Anthony Arendt

Postdoctoral Fellow
Cryospheric Sciences Branch
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Date of Birth: June 21, 1972
Nationality: Canadian

Education

Ph.D., Geophysics Aug 2000 – May 2006; GPA: 3.87/4.00
University of Alaska, Fairbanks, USA.
"Volume changes of Alaska Glaciers: Contributions to Rising Sea Level and Links to Changing Climate."
Advisor: Keith Echelmeyer

M.S., Earth and Atmospheric Sciences 1995 – 1997; GPA: 8.67/9.00
University of Alberta, Edmonton, Canada.
"Approaches to Modelling the Mass Balance of High Arctic Glaciers."
Advisor: Martin Sharp

B.S., Earth and Atmospheric Sciences 1990 – 1995;
University of Alberta, Edmonton, Canada.
"A comparison of melt energy computations and surface lowering rates of a late-lying alpine snowpatch in the western Mackenzie Mountains, N.W.T."
Advisor: Martin Sharp

Research and Experience

NASA Postdoctoral Fellow, Oak Ridge Associated Universities
Goddard Space Flight Center
Greenbelt, MD
October 2006 – present

Calculating the mass balance of mountain glaciers using data from the Gravity Recovery and Climate Experiment (GRACE) satellites and aircraft laser altimetry.

Research Assistant/PhD Student, Geophysical Institute
University of Alaska
Fairbanks, AK
August 2000 – August 2006

Calculated the contribution of Alaska glaciers to rising sea level using aircraft altimetry data, and investigated climate patterns driving the mass changes. Developed and tested methods for extrapolating altimetry measurements. Designed GIS-based methods for processing laser altimetry data. Main administrator of altimetry project computer and database systems.

Climate Data Technician, Soil, Water and Climate Group
Alberta Agriculture, Food and Rural Development
Edmonton, AB
January 1999 – July 2000

Maintained climate database and filled requests for climate information and summaries. Conducted research on agricultural composting and carbon budgets.

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Research Assistant, **University of Alberta**
Glaciology Group **Edmonton, AB**
Summer 1995 and Oct 1997 – Oct 1998

Developed mass balance simulation models for glaciers in the Canadian Arctic archipelago. Analyzed patterns in local and regional scale Arctic climate.

Field Assistant, **University of Alberta**
Glaciology Group **Edmonton, AB**
Summer 1994 and Spring 1998

Conducted ice motion and ice depth surveys, retrieved shallow ice cores, and collected mass balance, meteorological and hydrochemical data from John Evans Glacier, Ellesmere Island, Canada.

Field Assistant, **University of Alberta**
Biogeography Group **Edmonton, AB**
Summer 1993

Monitored wildlife behavior and mapped vegetation patterns in the Mackenzie Mountains, Canada. Deployed climate monitoring stations over high elevation snowpack for honors thesis project.

Database Developer **Telus Communications**
Edmonton, AB
Summer 1990

Developed databases to manage computer networking protocols.

Technical Skills

- Experienced airborne altimetry technician. Trained in static, kinematic and differentially corrected GPS data collection and processing.
- Knowledge of geodatabase design and implementation in ArcGIS, relational database design and management in SAS, satellite image processing in ENVI and PCI Geomatica.
- Computer languages: FORTRAN90, MATLAB, IDL.

Awards

- 2004-05 Center for Global Change Student Research Grant ($10,000 US).
- 2002 ARCUS Award for Arctic Research Excellence ($1000 US)
- 1996-98 Canadian Circumpolar Institute Research Grant ($2000 CDN)
- 1995-97 Natural Sciences and Engineering Research Council of Canada (NSERC) postgraduate scholarship ($30,000 CDN)
- 1996-97 Northern Scientific Training Program Research Grant ($4000 CDN)
- 1995-96 Geological Society of America Research Grant ($1750 US)
- Summers 1993 – 1994 NSERC undergraduate fieldwork scholarships
- 1990 Governor General of Canada Award for Academic Excellence

Anthony Arendt

Professional Societies

- American Geophysical Union
- Canadian Geophysical Union
- Arctic Institute of North America
- International Glaciological Society

Scientific Community Service

- invited participant, World Climate Research Programme: Workshop on understanding sea-level rise and variability, Paris, France, 2006.
- manuscript reviews for *Science, Geophysical Research Letters, Journal of Geophysical Research, Journal of Glaciology, Hydrological Processes, Journal of Applied Meteorology and Climatology, Geografiska Annaler*

Field Experience

- 3 field seasons in the Canadian high Arctic conducting meteorological, ice depth, motion and mass balance surveys
- 3 field seasons in the Canadian Rocky Mountains assisting with hydrological and hydrochemical measurements
- 5 field seasons in Alaska collecting aircraft altimetry data and surface mass balance measurements
- 1 fields season in Greenland assisting with NASA airborne topographic mapping surveys

Teaching Experience

- Summers 2001-2004: One of four instructors for GEOS 295: field methods in glaciology. Designed an original curriculum, field workbook, and field activities in conjunction with University of Alaska outdoor center.
- 1991-1994: Instructed two semesters of introductory FORTRAN and four semesters of introductory computing.
- 1990-1997: Math and physics tutor.

Outreach and Collaboration

- CNN, CBC, and BBC news television/radio interviews on Alaska glacier changes
- New York Times, Washington Post, National Post and many other newspaper interviews on Alaska glacier changes
- participant in PBS Scientific American Frontiers special on Alaska glaciers, titled "Hot Times in Alaska"
- Visiting scientist, University of Washington, Seattle and University of Stockholm, Sweden.

Anthony Arendt

Journal Publications

Larsen, F., R. Motyka, **A. Arendt**, K. Echelmeyer, P. Geissler (2007). Glacier changes in southeast Alaska and northwest British Columbia and contribution to sea level rise. *Journal of Geophysical Research, 112,* doi:10.1029/2006JF000586.

Arendt, A., K. Echelmeyer, W. Harrison, C. Lingle, S. Zirnheld, V. Valentine, J. Ritchie, M. Druckenmiller (2006). Updated estimates of glacier volume changes in the Western Chugach Mountains, Alaska, USA and a comparison of regional extrapolation methods. *Journal of Geophysical Research, 111,* doi:10.1029/2005JF000436.

Nolan, M., **A. Arendt**, B. Rabus, and L. Hinzman (2006). Volume change of McCall Glacier, Arctic Alaska, from 1956 to 2003. *Annals of Glaciology, 42*, 409–416.

Arendt, A., K. Echelmeyer, W. Harrison, C. Lingle, and V. Valentine (2002). Rapid wastage of Alaska glaciers and their contribution to rising sea level. *Science, 297*, 382–386.

Arendt, A. (1999). Approaches to modelling the surface albedo of a high Arctic glacier. *Geografiska Annaler, 81A*, 477–487.

Arendt, A. and M. Sharp (1999). Energy balance measurements on a Canadian high Arctic glacier and their implications for mass balance modelling. *International Association of Hydrological Sciences, 256*, 165–172.

Woodward, J., M. Sharp, and **A. Arendt** (1997). The influence of superimposed ice formation on the sensitivity of glacier mass balance to climate change. *Annals of Glaciology, 24*, 186–190.

Conference Presentations

Arendt, A. Luthcke, S., Abdalati, W., Larsen, C., Lingle, C., Echelmeyer, K., Krabill, W., Beedle, M. (2007) Combining GRACE and airborne laser altimetry measurements to calculate ice mass changes in Alaska and Northwestern Canada. *Canadian Geophysical Union*, St. John's, Newfoundland.

Arendt, A., K. Echelmeyer, W. Harrison, C. Lingle, S. Zirnheld, B. Ritchie, M. Druckenmiller and V. Valentine (2005). Errors in regional extrapolation of glacier volume changes using data from the Western Chugach Mountains, Alaska, USA. *American Geophysical Union*, San Francisco, CA.

Arendt, A., K. Echelmeyer, W. Harrison, V. Valentine, S. Zirnheld, M. Truffer (2003). Rapid wastage of Alaska glaciers: the search for climatic causes. *Northwest Glaciology Meeting*, Portland OR.

Arendt, A., K. Echelmeyer, W. Harrison, V. Valentine and S. Zirnheld (2003). Rapid wastage of Alaska glaciers: the search for climatic causes. *SEARCH open science meeting*, Seattle WA.

Arendt, A., K. Echelmeyer, W. Harrison, V. Valentine and S. Zirnheld (2002). Rapid wastage of Alaska glaciers: preliminary links to Alaska climatology. *American Geophysical Union*, San Fansisco CA. (Invited talk)