The successful use of GeoCorps & geoscience teacher interns to further geologic research at Mount Rainier National Park, WA, USA

Scott R. Beason, Paul M. Kennard & Laura C. Walkup
Program Background

Background

Successful Projects

Summary
GeoCorps/Geoscientists-in-the-Parks

- Offers short-term (12-week) paid geoscience positions at National Parks, Forests and BLM lands
- Stipend varies, but generally ~ $3,000
- Housing paid by host park
- Also offer Guest Scientist positions
- Classified as volunteers by parks
- Extremely competitive program
Program designed to increase diversity among those who seek STEM careers within the National Park Service

Stipend varies, but generally $4,000

Housing paid by host park

Career workshop in DC included

Classified as volunteers by parks

Extremely competitive program
Geoscience Teachers-in-Parks

• Program developed by the National Association of Geoscience Teachers (NAGT)
• Offers geoscience teachers 8-week paid internships in parks (Stipend ~ $3,000)
• Initially started at Mammoth Caves, offered at Mount Rainier since 2011
• Classified as volunteers by parks
• Housing paid by host park
Divisions & Responsibilities

Natural & Cultural Resources

- Work with park and outside researchers assisting with studies on landscape response to climate change
- Assist with research on alpine lakes and other aquatic habitat
- Document floods, debris flows, rock falls, and other geologic events as they occur

Interpretation
Divisions & Responsibilities

Natural & Cultural Resources

• Work with park and outside researchers assisting with studies on landscape response to climate change
• Assist with research on alpine lakes and other aquatic habitat
• Document floods, debris flows, rock falls, and other geologic events as they occur

Interpretation

• Staff front-line visitor centers at Longmire, Paradise, Sunrise, and Ohanapecosh
• Offer ranger-led interpretive hikes and programs
• Offer illustrated evening programs
• Offer Junior Ranger programs
GeoCorps and Geoscience Teacher Internships

RESULTS AT MORA
### GIP/GTIP/TRT Numbers at MORA

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**Key:**

- **NCR**
  Natural and Cultural Resources Division
- **INTERP**
  Interpretation Division
- **GIP**
  Geologist-in-Park
- **GTIP**
  Geoscience-Teacher-In-Park
- **TRT**
  Teacher-Ranger-Teacher

Data as of October 2014
Recent successful geology projects at Mount Rainier

SUCCESSFUL STORIES
2011/12 Glacier Survey

2011 GIP Laura Walkup (left)
2012 GIP Jenna Zechmann (right)

Photo: Paul Kennard
Results

2011

2012

Glacier Velocity

Rate (mm/day)

0 - 75
75 - 150
150 - 225
225 - 300
300 - 375
375 - 450
450 - 525
525 - 600
600 - 675
675 - 750

Study Area
Results

Velocity Fields (2011 and 2012, mm)

- High: 800
- Low: 0
- Velocity Contours (Cl = 60 mm)
- Study Area

2012 - 2011 Change (mm)

- < -120
- -120 - -60
- -60 - -30
- 30 - 60
- 60 - 120
- >120
- No Change
Outburst Flood

October 27, 2012
Approx. 1 m rise in stream stage

Scott Beason

2011 GIP Laura Walkup
Products

Poster at 2013 GSA Meeting:

SURFICIAL ICE VELOCITIES OF THE LOWER NISQUALLY GLACIER AND THEIR RELATIONSHIP TO OUTBURST FLOOD HAZARDS AT MOUNT RAINIER NATIONAL PARK, WASHINGTON, UNITED STATES

WINCHEL, Laura C.; BEASLING, Scott R.; KIRCHER, Paul M.; CHESNUT, Justin G.; and STIFTER, Anna C.

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I. ABSTRACT

II. LOCATION

III. BACKGROUND

IV. HISTORIC OUTBURST FLOODS

V. METHODS

VI. NISQUALLY GLACIAL VELOCITY RESULTS

VII. FALL 2012 GLACIAL OUTBURST FLOOD

VIII. OUTCOMES

2014 Geological Society of America Annual Meeting

Monday, October 20, 2014

Vancouver, BC, Canada
Forthcoming NRDS Paper:

Poster at 2013 GSA Meeting:

Surficial Velocities of the Nisqually Glacier, Mount Rainier National Park, 2011 and 2012

Natural Resource Data Series NPS-XXXX/NRDS--20XXXX
Glacier Mapping

2012 GIP Jenna Zechmann
Periglacial land cover at the termini of the Tahoma and South Tahoma glaciers

Feature type
- Bedrock
- Scree
- Outwash/Alluvium
- Channel
- Moraine
- Moraine, end
- Moraine, oversteep
- Moraine, ice cored
- Moraine, possibly ice cored
- Moraine, rock cored
- Rills

Glacial ice type
- Active
- Stagnant

Map created in 2012 by Jenna Zechmann based on data from 2007 and 2008 LIDAR flights, 2007 and 2011 NAIP imagery, and 2012 ground-based photographs, field observations, and GPS data.

Glacier extents created by Tom Sisson using 2007 and 2008 LIDAR data, and modified by Jenna Zechmann to reflect 2012 extents determined from GPS survey and field observations.
Aggradation Studies

2012 GIP Anna Stifter
Photo: Scott Beason

2012 GIP Corrie Floyd
Photo: Scott Beason

2011 GIP Laura Walkup
Photo: Anna Stifter
Aggradation Study Products

Natural Resource Technical Report: (Will be published this week!)

Fluvial landscape response to aggradation, debris flows, and landslides: An example from the Nisqually River and Van Trump Creek, Mount Rainier, Washington, USA

BEASON, Scott, et al.
**Discharge Measurements**

2013 GTIP Amy Rutz (left)
2013 GTIP Greg Stott (right)

2012 GTIP William Baur

Photos: Scott Beason
Discharge Measurement Products

Water Data Reports (all in review)
Mt. Wow Rock Fall
Mt. Wow
Rock Fall

2011 GIP Laura Walkup

2014 GIP John Russell

2014 GIP John Russell

All Photos: Scott Beason
Future of the West Side Road

Background

Results

Successful Projects

Summary

2014 GIP Matt Thomas

Photo: Theresa Schwartz
Leveraging anecdotal, topographic, and hydrologic insights to identify challenges in managing the Westside Road, Mount Rainier National Park, Washington State

**Intern**
Matthew A. Thomas, GeoCorps / GIP - Geomorphology Technician (#2014049)

**Supervisor**
Paul Kennard, Regional Geomorphologist

**Project Timeline**

Presented to Mount Rainier Management Team
Carbon River: “War of the Woods”

2013 GIP Rebecca Rossi

Photo: John Beyeler

2013 GIP Rebecca Rossi (Left)
2013 GIP John Beyeler (Right)

Photo: Dean Koepfler, The News Tribune
Extreme river response to climate-induced aggradation in a forested, montane basin, Carbon River, Mount Rainier National Park, Washington, United States

Jonathan Beyeler, Rebecca Rossi, Paul Kennard, Scott Beason
Mount Rainier National Park, Ashford, WA, United States

Presented at the 2013 AGU Fall Meeting
Monitoring mountain lakes at Mount Rainier National Park and the North Coast and Cascades Network

GOODMAN, Arianna, et al.

I speak geology: A summer as an interpretive specialist at Mount Rainier National Park

GROSS, Benjamin M.
Is the program worth it?

SUMMARY
Is the program worth it? 

SUMMARY

2008 GIP Justin Ohlschlager (left) 
Kate Allstadt (center) 
2011 GIP Laura Walkup (right)
Advantages

• Cost effective for all agencies
• Excellent experience for interns
• Easy to post a position
• The park gets highly motivated and eager-to-learn interns
• Able to select the best match for the job
• Interns contribute to scientific research
Disadvantages

• Very few disadvantages!
• Short time frame (8-12 weeks vs. 26 weeks for seasonal employees) – Mosaics and GTIPs can work longer (up to 1 year)
• Wide range of skills (undergrad through post-doc) – Not completely a bad thing!
Acknowledgements

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• **NCR GIPs**: Anna Stifter, Arianna Goodman, Bree McClennning Gonzalez, Corrie Floyd, Elizabeth Beaulieu, Erin Tainier, Holly Brunkal, Jenna Zechmann, John Beyeler, John Russell, Justin Ohlschlager, Matt Thomas, Rebecca Rossi, and Sabrina Belknap.

• **NCR GTIPs**: Adam King, Amy Rutz, Erol Kavountzis, Gayle Eisner, Greg Stott, and William Baur.

• **Interpretation GIPs**: Alisa Scott, Amishi Kumar, Andrew Walters, Aurora Pinkney-Drobnis, Becca Walker, Bob Lillie, Brian Dempsey, Brian McDonald, Brittina Argow, Carrie Brugger, Charles Trexler, Chelsea Neill, Christina Carr, Christina Gooch, Colleen Riley, Conor McDowell, Dana Smith, Delenora Grey, Elena Sipe, Eric McPherren, Erin Smith, Heather Parker, Hillary Sletten, Jason Hanson, Jeff Gross, Justin Hynicka, Karinne Knutsen, Karrie Karpinski, Kristen Borseth, Lauren Schaefer, Lindsey Doermann, Louis Bodin, Maaria Thompson, Mariah Doll, Marissa Reis, Matt Swanson, Megan Killeen, Nicole Kneprprath, Nicole Rutters, Nora-Rose Hencir, Rachel Landmann, and Tammi Corchero.

• **Interpretation TRTs**: Denise Thompson, Don Borst, Everett Hill, Jeffrey Johnson, Kevin Olson, Kirsten Anderson, Laura Barnhardt, Loni Cantu, Matthew Phillipy, Maureen McLean, Nicole Uhre, Paul Tankovich, Peter Conrick, Sarah Illingworth, Scott McLean, Shonna Seigers, and Susan O’Leary.

• Many, many more!
Thank You!

2012 GIP Jenna Zechmann (left) & Steve Wilson (right)