisconsin-Oshkosh, *WILLIAM BENSON*, Washington & Lee University, *CONOR NEAL*, Franklin & Marshall College, *CORNELIA CLARK*, Pomona College, *CLAIRE McELROY*, Otterbein College.

**THE HRAFNFJORDUR CENTRAL VOLCANO, NORTHWESTERN ICELAND**

Faculty: *BRENNAN JORDAN*, University of South Dakota, *MEAGEN POLLOCK*, The College of Wooster

Students: *KATHRYN KUMAMOTO*, Williams College, *EMILY CARBONE*, Smith College, *ERICA WINELAND-THOMSON*, Colorado College, *THAD STODDARD*, University of South Dakota, *NINA WHITNEY*, Carleton College, *KATHARINE*, *SCHLEICH*, The College of Wooster.

**SEDIMENT DYNAMICS OF THE LOWER CONNECTICUT RIVER**

Faculty: *SUZANNE O'CONNELL* and *PETER PATTON*, Wesleyan University

Students: *MICHAEL CUTTLER*, Boston College, *ELIZABETH GEORGE*, Washington & Lee University, *JONATHAN SCHNEYER*, University of Massachusetts-Amherst, *TIRZAH ABBOTT*, Beloit College, *DANIELLE MARTIN*, Wesleyan University, *HANNAH BLATCHFORD*, Beloit College.

**ANATOMY OF A MID-CRUSTAL SUTURE: PETROLOGY OF THE CENTRAL METASEDIMENTARY BELT BOUNDARY THRUST ZONE, GRENVILLE PROVINCE, ONTARIO**

Faculty: *WILLIAM PECK*, Colgate University, *STEVE DUNN*, Mount Holyoke College, *MICHELLE MARKLEY*, Mount Holyoke College

Students: *KENJO AGUSTSSON*, California Polytechnic State University, *BO MONTANYE*, Colgate University, *NAOMI BARSHI*, Smith College, *CALLIE SENDEK*, Pomona College, *CALVIN MAKO*, University of Maine, Orono, *ABIGAIL MONREAL*, University of Texas-El Paso, *EDWARD MARSHALL*, Earlham College, *NEVA FOWLER-GERACE*, Oberlin College, *JACQUELYNE NESBIT*, Princeton University.

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**Keck Geology Consortium: Projects 2011-2012**  
**Short Contributions—South-Central Alaska Project**

**TECTONIC EVOLUTION OF THE CHUGACH-PRINCE WILLIAM TERRANE IN PRINCE WILLIAM SOUND AND KODIAK ISLAND, ALASKA**

Project Faculty: JOHN GARVER, Union College, CAMERON DAVIDSON, Carleton College

**ANALYSIS OF DETRITAL ZIRCON FISSION TRACK AGES OF THE UPPER CRETACEOUS VALDEZ GROUP AND PALEOGENE ORCA GROUP IN WESTERN PRINCE WILLIAM SOUND, ALASKA**

BENJAMIN M. CARLSON, Union College

Research Advisor: John I. Garver

**PALEOMAGNETISM OF THE KNIGHT ISLAND OPHIOLITE, PRINCE WILLIAM SOUND, ALASKA**

STEVEN ESPINOSA, University of Texas at El Paso

Research Advisor: Terry Pavlis

**U-Pb DETRITAL ZIRCON PROVENANCE OF THE PALEOGENE ORCA GROUP, CHUGACH-PRINCE WILLIAM TERRANE, ALASKA**

HANNAH LOUISE HILBERT-WOLF, Carleton College

Research Advisors: Cameron Davidson & John Garver

**ORIGIN OF THE LATE EOCENE ESHAMY SUITE GRANITOIDS IN WESTERN PRINCE WILLIAM SOUND, ALASKA**

EMILY JOHNSON, Whitman College

Research Advisor: Kirsten Nicolaysen

**GEOCHEMISTRY OF THE KNIGHT ISLAND OPHIOLITE AND CHENEGA ISLAND VOLCANICS, PRINCE WILLIAM SOUND, ALASKA**

LUCY MINER, Macalester College

Research Advisor: Karl R. Wirth

**U/PB DETRITAL ZIRCON STUDY OF THE UPPER CRETACEOUS TO MIOCENE STRATA OF KODIAK ISLAND, ALASKA**

SARAH J. OLIVAS, University of Texas at El Paso

Research Advisor: Diane I. Doser

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**Keck Geology Consortium: Projects 2011-2012**  
**Short Contributions— Ascraeus Mons, Mars Project**

**ORIGINS OF SINUOUS AND BRAIDED CHANNELS ON ASCRAEUS MONS, MARS**

Project Faculty: ANDREW DE WET, Franklin & Marshall College, JAKE BLEACHER, NASA-GSFC, BRENT GARRY, Smithsonian

**A COMPARISON AND ANALOG-BASED ANALYSIS OF SINUOUS CHANNELS ON THE RIFT APRONS OF ASCRAEUS MONS AND PAVONIS MONS VOLCANOES, MARS**

ANDREW COLLINS, The College of Wooster  
Research Advisors: Andy De Wet, Jake Bleacher, & Shelley Judge

**ORIGIN OF SINUOUS CHANNELS ON THE SW APRON OF ASCRAEUS MONS AND THE SURROUNDING PLAINS, MARS**

ZACHARY SCHIERL, Whitman College  
Research Advisor: Patrick Spencer

**VOLCANIC OR FLUVIAL CHANNELS ON THE SOUTH-EAST RIFT APRON OF ASCRAEUS MONS**

JULIA SIGNORELA, Franklin and Marshall College  
Research Advisor: Andy De Wet

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**Keck Geology Consortium: Projects 2011-2012  
Short Contributions— Peruvian Glaciers Project**

**TROPICAL HOLOCENE CLIMATIC INSIGHTS FROM RECORDS OF VARIABILITY IN ANDEAN  
PALEOGLACIERS**

Project Faculty: DONALD T. RODBELL, Union College & NATHAN STANSELL, Byrd Polar Research Center,  
Ohio State University

**XRD ANALYSIS OF SEDIMENT-CORE MATERIAL AS AN INDICATOR OF THE TRANSITION  
FROM VALLEY GLACIERS TO CIRQUE DWELLING GLACIERS IN THE PERUVIAN CENTRAL  
CORDILLERA**

EMMA A. CORONADO, St. Lawrence University  
Research Advisor: Alexander K. Stewart

**GLACIAL LACUSTRINE RECORDS OF CLIMATE VARIATION IN THE TROPICAL PERUVIAN  
ANDES**

SASHA ROTHENBERG, Union College  
Research Advisor: Donald Rodbell

**HOLOCENE GLACIAL VARIABILITY RECORDED IN LAKE SEDIMENTS FROM NEVADO  
HUAGURUNCHO, PERU**

CHRISTOPHER SEDLAK, Ohio State University  
Research Advisor: Nathan Stansell

**HOLOCENE CLIMATE CHANGE AND GLACIAL EVOLUTION OF THE CENTRAL PERUVIAN  
ANDES: LACUSTRINE RECORD FROM THE PROGLACIAL LAKE JAICO**

JESSICA TRÉANTON, Colorado College  
Research Advisor: Donald T. Rodbell

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**Keck Geology Consortium: Projects 2011-2012**  
**Short Contributions— Teton-Absaroka Ranges, Wyoming Project**

**EOCENE TECTONIC EVOLUTION OF THE TETON-ABSAROKA RANGES, WYOMING**

Project Faculty: JOHN P. CRADDOCK, Macalester College & DAVE MALONE, Illinois State University

**DETRITAL ZIRCON PROVENANCE STUDY OF YELLOW SANDSTONES FROM THE WILLWOOD FORMATION IN THE BIGHORN BASIN, WYOMING, USA**

ANDREW L. KELLY, Amherst College

Research Advisors: Tekla A. Harms & Peter D. Crowley

**A MINERALOGICAL TEXTURAL AND CHEMICAL CHARACTERIZATION OF A HYPOTHESIZED KIMBERLITE AT WHITE MOUNTAIN, SUNLIGHT BASIN, WYOMING**

STUART KENDERES, Western Kentucky University

Research Advisor: Andrew Wulff

**THE DYNAMICS AND EMPLACEMENT OF THE HEART MOUNTAIN DETACHMENT: ANISOTROPY OF MAGNETIC SUCEPTIBILITY AND DETRITAL ZIRCON ANALYSIS OF VERTICAL INJECTITES AT WHITE MOUNTAIN AND SILVERGATE, WYOMING**

BENJAMIN KRAUSHAAR, Fort Lewis College

Research Advisor: John P. Craddock

**STRUCTURAL EVOLUTION OF THE EOCENE SOUTH FORK DETACHMENT, PARK COUNTY, WYOMING**

ALISON MACNAMEE, Colgate University

Research Advisor: Martin Wong

**CALCITE TWINNING STRAIN ANALYSIS OF THE ALLOCHTHONOUS JURASSIC SUNDANCE, SOUTH FORK DETACHMENT, NORTHWEST WYOMING**

MAREN MATHISON, Augustana College

Research Advisor: Jeffrey Strasser & Michael Wolf

**PROVENANCE ANALYSIS OF THE WAPITI FORMATION (EOCENE) SANDSTONE IN THE ABSAROKA BASIN, WY USING DETRITAL ZIRCON GEOCHRONOLOGY**

KAT HRYN SCHROEDER, Illinois State University

Research Advisor: David H. Malone

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**Keck Geology Consortium: Projects 2011-2012  
Short Contributions— Front Range, CO Project**

**KECK COLORADO PROJECT: INTERDISCIPLINARY STUDIES IN THE CRITICAL ZONE,  
BOULDER CREEK CATCHMENT, FRONT RANGE, COLORADO**

Project Faculty: DAVID P. DETHIER, Williams College & WILL OUMET, University of Connecticut

**THE GEOCHEMICAL IMPACT OF WILDFIRE AND MINING ON THE FOURMILE CREEK  
WATERSHED**

SARAH BEGANSKAS, Amherst College

Research Advisor: Anna Martini

**QUANTIFYING PHYSICAL CHARACTERISTICS AND WEATHERING OF BEDROCK IN RELATION  
TO LANDSCAPE DEVELOPMENT IN THE COLORADO FRONT RANGE**

ALEXANDRA HORNE, Mt. Holyoke College

Research Advisor: David Dethier

**THE HYDROLOGY AND GEOCHEMISTRY OF TWO SNOWMELT-DOMINATED, ALPINE STREAMS  
IN THE BOULDER CREEK CRITICAL ZONE OBSERVATORY, FRONT RANGE, COLORADO**

JAMES N. WINKLER, University of Connecticut

Research Advisor: Will Ouimet

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**Keck Geology Consortium: Projects 2011-2012**  
**Short Contributions— Virgin Islands Project**

**DEPTH-RELATED CARBONATE CYCLING IN A MODERN REEF: ST. JOHN, U.S. VIRGIN ISLANDS**

Project Faculty: DENNIS K. HUBBARD, Oberlin College & KARLA PARSONS-HUBBARD, Oberlin College

**ESTIMATING DEPTH RELATED REEF CARBONATE PRODUCTION PATTERNS OFF ST. JOHN, USVI**

WILLIAM MATTHEW BENSON, Washington and Lee University

Research Advisor: Lisa Greer

**INVESTIGATING ENDOLITHIC ALGAE PROLIFERATION USING STABLE CARBON ISOTOPES IN BOULDER STAR CORAL**

CORNELIA CLARKE, Pomona College

Research Advisor: Robert Gaines

**POST-BLEACHING ENCRUSTATION HABITS IN USVI CORAL REEFS**

CLAIRE MCELROY, Otterbein University

Research Advisor: Halard Lescinsky

**DEPTH-RELATED PATTERNS OF ABUNDANCE, DISTRIBUTION, AND CARBONATE PRODUCTION FOR MICROBORING ORGANISMS: ST. JOHN, US VIRGIN ISLANDS**

CONOR NEAL, Franklin and Marshall College

Research Advisor: Roger Thomas

**DEPTH RELATED DISTRIBUTION AND ABUNDANCE OF MICROBORING ORGANISMS: ST. JOHN, US VIRGIN ISLANDS**

JONATHAN ROGERS, University of Wisconsin - Oshkosh

Research Advisor: Eric Hiatt

**MACROBIOEROSION RATES OF IN-SITU CORAL COLONIES: ST. JOHN, U.S. VIRGIN ISLANDS**

ELIZABETH WHITCHER, Oberlin College

Research Advisor: Dennis Hubbard

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**Keck Geology Consortium: Projects 2011-2012**  
**Short Contributions— Northwestern Iceland Project**

**CRUSTAL MAGMATIC PROCESSES IN ICELAND'S OLDEST CENTRAL VOLCANO**

Project Faculty: BRENNAN JORDAN, University of South Dakota, MEAGEN POLLOCK, The College of Wooster, JEANNE FROMM, University of South Dakota

**THE HRAFNFJORDUR CENTRAL VOLCANO: PETROGENESIS OF LAVAS IN THE EARLY STAGES OF AN ICELANDIC RIFT ZONE**

EMILY CARBONE, Smith College  
Research Advisor: Mark Brandriss

**MAGMATIC PROCESSES OF THE HRAFNFJÖRÐUR CENTRAL VOLCANO, NORTHWEST ICELAND**

KATHRYN KUMAMOTO, Williams College  
Research Advisor: Reinhard Wobus

**A GEOCHEMICAL AND PETROLOGIC ANALYSIS OF THE HRAFNFJORDUR CENTRAL VOLCANO, WESTFJORDS, ICELAND**

KATHARINE SCHLEICH, The College of Wooster  
Research Advisor: Meagen Pollock

**ORIGIN OF SILICIC VOLCANISM AT SAURATINDUR, NORTHWEST ICELAND**

THAD STODDARD, University of South Dakota  
Research Advisor: Brennan Jordan

**GEOCHEMICAL ANALYSIS OF TERTIARY DIKES HRAFNFJORDUR CENTRAL VOLCANO, NORTHWEST ICELAND: IMPLICATIONS FOR DIKE ORIGIN**

NINA WHITNEY, Carleton College  
Research Advisor: Cameron Davidson

**PETROLOGIC AND GEOCHEMICAL CHARACTERIZATION OF BASALTIC AND INTERMEDIATE MAGMAS IN AN ABANDONED TERTIARY RIFT, NORTHWEST ICELAND**

ERICA WINELAND-THOMSON, Colorado College  
Research Advisor: Jeff Noblett

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**Keck Geology Consortium: Projects 2011-2012  
Short Contributions— Connecticut River Project**

**ANTHROPOGENIC IMPACTS AND ENVIRONMENTAL CHANGES RECORDED IN THE IN THE  
DEPOSITIONAL HISTORY OF THE LOWER CONNECTICUT RIVER**

Project Faculty: SUZANNE O'CONNELL Wesleyan University

**FRESH-WATER DIATOMS AS BIOINDICATORS OF POLLUTION IN SELDEN COVE,  
CONNECTICUT RIVER**

TIRZAH ABBOT, Beloit College

Research Advisor: Carl Mendelson

**GEOCHEMICAL CHARACTERIZATION OF TIDAL COVES OF THE CONNECTICUT RIVER  
ESTUARY**

HANNAH BLATCHFORD, Beloit College

Research Advisor: Carl Mendelson

**VARIABILITY OF SUSPENDED-SEDIMENT DISTRIBUTION IN THE CONNECTICUT RIVER  
ESTUARY**

MICHAEL CUTLER, Boston College

Research Advisor: Gail Kineke

**RECONSTRUCTING ENVIRONMENTAL CHANGES IN THE LOWER CONNECTICUT RIVER USING  
DIATOMS**

ELIZABETH JEAN GEORGE, Washington and Lee University

Research Advisor: David J. Harbor

**INVASIVE FRESHWATER CLAM, CORBICULA FLUMINEA, HABITATS IN THE LOWER  
CONNECTICUT RIVER**

DANIELLE MARTIN, Wesleyan University

Research Advisor: Suzanne O'Connell

**COMPARING SEDIMENT DEPOSITION USING MERCURY INVENTORIES FOR BACK-WATER AND  
SALT MARSH ENVIRONMENTS**

JONATHAN SCHNEYER, University of Massachusetts Amherst

Research Advisor: Jon Woodruff

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**Keck Geology Consortium: Projects 2011-2012**  
**Short Contributions— Grenville Province, Ontario Project**

**PETROLOGY AND STRUCTURE OF THE CENTRAL METASEDIMENTARY BELT BOUNDARY THRUST ZONE ITS HANGING WALL, GRENVILLE PROVINCE, ONTARIO**

Project Faculty: WILIAM H. PECK, Colgate University, STEVEN R. DUNN, Mount Holyoke College  
MICHELLE J. MARKLEY, Mount Holyoke College

**GEOCHEMISTRY AND GEOCHRONOLOGY OF CENTRAL METASEDIMENTARY BELT BOUNDARY THRUST ZONE THRUST SHEETS IN SOUTHERN ONTARIO, GRENVILLE PROVINCE**

KENJO S. AGUSTSSON, California Polytechnic State University, San Luis Obispo  
Research Advisor: Scott Johnston

**CONFLICTING KINEMATICS OF THE SALERNO CREEK DEFORMATION ZONE, GRENVILLE PROVINCE, ONTARIO**

NAOMI BARSHI, Smith College  
Research Advisor: Jack Loveless

**THERMOBAROMETRIC EVIDENCE FOR A COMMON CENTRAL METASEDIMENTARY BELT AFFINITY OF THE BANCROFT AND ELZEVIR TERRANES, ONTARIO, CANADA**

NEVA FOWLER-GERACE, Oberlin College  
Research Advisor: F. Zeb Page

**HETEROGENEOUS DEFORMATION OF GABBROIC ROCKS**

CALVIN MAKO, University of Maine  
Research Advisor: Christopher Gerbi

**PETROLOGY AND GEOCHEMISTRY OF THE ALLSAW ANORTHOSITE: A SCAPOLITIZED META-ANORTHOSITE IN GRENVILLE PROVINCE, ONTARIO**

EDWARD W. MARSHALL, Earlham College  
Research Advisor: Meg Streepey Smith

**GARNET-BIOTITE GEOTHERMOBAROMETRY OF THE CENTRAL METASEDIMENTARY BELT BOUNDARY THRUST ZONE OF THE GRENVILLE PROVINCE, ONTARIO, CANADA**

ABIGAIL MONREAL, University of Texas at El Paso  
Research Advisor: Jasper G. Konter

**CARBON ISOTOPE THERMOMETRY IN THE CENTRAL METASEDIMENTARY BELT BOUNDARY THRUST ZONE**

**GRENVILLE PROVINCE, ONTARIO**

BO MONTANYE, Colgate University  
Research Advisor: William H. Peck

**CALCITE-GRAPHITE THERMOMETRY IN THE SOUTHWESTERNMOST CENTRAL METASEDIMENTARY BELT, GRENVILLE PROVINCE, SOUTHERN ONTARIO**

JACQUELYNE NESBIT, Princeton University  
Research Advisor: Blair Schoene

**USING STRUCTURAL ANALYSES TO ASSESS POSSIBLE FORMATION MECHANISMS OF THE  
CHEDDAR GNEISS DOME**

CALIE SENDEK, Scripps College

Research Advisor: Linda Reinen

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