Theodore B. Barnhart

Curriculum Vitae

Institute of Arctic and Alpine Research
University of Colorado
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Research Interests

I am interested in how surface processes respond to changes in environmental drivers, hillslope hydrology, snow hydrology, fluvial geomorphology, and applications of terrestrial laser scanning and remote sensing to problems in these and other areas.

Education

► Ph.D. Geography (Terrestrial Hydrology), University of Colorado, (in progress).

Advisor: Noah Molotch Ph.D.

► M.S. Geology, Idaho State University, 2013, GPA: 3.96.

Thesis: Morphodynamics of the Selawik Retrogressive Thaw Slump, Northwest Alaska.

Advisor: Benjamin Crosby Ph.D.

► B.A. Geology-Environmental Studies with Honors, Whitman College, 2010, GPA: 3.7 *Cum Laude*.

Honors Thesis: Glaciomarine Sediment Flux and Transportation Mechanisms, Kronerbreen/Kongsvegan, Kongsfjorden, Svalbard.

Advisors: Robert Carson Ph.D. and Nicholas Bader Ph.D.

Work Experience

University of Colorado | Boulder, CO | Teaching Assistant | Fall 2013 - present

Idaho State University | Pocatello, ID | Research Assistant | Summer 2011 - Spring 2013

The Sonoran Institute | Bozeman, MT | Geology and GIS Research Volunteer | Winter-Spring 2011

Whitman College | Walla Walla, WA | Semester in the West Technical Manager | Fall 2010

Bryce Canyon National Park | Bryce Canyon, UT | GSA GeoCorps Geology Intern | Summer 2010

Los Alamos National Laboratory | Los Alamos, NM | Water Quality Intern | Summer 2008

Research Experience

Geomorphology and Evolution of a Retrogressive Thaw Slump, Selawik River, Alaska, Summer 2011 & 2012

- Use a terrestrial laser scanner to quantify landform growth and complex surface change.
- Maintain interval cameras, a meteorology station, and hydrology sensors in the field.
- Work effectively in a remote backcountry setting.

Bridge Fire Erosion Study, Bryce Canyon National Park, Summer 2010

- Assess and map erosion severity from a wildfire that came through the Park during the summer of 2009.
- Develop an erosion model for the Park to assist land managers with mitigation decisions.
- Design and build a long term erosion monitoring project to be implemented in the Park.

NSF Research Experience for Undergraduates, Svalbard, Norway, Summer 2009

- Design and implement a glaciomarine sedimentology research project.
- Work effectively with other undergraduate researchers and guiding faculty in the challenging Arctic environment.

- Collect sediment trap samples, gravity cores, and CDT+OBS casts from small boats within 2 km of the terminus of a tidewater glacier.
- Use an SEM to analyze sediment samples and process the results using R.
- Finalize the research at Whitman College as a Geology-Environmental Studies Honors Thesis.

Idaho State University Geology Field Camp, Summer 2009

- Competently map a variety of geologic features.
- Collect structural data in the field using a Brunton pocket transit.
- Collect digital geospacial data in the field using ESRI ArcPad on a survey grade GPS unit.
- Create digital geologic maps in ESRI ArcMap and Adobe Illustrator.
- Plot and analyze structural data using Stereonet 6.3.3.

Wetland Restoration, San Bernardino Ciénaga, Sonora, Mexico, Spring 2009

- Analyze wetland vegetation data gathered on Whitman College's Semester in the West as a proxy for the success of a wetland restoration project.
- Plot and analyze wetland vegetation data in ESRI ArcGIS.

Whitman College Semester in the West, Fall 2008

- Collect ecology, fluvial geomorphology, and surface hydrology data in the field.
- Collect data on aspen and willow browse in the field to generate brief reports for rangeland conservation management.

Publications

Barnhart, T.B., B.T. Crosby, D.R. Derryberry, and J.C. Rowland (in prep.), Controls on Interstitial Ice Dominated Retrogressive Thaw Slump Retreat Rate and Form, Selawik Retrogressive Thaw Slump, Alaska, Permafrost and Periglacial Processes.

Barnhart, T.B. and B.T. Crosby (2013), Comparing Two Methods of Surface Change Detection on an Evolving Thermokarst Using High-Temporal-Frequency Terrestrial Laser Scanning, Selawik River, Alaska, Remote Sensing, 5(6), 2813-2837, doi:10.3390/rs5062813.

Oral Presentations

Barnhart, T.B. and B.T. Crosby (2011), Using High Frequency Terrestrial LiDAR to Correlate Meteorological and Hydrological Drivers to the Expansion of a Retrogressive Thaw Slump along the Selawik River, Alaska, Abstract C52A-05, presented at the 2011 Fall Meeting, AGU, San Francisco, Calif., 5-9 Dec.

Poster Presentations

Barnhart, T.B., B.T. Crosby, D.R. Derryberry, and J.C. Rowland (in review), Using High-temporal-resolution, Repeat Terrestrial LiDAR to Compare Topographic Change Detection Methods and to Elucidate the Hydrometeorologic Controls on the Retreat Rate and Form of the Selawik Retrogressive Thaw Slump, Northwest Alaska, Control ID: 1785014, to be presented at the 2013 Fall Meeting, AGU, San Francisco, Calif., 9-13 Dec.

Barnhart, T.B., B.T. Crosby, J.C. Rowland, and D.C. Finnegan (2012), High-Frequency Terrestrial LiDAR Scanning Reveals Connections between Environmental Drivers and Thaw Slump Headwall Retreat Rate and Form, Selawik River, Alaska, Abstract EP31C-0827, presented at the 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.

Barnhart, T.B., R. Powell, J. Brigham-Grette, R.J. Carson, P. Spencer, N.E. Bader, and K. Nicolaysen (2010), Glaciomarine Sediment Flux and Transportation Mechanisms, Kongsbreen, Kongsfjorden, Svalbard, presented at the 40th Annual International Arctic Workshop hosted by INSTAAR, Winter Park, Colo., 10-12 Mar.

Barnhart, T.B., N.E. Bader, P. Arbetan, P. Brick (2009), Restoring a Ciénaga: Monitoring Groundwater Levels Through Changes in Vegetation, presented at the Murdock College Science Research Conference, Spokane, Wash., 29-31 Oct.

Community Activities

Meeting Sessions

Anderson, R.S., K.R. Barnhart, B.T. Crosby, and T.B. Barnhart (2012), Thermal Control on Weathering, Erosion and Landscape Evolution, Session EP035, convened at the 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.

Service, Honors, Internships, Memberships, and Certifications

Idaho State University Geology Club: President, Fall 2012-Spring 2013

The Spatial and Temporal Influences of Thermokarst Features on surface Processes in Arctic Landscapes Research Assistantship, Idaho State University 2012

The Spatial and Temporal Influences of Thermokarst Features on surface Processes in Arctic Landscapes Research Assistantship, Idaho State University 2011

Leeds Prize for Excellence in Geology, Whitman College 2010

Geological Society of America GeoCorps Fellowship Bryce Canyon National Park 2010

Los Alamos National Lab Student Internship, Water Quality, 2008

Geological Society of America, 2009-present

American Geophysical Union, 2009-present

WMI of NOLS Wilderness First Responder, exp. 2013

Technical Skills

Scientific computing: MATLAB, R, Python.

LiDAR processing and analysis: Riscan Pro, I-Site Studio, M3C2, Cloud Compare, LAStools, ENVI.

Mapping and spatial analysis: ESRI ArcGIS (ArcMap, ArcToolbox, ArcCatalogue, ArcPad).

Updated: August 5, 2013