

PROCEEDINGS OF THE TWENTY-NINTH ANNUAL KECK RESEARCH SYMPOSIUM IN GEOLOGY

April 2017
Wesleyan University, CT

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2016-2017 PROJECTS

TEPHRASTRATIGRAPHY IN ICELAND

Faculty: ANDREW DE WET, Franklin & Marshall College and CHRISTOPHER HAMILTON, University of Arizona:

Students: ALEXANDRA HUFF, Northern Arizona University, JONATHAN MAGEE, Franklin & Marshall College, ANNY SAINVIL, Smith College, KRYSTINA LINCOLN, Williams College, LUCAS ZELLER, Amherst College, WILLIAM SPEISER, Wesleyan University

DENDROCHONOLOGICAL ANALYSIS OF INSULAR FOREST STANDS IN RELATION TO CLIMATE AND WATER-LEVEL FLUCTUATIONS IN THE GREAT LAKES:

Faculty: KIM DIVER, Wesleyan University

Students: LEAH BOURNIVAL, Mt. Holyoke College, EZRA STEINFELD, Wesleyan University, MATTHEW KELLY, Beloit College

HISTORICAL ECOLOGY OF MARINE MOLLUSKS IN THE NORTHERN GULF OF MEXICO: INVESTIGATING ANTHROPOGENIC IMPACTS IN COASTAL ECOSYSTEMS THROUGH LIVE-DEAD ANALYSIS:

Faculty: PAUL HARNIK, Franklin & Marshall College.

Students: MORGAN TORSTENSON, Franklin & Marshall College, ANIK REGAN, Macalester College, LUKE GRIMMELBEIN, Beloit College

TECTONIC EVOLUTION OF A DEEPLY EXHUMED ARC SECTION: A STUDY OF THE PHYSICAL AND PETROLOGIC EVOLUTION OF THE SALINIAN BLOCK, CENTRAL COASTAL CALIFORNIA:

Faculty: ALAN CHAPMAN, Macalester College and SARAH BROWNLEE, Wayne State University

Students: GRADY JOHNSON, Macalester College, ALISON HORST, Union College, VERONICA VRIESMAN, Colgate University, MOLLY KOVER, Smith College, ERICA WATTS, Mt. Holyoke College, EMILY GROSS, Macalester College.

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SUBFOSSIL ASSEMBLAGES AS INDICATORS OF ENVIRONMENTAL QUALITY IN TEMPERATE LAKES OF WISCONSIN:

Faculty: JILL LEONARD-PINGEL, Washington & Lee University, and ANDREW MICHELSON, University of Pittsburgh

Students: SEQUOYA BUA-LAM, Washington & Lee University, JOHN DANNEHL, Washington & Lee University, TAYLOR MOONEY, Colgate University, ALEXANDER WAHEED, Whitman College, SLOANE GARELICK, Oberlin College, ANDREW CONAWAY, The College of Wooster.

EVALUATING THE SLIP HISTORY OF CRUSTAL FAULTS UNDERLYING VICTORIA, BRITISH COLUMBIA: IMPLICATIONS FOR SEISMIC HAZARDS:

Faculty: KRISTIN MORELL, University of Victoria and TOM GARDNER, Trinity University

Students: BRENDAN POWERS, Trinity University, NOLAN LESCALLEET, Union College, CARLEE AKAM, University of Victoria, JOHN BORAH, Colorado College

THE ROLE OF BEAVER IN SEDIMENT AND CARBON BUDGETS OF THE ADIRONDACK MOUNTAINS, NY:

Faculty: MATTHEW JUNGERS, Washington and Lee University

Students: SARAH GRANKE, Pomona College, SHYAM DAS-TOKE, Whitman College, SPENCER O'BRYAN, Carleton College

CONSTRAINTS ON MAGMA TRANSPORT AND ERUPTION DYNAMICS AT A GLACIOVOLCANIC PILLOW RIDGE, SOUTHWEST ICELAND:

Faculty: MEAGEN POLLOCK, The College of Wooster, and BEN EDWARDS, Dickinson College

Students: MICHELLE ORDEN, Dickinson College, CHLOE WALLACE, The College of Wooster, CARA LEMBO, Amherst College, ANNA THOMPSON, Carleton College, RACHEL HEINEMAN, Oberlin College, CARI-LARS ENGEN, Beloit College

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Keck Geology Consortium: Projects 2016-2017
Short Contributions— Iceland Tephrastratigraphy Project

TEPHRASTRATIGRAPHY IN ICELAND

ANDREW DE WET, Franklin & Marshall College and CHRISTOPHER HAMILTON, University of Arizona

GEOMORPHOLOGIC MAP OF THE FISSURE 3 LAVA CHANNEL OF THE 1783-1784 LAKI ERUPTION, ICELAND

ALEXANDRA HUFF, Northern Arizona University

Research Advisor: James A. Skinner, Jr. U.S. Geological Survey

AN INVESTIGATION OF THE RELATIONSHIP BETWEEN ‘a‘ā AND SPINY PĀHOEHOE AT THE HOLUHRAUN LAVA FIELD IN ICELAND

JONATHAN MAGEE, Franklin & Marshall College

Research Advisor: Andrew deWet

EXAMINING THE EMPLACEMENT HISTORY OF A ROOTLESS CONE COMPLEX ASSOCIATED WITH THE LAKI VOLCANIC FIELD

ANNY SAINVIL, Smith College

Research Advisors: Mark Brandriss (Smith College), Robert Newton (Smith College)

RECONSTRUCTING JÖKULHLAUP DISCHARGE USING THE MORPHOLOGY OF ERODED VOLCANIC ROOTLESS CONES

KRYSTINA LINCOLN, Williams College

Research Advisor: Bud Wobus

USING PAHOEHOE CRUST GROWTH RATES TO CONSTRAIN LAVA CHANNEL FORMATION EVENTS AND TIMING

LUCAS ZELLER, Amherst College

Research Advisors: Andrew deWet (Franklin and Marshal College and Christopher Hamilton (University of Arizona)

IMPLICATIONS OF PAHOEHOE CRUSTAL THICKNESS DISTRIBUTION THE FISSURE 3 LAVA CHANNEL IN LAKI, ICELAND

WILLIAM SPEISER, Wesleyan University

Research Advisor: Christopher W. Hamilton (University of Arizona)

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Keck Geology Consortium: Projects 2016-2017
Short Contributions— Great Lakes Dendrochronology Project

DENDROCHONOLOGICAL ANALYSIS OF INSULAR FOREST STANDS IN RELATION TO CLIMATE AND WATER-LEVEL FLUCTUATIONS IN THE GREAT LAKES:

Faculty: KIM DIVER, Wesleyan University

A DENDROCHRONOLOGICAL RECORD OF TWENTIETH CENTURY WATER LEVELS IN GEORGIAN BAY, ONTARIO, CANADA

LEAH BOURNIVAL, Mt. Holyoke College

Research Advisor: Michelle Markley (Mt. Holyoke College)

A GIS APPROACH TO THE EFFECTS OF WATER-LEVEL CHANGE ON SOIL PROPERTIES AND TREE SPECIES RICHNESS

EZRA STEINFELD, Wesleyan University

Research Advisor: Kim Diver (Wesleyan University)

DENDROCHRONOLOGY AND WATER LEVELS AS INDICATORS OF RECENT CLIMATE CHANGE: GEORGIAN BAY, LAKE HURON (ONTARIO, CANADA)

MATTHEW KELLY, Beloit College

Research Advisor: Carl Mendelson (Beloit College)

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**Keck Geology Consortium: Projects 2016-2017
Short Contributions— Mollusk Ecology Project**

**HISTORICAL ECOLOGY OF MARINE MOLLUSKS IN THE NORTHERN GULF OF MEXICO:
INVESTIGATING ANTHROPOGENIC IMPACTS IN COASTAL ECOSYSTEMS THROUGH LIVE-
DEAD ANALYSIS:**

Faculty: PAUL HARNIK, Franklin & Marshall College.

**ASSESSING THE EFFECTS OF NUTRIENT RUNOFF ON BIVALVE EGG SIZE IN THE GULF OF
MEXICO**

MORGAN TORSTENSON, Franklin & Marshall College

Research Advisor: Paul G. Harnik, Franklin and Marshall College

**COMPARATIVE TAPHONOMY OF MOLLUSCAN DEATH ASSEMBLAGES FROM THE GULF OF
MEXICO**

ANIK REGAN, Macalester College

Research Advisor: Paul G. Harnik (Franklin and Marshall College)

**BIVALVE LIVE-DEAD DIFFERENCES RECORD THE IMPACT OF ANTHROPOGENIC
EUTROPHICATION ON COASTAL ECOSYSTEMS IN THE NORTHERN GULF OF MEXICO**

LUKE GRIMMELBEIN, Beloit College

Research Advisor: Paul G. Harnik (Franklin and Marshall College)

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Keck Geology Consortium: Projects 2016-2017
Short Contributions—Salinian Block Project

TECTONIC EVOLUTION OF A DEEPLY EXHUMED ARC SECTION: A STUDY OF THE PHYSICAL AND PETROLOGIC EVOLUTION OF THE SALINIAN BLOCK, CENTRAL COASTAL CALIFORNIA:
SALAN CHAPMAN, Macalester College and SARAH BROWNLEE, Wayne State University

GEOCHRONOLOGIC AND HAFNIUM ISOTOPIC CONSTRAINTS ON THE EVOLUTION OF THE SALINIAN MAGMATIC ARC
GRADY JOHNSON, Macalester College
Research Advisor: Alan Chapman (Macalester College)

RIM-CORE U-PB GEOCHRONOLOGY AND HF DATING OF DETRITAL ZIRCONS FROM THE SCHIST OF SIERRA DE SALINAS, CALIFORNIA
ALISON HORST, Union College
Research Advisor: Alan Chapman (Macalester College) and John Garver (Union College)

THE TECTONIC EVOLUTION OF A DEEPLY EXHUMED ARC SECTION: A PETROLOGICAL STUDY OF THE EMPLACEMENT OF THE SIERRA DE SALINAS SCHIST
VERONICA VRIESMAN, Colgate University
Research Advisor: Martin Wong (Colgate University)

EXHUMATION OF THE SCHIST OF SIERRA DE SALINAS
MOLLY KOVER, Smith College
Research Advisor: Jack Loveless (Smith College)

IMPLICATIONS OF PRE-CRETACEOUS MARBLES ALONG THE SUR FAULT ZONE, CALIFORNIA, USA: A STUDY OF CALCITE CRYSTALLOGRAPHIC PREFERRED ORIENTATIONS
ERICA WATTS, Mt. Holyoke College
Research Advisor: Michelle Markley (Mt. Holyoke College)

PRESERVATION OF A SUBDUCTION-RELATED GEOTHERMAL GRADIENT IN THE SCHIST OF SIERRA DE SALINAS, CENTRAL CALIFORNIA COAST RANGES
EMILY GROSS, Macalester College
Research Advisor: Alan Chapman (Macalester College)

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Keck Geology Consortium: Projects 2016-2017
Short Contributions—Wisconsin Lake Ecology Project

SUBFOSSIL ASSEMBLAGES AS INDICATORS OF ENVIRONMENTAL QUALITY IN TEMPERATE LAKES OF WISCONSIN:

JILL LEONARD-PINGEL, Washington & Lee University and ANDREW MICHELSON, University of Pittsburgh

DATING OF LACUSTRINE MOLLUSCAN SUBFOSSIL ASSEMBLAGES USING AAR TECHNIQUES TO CONTEXTUALIZE THE INTRODUCTION OF ZEBRA MUSSELS TO A WISCONSIN LAKE

SEQUOYA BUA-LAM, Washington & Lee University

RESEARCH ADVISOR: Jill Leonard-Pingel (Washington & Lee University)

ISOTOPIC ANALYSIS OF SEDIMENTS AS A PROXY FOR ENVIRONMENTAL QUALITY IN TEMPERATE LAKES OF WISCONSIN

JOHN DANNEHL, Washington & Lee University

Research Advisor: Jill Leonard-Pingel (Washington & Lee University)

A DIATOM-BASED, PALEOLIMNOLOGICAL STUDY OF SHADOW LAKE, WAUPACA COUNTY, WISCONSIN

TAYLOR MOONEY, Colgate University

Research Advisors: Jill Leonard-Pingel (Washington & Lee University), Andy Michelson (University of Pittsburgh), Amy Leventer (Colgate University) and Karen Harpp (Colgate University)

HEAVY METAL CONCENTRATIONS AND ENVIRONMENTAL QUALITY IN THREE WISCONSIN LAKES

ALEXANDER WAHEED, Whitman College

Research Advisor: Pat Spencer (Whitman College)

SUBFOSSIL OSTRACOD ASSEMBLAGES AS INDICATORS OF ENVIRONMENTAL QUALITY AND HUMAN IMPACT IN TEMPERATE LAKES OF WISCONSIN

SLOANE GARELICK, Oberlin College

Research Advisor: Jill Leonard-Pingel (Washington & Lee University) and Andrew Michelson (University of Pittsburgh)

MAGNETIC SUSCEPTIBILITY AS AN INDICATOR OF ANTHROPOGENIC ALTERATION TO THREE WISCONSIN LAKES

ANDREW CONAWAY, The College of Wooster.

Research Advisor: Jill Leonard-Pingel (Washington & Lee University) and Andrew Michelson (University of Pittsburgh)

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Keck Geology Consortium: Projects 2016-2017
Short Contributions—British Columbia Seismic Hazards Project

EVALUATING THE SLIP HISTORY OF CRUSTAL FAULTS UNDERLYING VICTORIA, BRITISH COLUMBIA: IMPLICATIONS FOR SEISMIC HAZARDS:

Faculty: KRISTIN MORELL, University of Victoria and TOM GARDNER, Trinity University

LATE PLEISTOCENE GLACIAL HISTORY AND EVALUATION OF THE SAN JUAN FAULT, SOUTHWESTERN VANCOUVER ISLAND, BRITISH COLUMBIA

BRENDAN POWERS, Trinity University

Research Advisor: Thomas Gardner (Trinity University)

THE SAN JUAN FAULT: AN EAST-WEST TRENDING LEFT-LATERAL STRIKE SLIP FAULT INFERRED FROM ANALYSIS OF KINEMATIC INDICATORS, VANCOUVER ISLAND, BC

NOLAN LESCALLEET, Union College

Research Advisor: Dr. Matthew Manon (Union College)

OLIGOCENE TO RECENT VERTICAL TECTONISM ON SOUTHWESTERN VANCOUVER ISLAND REVEALED BY ANALYSIS OF THE CARMANAH GROUP SEDIMENTARY UNITS

CARLEE AKAM, University of Victoria

Research Advisor: Dr. Kristin Morell

BRITTLE FAULT KINEMATICS OF THE SAN JUAN FAULT ZONE, SOUTHERN VANCOUVER ISLAND, BRITISH COLUMBIA

JOHN BORAH, Colorado College

Research Advisor: Meredith Bush (Colorado College)

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Keck Geology Consortium: Projects 2016-2017
Short Contributions—Beaver and Geomorphology Project

THE ROLE OF BEAVER IN SEDIMENT AND CARBON BUDGETS OF THE ADIRONDACK MOUNTAINS, NY:

Faculty: MATTHEW JUNGERS, Washington and Lee University

CHARACTERIZING BEAVER-INDUCED DIFFERENCES IN REACH-SCALE FLUVIAL MORPHOLOGY, HUNTINGTON WILDLIFE FOREST (HWF), CENTRAL ADIRONDACKS, NY

SARAH GRANKE, Pomona College

Research Advisor: Robert R. Gaines (Pomona College)

ANALYZING THE GEOMORPHIC PARAMETERS OF BEAVER-CREATED MEADOWS ALONG PANTHER BROOK, NY

SHYAM DAS-TOKE, Whitman College

Research Advisor: Lyman Persico (Whitman College)

BEAVER OCCUPATION AND SEDIMENT BUDGET: PANTHER BROOK, HUNTINGTON WILDLIFE FOREST, NEWCOMB, NY

SPENCER O'BRYAN, Carleton College

Research Advisor: Dr. Matthew Jungers (Washington and Lee University)

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Keck Geology Consortium: Projects 2016-2017 Short Contributions—Iceland Magma Project

CONSTRAINTS ON MAGMA TRANSPORT AND ERUPTION DYNAMICS AT A GLACIOVOLCANIC PILLOW RIDGE, SOUTHWEST ICELAND:

Faculty: MEAGEN POLLOCK, The College of Wooster, and BEN EDWARDS, Dickinson College

FRACTURE MECHANICS AND THERMODYNAMICS IN PILLOW LAVAS

MICHELLE ORDEN, Dickinson College

Research Advisor: Benjamin R. Edwards (Dickinson College)

PALEO-ICE THICKNESS OF A GLACIOVOLCANIC TINDAR RIDGE, REYKJANES PENINSULA, SOUTHWEST ICELAND

CHLOE WALLACE, The College of Wooster

Research Advisor: Meagen Pollock (The College of Wooster)

ERUPTIVE HISTORY OF TEPHRA ON UNDIRHLÍÐAR RIDGE, ICELAND

CARA LEMBO, Amherst College

Research Advisor: Jack Cheney (Amherst College)

VESICLE DISTRIBUTION IN GLACIOVOLCANIC PILLOW LAVA FROM UNDIRHLÍÐAR, SOUTHWEST ICELAND

ANNA THOMPSON, Carleton College

Research Advisor: Cameron Davidson (Carleton College)

GLACIOVOLCANIC MEGAPILLOWS OF UNDIRHLÍÐAR, REYKJANES PENINSULA, SOUTHWESTERN ICELAND

RACHEL HEINEMAN, Oberlin College

Research Advisor: Zeb Page (Oberlin College)

NEW INSIGHTS AND EDUCATIONAL TOOLS THROUGH STORY MAPPING OF A GLACIOVOLCANIC TINDAR

CARI-LARS ENGEN, Beloit College

Research Advisor: Susan Swanson (Beloit College)