



## JOANNA YOUNG

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### Research Interests

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Estimating glacier mass loss in a changing climate and resulting contributions to sea level rise; synthesizing ground, airborne and satellite data to connect disparate glaciological methods; understanding downstream effects of glacier change on freshwater availability for terrestrial and aquatic ecosystems; climate change communication, environmental outreach, and STEM education.

### Education

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University of Alaska Fairbanks, USA *March 2014 – Present*

Ph.D. student in Geophysics – co-advisors: Dr. Anthony Arendt & Dr. Erin Pettit

*Current topic – Estimating Alaska glacier mass loss and resulting sea level rise using satellite & field data*

University of Alaska Fairbanks, USA *Jan. 2010 – Dec. 2013*

M.S. in Geophysics – advisor: Dr. Anthony Arendt

*Thesis – Temperature index modeling of the Kahiltna Glacier: Comparison to multiple field and geodetic mass balance datasets*

University of British Columbia, Vancouver, Canada *Sept. 2003 – April 2008*

B.S. in Physics/Astronomy

B.A. in Philosophy of Science

### Work Experience

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University of Alaska Fairbanks – Geophysical Institute *Jan. 2010 – Present*

- Research assistant with the Glaciers group – advisors: Dr. Erin Pettit & Anthony Arendt

University of Alaska Fairbanks – Girls on Ice Alaska *July 2011 – Present*

- Program lead and instructor for wilderness science outreach program – advisor: Dr. Erin Pettit

University of Calgary (Alberta, Canada) *June – Dec. 2008*

- Field assistant with the Climate & Cryosphere group – advisor: Dr. Shawn Marshall
- Research assistant with the Atmospheric Physics group – advisor: Dr. Ann-Lise Norman

### Glaciology & Field Experience

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- *Juneau Icefield – April 2013 to present:* Designed and led a field team in the helicopter- and snowmobile-supported deployment of a mass balance and weather station network on the Gilkey Glacier in Southeast Alaska, to help derive glacier mass loss from satellite and field data.
- *Gulkana Glacier, Eastern Alaska Range – June 2012, 2013 and 2014:* Guided a team of 9 teenaged girls on 8-day science expeditions to a remote Alaska glacier to learn about ice, climate change, mountaineering, and leadership, through the Girls on Ice Alaska program.
- *Eastern Alaska Range – April 2012:* Led the design and field deployment of a mass balance and weather station network on four glaciers in central Alaska. Project informed the feasibility of the high-profile (and now-discontinued) Susitna River hydroelectric dam project.
- *Kahiltna Glacier, Central Alaska Range – 2010/2011:* Led a field team on multiple ski-based expeditions to collect field data for quantifying recent glacier loss in Denali National Park.

- *Other (Alaska) – 2010/2011/2012*: Invited assistant for various coastal and interior glacier studies throughout Alaska (mass balance, ice thickness, and debris-cover studies).
- *Kananaskis, Alberta, Canada – 2008*: Assisted in accessing/maintaining a grid of backcountry meteorological stations monitoring climate conditions in the foothills of the Canadian Rockies.

### **Outreach & Climate Change Communication**

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- Program lead for **Girls on Ice Alaska** (<http://girlsonice.org>), a free wilderness science program for underserved high school girls, soon to be featured in the January 2017 National Geographic magazine. Participants learn about glaciers, climate change and the alpine landscape through scientific field studies on a 12-day expedition on an Alaskan glacier. The Alaskan version of Girls on Ice (a sister program to the original Washington version) was created, developed and launched in 2012 by a three-member graduate student team including myself. Responsibilities include publicity and outreach, curriculum development, expedition logistics, and ~\$25,000 in grant fundraising each year. Girls on Ice Alaska hosted its fifth expedition in June, 2016.
- In Dec 2016, I will be one of 78 participants selected for **Homeward Bound** (<http://homewardboundprojects.com.au>), a leadership program and expedition in Antarctica for female scientists from around the world. This initiative will feature faculty including Dr. Jane Goodall and Dr. Sylvia Earle, and will be documented in a film by Bunya Productions. Homeward Bound has been receiving significant press, with articles in Marie Claire and Forbes (<http://goo.gl/2FfmWE>) magazines, in which I am featured.
- Film experience: scientist in the upcoming National Geographic IMAX documentary film **Extreme Weather** (<http://movies.nationalgeographic.com/movies/extreme-weather/>), for release in October 2016. I was also a scientist filmed for **Abenteuer Alaska**, a German documentary (<http://goo.gl/CLSVcz>) which debuted in Germany in Jan. 2014 to a viewership of 8 million people. I was also interviewed for a Canadian national news broadcast (CBC's **The National**) on glacier change in Alaska (<http://goo.gl/2cYVI8>).
- Participating scientist in CryoConn 2013, a professional development program for Alaska middle-school teachers. During the three-day program, teachers gather tools and ideas for teaching students about vital connections between the Earth's frozen regions and life systems.
- Public lecture for Evening Speaker Series at Denali National Park, July, 2011. Title: *Assessing the effects of changing climate on Denali Park glaciers using field and satellite observations.*

### **Awards for Academic Achievement**

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- Kevin Engle Memorial Scholarship (**\$1000**), for students with demonstrated success working with satellite data. Feb. 2016.
- Excellence in Geographic Information Systems Scholarship (**\$1000**), for students undertaking spatial data analysis. July 2015.
- Friends of the University Women's Association Scholarship (**\$2000**), in recognition of service benefiting the university community. April 2015.
- Outstanding Student Presentation Award – Cryosphere division of the American Geophysical Union (AGU) Annual Fall Meeting, San Francisco, CA, USA, Dec. 2014.
- University of Alaska Fairbanks Geophysical Institute Outstanding Student Award. Feb. 2014.
- UAF Zelenka Award (**\$1,000**), for dedicated graduate students in geophysics. May 2013.
- UAF Belon 2012 Scholarship (**\$4,455**), awarded to outstanding graduate students in geophysics or physics. July 2012.

### **Funded Proposals**

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- Co-Investigator: Alaska Climate Science Center funding (**\$23,003** in 2012, **\$18,000** in 2013, **\$18,000** in 2014, **\$7,500** in 2016), awarded to the Girls on Ice Alaska program (see Education & Outreach Activities) for STEM education for young women. April 2012, Feb. 2013, and Feb. 2014.
- Co-Investigator: Charlotte Martin Foundation funding (**\$25,800** in 2016) awarded to Girls on Ice Alaska
- Co-Investigator: UAF College of Natural Science and Mathematics grant (**\$2,500** each year), awarded to the Girls on Ice Alaska program. Feb. 2012, Feb. 2013, and April 2014.

- Co-Investigator: The North Face Explore Fund (**\$2,500**), awarded to the Girls on Ice Alaska program. Nov. 2011.
- Principal Investigator: UAF Center for Global Change grant (**\$6,932**), for expanding observations on an Alaska glacier to include a high-mountain network. April 2011.
- Principal Investigator: George Melendez Wright Climate Change Fellowship (**\$17,240**), for a field-based study on the effects of climate change on a Denali National Park glacier. May 2010.

#### Peer-reviewed Publications

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- Gusmeroli, A., Arendt, A. A., Atwood, D. K., Kampes, B., Sanford, M. and **Young, J.** (2013). Variable penetration depth of interferometric synthetic aperture radar signals on Alaska glaciers: a cold surface layer hypothesis. *Annals of Glaciology*, 54(64), pp. 218-223.

#### Other Publications

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- **Young, J.**, and Arendt, A. A. (2014). *Assessing the effects of changing climate on the Kahiltna Glacier using field, airborne, and satellite observations*. Alaska Park Science, 12(2), pp. 26-31.
- **Young, J.**, Arendt, A. A., and Hulth, J. (2011). *Notes on automated weather station measurements on the Kahiltna Glacier, Central Alaska Range, and a simple floating temperature stand design*. In Workshop on the Use of Automatic Measuring Systems on Glaciers: Extended Abstracts, IASC Workshop, March 2011, Pontresina, Switzerland.

#### Selected Presentations

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- *Spatially Distributing a GRACE Mascon Solution Across Gulf of Alaska Glaciers*. (**Oral presentation; Outstanding Student Presentation Award for Cryosphere Division**). Annual Geophysical Union (AGU) Fall Meeting, San Francisco, CA, Dec. 2014.
- *Comparing and combining glacier mass balance methods at the basin scale in Alaska*. (**Poster**). AGU Fall Meeting, San Francisco, CA, Dec. 2013.
- *Temperature index modeling of the Kahiltna Glacier, and comparison to multiple field and geodetic mass balance datasets*. (**Poster**). Workshop on the Use of Wireless Sensor Networks, Kananaskis, AB, Canada, Aug. 2013.
- *Mass balance modeling of a large glacier with sparse ground observations, and comparison to three remote sensing techniques*. (**Poster; Award for Best Environmental Science Presentation**). National Meeting of the Experimental Program to Stimulate Competitive Research, Nashville, TN, Nov. 2013.
- *Modeling the mass balance evolution of the Kahiltna Glacier, Central Alaska Range, using sparse ground observations*. (**Poster**). International Glaciological Society Symposium, Fairbanks, AK, June 2012.
- *Assessing glacier response to changing climate using new and historical field observations on the Kahiltna Glacier in the Central Alaska Range*. (**Oral presentation**). AGU Fall Meeting, San Francisco, CA, Dec. 2011.
- *Automatic weather station measurements on the Kahiltna Glacier, Central Alaska Range, USA*. (**Oral presentation**). Workshop on the Use of Automatic Measuring Systems on Glaciers, Pontresina, Switzerland, March 2011.
- *Effects of changing climate on Central Alaska Range glaciers: a case study on the Kahiltna Glacier*. (**Poster**). AGU Fall Meeting, San Francisco, CA, Dec. 2010.
- *Mass balance and meteorological field measurements on the Kahiltna Glacier, 2010*. (**Oral presentation**). Northwest Glaciologists' Meeting, Fairbanks, AK, Oct. 2010.

#### Professional Organizations

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- Association for Women in Science (since 2012)
- Earth Science Women's Network (since 2012)
- Association of Polar Early Career Scientists (since 2012)
- American Geophysical Union (since 2010)
- Geophysical Institute Graduate Student Association (President in 2013; member since 2010)

## **Other Training**

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- Selected for Northwest Climate Science Center 'Climate Boot Camp' week-long workshop for climate scientists interfacing between academia, policy, and resource management. Aug., 2015.
- EdX online course – 'Understanding Climate Change Denial.' June, 2015.
- National Science Foundation 'Science Messenger' workshops on science communication, July, 2013 and Nov., 2013. Selected to represent Alaska in 'Science Messenger Idol' competition.
- Dec. 2012: Workshop on climate change literacy, AGU Fall Meeting, San Francisco, CA.
- May 2012/May 2015: Wilderness First Responder & CPR certifications (Wilderness Medical Associates).
- March 2016: AIARE Avalanche Level I certification.
- Feb. 2010/2011: Arctic land survival, underwater helicopter egress, and helicopter & fixed-wing air travel safety workshops.

## **Additional Miscellaneous/Personal Tidbits**

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- In Jan/Feb of 2014, I was fortunate to cycle a 1500-km gravel route through remote Chilean & Argentine Patagonia, one of the most enjoyable adventures of my life.
- In 2008, I backpacked (mostly) solo through the Middle East for a year, an unbelievably rewarding and challenging experience.
- I am also fluent in French, half-decent at trail marathons, & aspiring to do a 100-mile Interior Alaska ski race one day!