

KECK GEOLOGY CONSORTIUM: 2011-2012

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

Amherst College, Amherst, MA, April 2012

Table of Contents

SOUTH-CENTRAL ALASKA PROJECT

**TECTONIC EVOLUTION OF THE CHUGACH-PRINCE WILLIAM TERRANE,
SOUTH-CENTRAL ALASKA** **p. 1-7**

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** **p. 8-16**

BENJAMIN M. CARLSON, Union College
Research Advisor: John I. Garver

**PALEOMAGNETISM OF THE KNIGHT ISLAND OPHIOLITE, PRINCE WILLIAM
SOUND, ALASKA** **p. 17-22**

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** **p. 23-32**

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** **p. 33-39**

EMILY JOHNSON, Whitman College
Research Advisor: Kirsten Nicolaysen

**GEOCHEMISTRY OF THE KNIGHT ISLAND OPHIOLITE AND CHENEGA ISLAND
VOLCANICS, PRINCE WILLIAM SOUND, ALASKA** **p. 40-47**

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 p. 48-53

SARAH J. OLIVAS, University of Texas at El Paso
Research Advisor: Diane I. Doser

ASCRAEUS MONS, MARS PROJECT

ORIGINS OF SINUOUS AND BRAIDED CHANNELS ON ASCRAEUS MONS, MARS

ANDREW DE WET, Franklin & Marshall College p. 54-60
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 p. 61-66

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 p. 67-73

ZACHARY SCHIERL, Whitman College
Research Advisor: Patrick Spencer

VOLCANIC OR FLUVIAL CHANNELS ON THE SOUTH-EAST RIFT APRON OF ASCRAEUS MONS p. 74-79

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

PERUVIAN GLACIERS PROJECT

TROPICAL HOLOCENE CLIMATIC INSIGHTS FROM RECORDS OF VARIABILITY IN ANDEAN PALEOGLACIERS p. 80-84

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 p. 85-91

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

GLACIAL LACUSTRINE RECORDS OF CLIMATE VARIATION IN THE TROPICAL PERUVIAN ANDES p. 92-95

SASHA ROTHENBERG, Union College
Research Advisor: Donald Rodbell

**HOLOCENE GLACIAL VARIABILITY RECORDED IN LAKE SEDIMENTS FROM
NEVADO HUAGURUNCHO, PERU** p. 96-102

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** p. 103-109

JESSICA TRÉANTON, Colorado College

Research Advisor: Donald T. Rodbell

TETON-ABSAROKA RANGES, WYOMING PROJECT

**EOCENE TECTONIC EVOLUTION OF THE TETON-ABSAROKA RANGES,
WYOMING** p. 110-112

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** p. 113-118

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** p. 119-122

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** p. 123-128

BENJAMIN KRAUSHAAR, Fort Lewis College

Research Advisor: John P. Craddock

**STRUCTURAL EVOLUTION OF THE EOCENE SOUTH FORK DETACHMENT,
PARK COUNTY, WYOMING** p. 129-134

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

p. 135-141

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

p. 142-148

Research Advisor: David H. Malone

FRONT RANGE, COLORADO PROJECT

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

DAVID P. DETHIER, Williams College

p. 149-154

WILL OUMMET, University of Connecticut

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

p. 155-163

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**

p. 164-170

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**

p. 171-179

JAMES N. WINKLER, University of Connecticut

Research Advisor: Will Ouimet

VIRGIN ISLANDS PROJECT

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

p. 180-186

DENNIS K. HUBBARD, Oberlin College

KARLA PARSONS-HUBBARD, Oberlin College

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

p. 187-194

WILLIAM MATTHEW BENSON, Washington and Lee University

Research Advisor: Lisa Greer

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

p. 195-199

CORNELIA CLARKE, Pomona College

Research Advisor: Robert Gaines

POST-BLEACHING ENCRUSTATION HABITS IN USVI CORAL REEFS
CLAIRE MCELROY, Otterbein University **p. 200-206**
Research Advisor: Halard Lescinsky

**DEPTH-RELATED PATTERNS OF ABUNDANCE, DISTRIBUTION, AND
CARBONATE PRODUCTION FOR MICROBORING ORGANISMS: ST. JOHN, US
VIRGIN ISLANDS** **p. 207-212**
CONOR NEAL, Franklin and Marshall College
Research Advisor: Roger Thomas

**DEPTH RELATED DISTRIBUTION AND ABUNDANCE OF MICROBORING
ORGANISMS: ST. JOHN, US VIRGIN ISLANDS** **p. 213-218**
JONATHAN ROGERS, University of Wisconsin - Oshkosh
Research Advisor: Eric Hiatt

**MACROBIOEROSION RATES OF IN-SITU CORAL COLONIES: ST. JOHN, U.S.
VIRGIN ISLANDS** **p. 219-225**
ELIZABETH WHITCHER, Oberlin College
Research Advisor: Dennis Hubbard

NORTHWESTERN ICELAND PROJECT

CRUSTAL MAGMATIC PROCESSES IN ICELAND'S OLDEST CENTRAL VOLCANO
BRENNAN JORDAN, University of South Dakota **p. 226-231**
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** **p. 232-237**
EMILY CARBONE, Smith College
Research Advisor: Mark Brandriss

**MAGMATIC PROCESSES OF THE HRAFNFJÖRÐUR CENTRAL VOLCANO,
NORTHWEST ICELAND** **p. 238-244**
KATHRYN KUMAMOTO, Williams College
Research Advisor: Reinhard Wobus

**A GEOCHEMICAL AND PETROLOGIC ANALYSIS OF THE HRAFNFJORDUR
CENTRAL VOLCANO, WESTFJORDS, ICELAND** **p. 245-249**
KATHARINE SCHLEICH, The College of Wooster
Research Advisor: Meagen Pollock

ORIGIN OF SILICIC VOLCANISM AT SAURATINDUR, NORTHWEST ICELAND
THAD STODDARD, University of South Dakota **p. 250-255**
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

p. 256-261

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

p. 262-267

CONNECTICUT RIVER PROJECT

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

SUZANNE O'CONNELL, Wesleyan University

p. 268-275

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

TIRZAH ABBOT, Beloit College
Research Advisor: Carl Mendelson

p. 276-280

GEOCHEMICAL CHARACTERIZATION OF TIDAL COVES OF THE CONNECTICUT RIVER ESTUARY

HANNAH BLATCHFORD, Beloit College
Research Advisor: Carl Mendelson

p. 281-286

VARIABILITY OF SUSPENDED-SEDIMENT DISTRIBUTION IN THE CONNECTICUT RIVER ESTUARY

MICHAEL CUTLER, Boston College
Research Advisor: Gail Kineke

p. 287-293

RECONSTRUCTING ENVIRONMENTAL CHANGES IN THE LOWER CONNECTICUT RIVER USING DIATOMS

ELIZABETH JEAN GEORGE, Washington and Lee University
Research Advisor: David J. Harbor

p. 294-300

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

DANIELLE MARTIN, Wesleyan University
Research Advisor: Suzanne O'Connell

p. 301-304

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

JONATHAN SCHNEYER, University of Massachusetts Amherst

p. 305-309

Research Advisor: Jon Woodruff

GRENVILLE PROVINCE, ONTARIO PROJECT

PETROLOGY AND STRUCTURE OF THE CENTRAL METASEDIMENTARY BELT BOUNDARY THRUST ZONE ITS HANGING WALL, GRENVILLE PROVINCE, ONTARIO p. 310-315

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 p. 316-323

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 p. 324-330

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 p. 331-337

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

HETEROGENEOUS DEFORMATION OF GABBROIC ROCKS p. 338-343

CALVIN MAKO, University of Maine
Research Advisor: Christopher Gerbi

PETROLOGY AND GEOCHEMISTRY OF THE ALLSAW ANORTHOSITE: A SCAPOLITIZED META-ANORTHOSITE IN GRENVILLE PROVINCE, ONTARIO p. 344-351

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 p. 352-355

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 p. 356-261

BO MONTANYE, Colgate University

Research Advisor: William H. Peck

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

p. 262-268

JACQUELYNE NESBIT, Princeton University

Research Advisor: Blair Schoene

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

p. 269-374

CALIE SENDEK, Scripps College

Research Advisor: Linda Reinen