Logic Geophysics & Analytics LLC • ebabcock@logicgeophysics.com • (907) 744-8111

Esther L. Babcock

OUTSTANDING QUALIFICATIONS

Exceptional record of field geophysics and data processing; project management; scientific leadership; and community service
Ph.D. in geophysics; research incorporating seismic and electromagnetic reflection methods; 3 remote international field campaigns
Safety-oriented; excellent communication skills; solid background in mathematics, engineering, and data collection/processing

EDUCATION and TRAINING

Received

2014 Ph.D. Geophysics, Boise State University, Boise, ID 3.98 GPA
- Focal area in public policy for land-use and resource management

2010 M.Sc. Environmental Science, University of Arizona, Tucson, AZ 4.0 GPA
2010 Graduate Certificate in Water Policy, University of Arizona, Tucson, AZ 4.0 GPA
- Focus on environmental law as well as U.S. environmental regulations and policies

2002 B.S. Mathematics (minor in French), United States Air Force Academy, Colorado Springs, CO 3.85 GPA
Misc (most current first) Health & Safety Management training; State of Alaska Emergency Trauma Technician; Project Management Best Practices for Alaska; Wilderness First Responder Certification; 40-Hour HAZWOPER with current 8-Hour Refresher; UX-Analyze Oasis montaj training; COMET Tsunami Distance Learning Course; Safety Introduction to Industrial Hygiene; North Slope Training Co-operative Unescorted Training with H_2S; First Aid and CPR certification; Department of Interior Safety and Occupational Health; National Safety Council Defensive Driving; Basic Aviation Safety; Helicopter Operations Safety; Underwater Aircraft Egress Training; Schlumberger Introduction to Exploration and Production; NExT Oil and Gas Training and Competency Development; Imperial Oil Geophysics Short Course; ExxonMobil Geophysics Short Course; ExxonMobil Geophysics Student Education Program; United States Air Force (USAF) Initial A-10 Fighter Pilot Training Qualification; USAF Introduction to Fighter Fundamentals; Euro-NATO Joint Jet Pilot Training; USAF Survival, Evasion, Resistance, and Escape School; USAF High-Altitude and Physiology Chamber Training; USAF High G-Force Centrifuge Training; USAF Water Survival Training; U.S. Parachute Association Exhibition Parachutist Rating; USAF Advanced Parachute and Jumpmaster Qualification; USAF Air Force Freefall Parachute Training

Instructed

Glacial Geology of the Upper Cook Inlet and Matanuska Glacier: Alaska Pacific University Physical Geology Field Trip (2016)
Geophysical Investigations and Ground-Penetrating Radar: University of Alaska Anchorage Workshop (2015)
Soil physics and science experiments for teachers: engaging and retaining geoscience awareness in high school students. Boise Teachers Association Workshop (2014)
Using Ground-Penetrating Radar to Detect Oil in and under Sea Ice. Alaska Clean Seas 1-Day Workshop (2013)
Implementation of Ground-Penetrating Radar to Detect Oil in and under Sea Ice. Alaska Clean Seas 2-Day Workshop (2012)
Society of Exploration Geophysicists Joint Cryosphere Workshop Ground-Penetrating Radar Demonstration (2012)
Soil Physics Class and Soil Physics Lab, University of Arizona; instructed graduate and undergraduate students (2010)
Tutor, high school through college mathematics (2009-2011)
U.S. Air Force Academy Parachute Training Instructor and Jumpmaster (2000-2002)

WORK HISTORY

April 2017- present **President, Logic Geophysics & Analytics, LLC, Anchorage AK**
- President and chief geophysicist of Logic Geophysics & Analytics LLC, providing near surface geophysical services and data analytics to Alaska and throughout North America
- Applications for civil engineering, environmental sites, concrete evaluation, UXO projects, and archaeological surveys
- Collaborative partners throughout Alaska, North America, and internationally bring vast knowledge and experience to bear on client projects to produce results in the safest, most cost-effective manner possible

Jan 2012 - present **Job Title: Geophysical Consultant, Deep Earth Logic, LLC**
- Provide technical advice and expertise for geophysical considerations of ongoing blasting and seismograph monitoring programs in conjunction with mining and quarry operations to improve safety, to reduce vibrations from blasting, and to improve blast design

Dec 2015 - Feb 2017 **Job Title: Research Geophysicist, USGS Alaska Science Center**
- Independently designed and led geophysical and glaciological research program focused on interdisciplinary research with the U.S. Geological Survey Water, Ice, and Landscape Dynamics Group and collaborations with other U.S. Geological Survey colleagues, State and local resource agency staff, and university faculty and students
- Team leader for all GPR data management at the Alaska Science Center, including survey design, acquisition, data processing, quality control, data interpretation, metadata production, and data archiving in accordance with U.S. Geological Survey standards
- Supervised 1 volunteer data technician and 1 student intern

Oct 2015 - Dec 2015 **Job Title: Research Geophysicist, Antarctica**
- Research geophysical technical lead for ground-penetrating radar research campaign in Antarctica to assess the spatial and temporal variability of rock glaciers in the McMurdo Dry Valleys with University of Massachusetts Lowell

- Designed research goals and strategy for geophysical campaign and supervised field data acquisition in the remote, harsh environment of Antarctica while maintaining the highest health and safety standards

Sep 2014 - Oct 2015 **Job Title: Geophysicist, GeoTek Alaska, Inc., Anchorage AK**

- Geophysical survey design, data acquisition, processing, and interpretation, including: ground-penetrating radar surveys for near surface stratigraphic imaging, concrete evaluation, utility clearance, and UST/pipeline detections; electromagnetic surveys for utility clearance, detecting subsurface contamination, and subsurface analysis; and magnetic surveys for buried object location
- Project manager and business development: ensure client satisfaction throughout lifetime of projects, duties include proposal writing, preparing technical reports, conducting client meetings, delivering professional presentations, and operating marketing efforts
- Supervised 2 geophysical data technicians

Aug 2011 - May 2014 **Job Title**: **Research Associate, Boise State University**

- Independently developed and managed Ph.D.-level research program emphasizing full-waveform inversion and attribute analysis for thin-layer problems as well as advanced processing techniques for geophysical reflection imaging methods
- Seismic and radar data acquisition, processing, and interpretation using ProMAX, Seismic Unix, Matlab, and MS Office
- Additional research focus on contaminated site characterization, including oil in and under ice and snow
- Integration of environmental law, science, and decision-making through public policy focal area

Jan 2009 - Jul 2011 **Job Title**: **Teaching/Research Assistant, University of Arizona**

- Led environmental science research program including focus on water policy and water resource use regulations and permitting
- Provided oversight and mentoring for graduate and undergraduate students while instructing classroom lectures and field labs

May 2002 - May 2007 **Job Title**: **A-10 Pilot, U.S. Air Force, Fairbanks, AK**

- United States Air Force officer in a leadership position including maintaining military and safety standards
- A-10 Pilot: responsible for daily flight operations and mission safety in the single-seat A-10A Thunderbolt II
- International expertise: 62 combat flying missions in Afghanistan during Operation Enduring Freedom
- Squadron scheduler responsible for multi-million dollar assets, over 40 people, and scheduling 100-150 weekly missions
- Squadron fitness officer: designed fitness goals and implemented fitness program for over 40 people including remedial training
- Proficiency with high-stress, high-volume workload and integration of multiple teams from civilian and military backgrounds
- Completed prestigious Euro-NATO Joint Jet Pilot Training program
- Organized and maintained training system and requirements for a team of 24 C-17 Globemaster aircraft and over 40 pilots to promote combat readiness; responsible for all home base operations while team deployed to the Middle East

VOLUNTEER WORK

Participant in Smart Girls Rock, Anchorage School District, Anchorage, Alaska (2020)
Invited judge: Anchorage School District Science Fair (2019)
Invited presenter for Romig Middle School STEM career day, Anchorage, Alaska (2018)
Invited presenter for science presentations describing glaciers and U.S. Geological Survey science program in Anchorage schools (2016)
Invited speaker at the Arctic Native Student Education Program (ANSEP) (2016)
Invited judge for Outstanding Student Paper Award, American Geophysical Union Annual Meeting (2016)
Volunteer for American Geophysical Union Annual Meeting booth staffing (2016)
Invited presenter and lead for research programs and field trips with United States Geologic Survey, Extreme Ice Survey, University of Alaska Anchorage, and Alaska Pacific University (2015- 2017)
Community volunteer in the Anchorage area supporting local food and homeless shelters (2014-present)
Volunteer for the Society of Exploration Geophysicists Annual Meeting: volunteer for the Applied Science Program, assistance with meeting events coordination, and acting as session monitoring (2012-present)
Public education and outreach with the Boise Watershed Center and Wastewater Treatment Facility (2011-2014)
-Outstanding interpretative and science communication ability demonstrated by leading interpretive tours throughout the Center and Facility
Tutored female high-school students in mathematics and science at the Tucson Family Center (2009-2010)

MEDIA

Website development and management services with search engine optimization (various, 2014-present)
Radio interview, ground-penetrating radar for archaeology, 2018
@USGSGlaciology Twitter feed. I initiated this effort and grew the Twitter feed to over 900 followers in 1 year. This public internet forum provided information about science, the USGS, and its program with students, the general public, and fellow researchers. (2016-2017)
Audio-visual production and editing for advertisement and outreach (2017)
Society of Exploration Geophysicists Seismic Soundoff Podcast, invited participant (2016)
Antarctica Dry Valleys 2015 Blog with University of Massachusetts Lowell, invited contributor (2015)
Owyhee Canyoneers Idaho Public Television Show, invited interpreter (2014)

AWARDS and RECOGNITION

2018 Association for Women Geoscientists (AWG) Professional Excellence Award
2016 U.S. Geological Survey Alaska Science Center superior performance award
2015 Antarctic Service Medal, United States Department of Defense
2015 GeoTek Alaska, Inc., performance-based promotion award
2014 Boise State University Department of Geosciences Graduate Student of the Year
2014 Boise State University Student Research Initiative Scholarship Recipient
2013 Society of Independent Professional Earth Scientists Scholarship Recipient
2013 Society of Exploration Geophysicists Travel Grant Recipient
2013 Society of Exploration Geophysicists Foundation Anadarko Scholarship Recipient
2012 Society of Exploration Geophysicists Foundation Scholarship Recipient
2012 ExxonMobil Geosciences Grant Recipient
2012 ExxonMobil Student Education Program Recipient
2006 Air Medal (1 of 3) Meritorious Achievement in Flight, Operation Enduring Freedom, Afghanistan
2006 Air Medal (2 of 3) Meritorious Achievement in Flight, Operation Enduring Freedom, Afghanistan
2006 Air Medal (3 of 3) Meritorious Achievement in Flight, Operation Enduring Freedom, Afghanistan
2006 Global War on Terrorism Service Medal, United States Air Force
2005 Warrior Spirit Award, 357th A-10/A Fighter Training Unit, United States Air Force
2005 Air Force Outstanding Unit Award, United States Air Force
2005 Air Force Longevity Service Award, United States Air Force
2004 National Defense Service Medal, United States Air Force
2003 Company Grade Officer of the Quarter, 60th Operations Group, United States Air Force
2002 Instructor of the Year, United States Air Force Parachute Team: The Wings of Blue
2002 Distinguished Graduate with Academic *and* Athletic Distinction, U.S. Air Force Academy
2002 Dean's and Commandant's Honors Lists, U.S. Air Force Academy
2001 Dean's and Athletics Honors Lists, U.S. Air Force Academy
2000 Dean's and Athletics Honors Lists, U.S. Air Force Academy
2000 Top-Ranked Student, Honors Economics, U.S. Air Force Academy
1999 Dean's, Commandant's, Athletics, and Superintendent's Honors Lists, U.S. Air Force Academy
1998 Dean's and Athletics Honors Lists, U.S. Air Force Academy

AWARDED GRANTS

The Pulse of Alaska's Coastal Parks: Tidewater Glaciers During Climatic Uncertainty, Oceans Alaska Science and Learning Center
A Citizen Science Campaign to Validate Snow Remote Sensing Products, NASA #NNH16ZDA001N-CSEESP

SCIENTIFIC and OTHER LEADERSHIP

Organizing member and reviewer: 19th International Conference on Ground-Penetrating Radar (2020-2022)
Chair: Society of Exploration Geophysicists Foundation Scholarship Committee (2020-2021)
Treasurer: Geophysical Society of Alaska (2019-present)
Associate editor: Journal of Environmental and Engineering Geophysics (2016-present)
Reviewer: Society of Exploration Geophysicists Annual Meeting abstracts (2013-present)
External Reviewer for multiple journals: Remote Sensing Letters, International Journal of Remote Sensing, Journal of Glaciology, Journal of Environment & Engineering Geophysics, Geophysics, Journal of Contaminant Hydrology, and Progress in Electromagnetic Research (2012-present)
Vice-president: Driftwood Bay Homeowners' Association Board of Directors (2019-present)
Chair: Geophysical Society of Alaska Scholarship Committee (2016-2019)
Organizer and Session Co-Chair: Near-Surface Technical Sessions for 2018 Society of Exploration Geophysicists' annual meeting (2017-2018)
Metadata: development and implementation of metadata standards and data archiving for ground-penetrating radar data at the U.S. Geological Survey Alaska Science Center (2016-2017)
Safety-in-Science Leadership: led the U.S. Geological Survey Glaciers Group effort to uphold and exceed safety standards during intensive research campaigns, including spearheading efforts to train group personnel in wilderness first aid, bear awareness, and avalanche hazards. (2016-2017)
Internal Reviewer: U.S. Geological Survey (2015-2017)
Vice-President: Department of Interior Veterans Committee (2017)
Invited Session Organizer: Near-Surface Asian Pacific Conference (2016)
President: Driftwood Bay Homeowners' Association Board of Directors (2016-2018)

Communications Officer: Geophysical Society of Alaska (2014-2016)
Treasurer: Driftwood Bay Homeowners' Association Board of Directors (2015)
Secretary: Society of Exploration Geophysicists Near-Surface Committee (2012-2013)
Squadron Fitness Officer: U.S. Air Force, 357th Fighter Squadron (2005)
Squadron Training Officer: U.S. Air Force, 21st Airlift Squadron (2002)
Jumpmaster: U.S. Air Force Parachute Team (2000-2002)
Reconditioning (Physical Fitness) Cadet-in-Charge: 2nd group, U.S. Air Force Academy (2000-2002)
Cadet Commander: U.S. Air Force Parachute Team (2001)
Cadet Operations Officer: U.S. Air Force Academy, 2nd Group (2000)
Cadet Training Officer: U.S. Air Force Academy, 30th Squadron (1999)

COLLABORATORS

Alaska Pacific University (formerly affiliate faculty), Green Geophysics, Inc., Deep Earth Logic LLC, Siebert & Associates LLC, United States Geological Survey, University of Wyoming, University of Alaska Fairbanks, University of Alaska Southeast, University of Washington, Oregon State University, University of Massachusetts Lowell, National Park Service, Temple University, Alaska State Department of Geophysical and Geological Surveys, the Village of Chevak (AK)

COMMITTEES and BOARDS

State of Alaska Veteran's Advisory Council (2021-present)
University of Alaska Anchorage Campus Advisory Board for Geologic Sciences (2022-present)
Society of Exploration Geophysicists Continuing Education Committee (2021)
Society of Exploration Geophysicists Foundation Scholarship Committee (2014-2021)
Society of Exploration Geophysicists Committee on Nominations (2016-2018)
Geophysical Society of Alaska Scholarship Committee (2015-present)
Geophysical Society of Alaska Student Outreach Committee (2014-present)
Geophysical Society of Alaska Annual Picnic Organization Committee (2014-present)
Driftwood Bay Homeowners' Association Board of Directors (2015-present)

MENTORING

Mentoring: From 2014-2021, as part of the Society of Exploration Geophysicists Foundation Scholarship Committee, I mentored students in the United States and Canada, as well as internationally throughout Europe, Russia, and China; and ranging from undergraduate to Ph.D.-level. This mentoring is a time-intensive commitment that positively impacts the lives of future geophysical professionals.

PROFESSIONAL MEMBERSHIPS

Society of Exploration Geophysicists (Member Near-Surface Section)
American Geophysical Union
Alaska Resource Development Council
U.S. Air Force Academy Association of Graduates
Geophysical Society of Alaska
Association for Women Geoscientists
International Glaciology Society
U.S. Women's Chamber of Commerce

PUBLICATIONS and REPORTS

Babcock, E.L., T. Carey, T. Mayrberger, and K. Soofi. 2020. Where gravel is gold: geophysical gravel exploration on Alaska's North Slope. *Geophysics* (in progress).

Babcock, E.L., S. Candela, M. Loso, and S. O'Neel. 2020. Ground-penetrating-radar estimates of snow depth on Taku Glacier, Alaska over an isothermal saturated snowpack and implications for glacier mass balance: *Journal of Environmental and Engineering Geophysics* (in revision).

Babcock, E.L. 2021. Ground-penetrating-radar Investigations to Support a Church Relocation Due to Coastal Erosion. Fast Times Technical Articles, 26(3).

Winsor, K., K.M. Swanger, **E.L. Babcock**, J.L. Dickson, D. Schmidt, and R.D. Valetta. 2020. Origin, structure and geochemistry of a rock glacier near Don Juan Pond, Wright Valley, Antarctica: *Antarctic Science*, 32(4): 273-287.

Winsor, K., K.M. Swanger, **E.L. Babcock**, R.D. Valetta, and J.L. Dickson. 2020. Rock glacier characteristics serve as an indirect record of multiple alpine glacier advances in Taylor Valley, Antarctica: *The Cryosphere*, 14: 1-16.

Swanger, K.M., **E.L. Babcock**, K. Winsor, and R.D. Valletta. 2019. Rock Glaciers in Pearse Valley, Antarctica record outlet and alpine glacier advance from MIS 5 through the Holocene: *Geomorphology*, 336: 40-51.

Creighton, A.L., A.D. Parsekian, M. Angelopolous, B.M. Jones, A. Bondurant, M. Engram, J. Lenz, P. Overduin, G. Grosse, **E.L. Babcock**, and C. Arp. 2018. Transient electromagnetic surveys for determination of talik depth and geometry beneath thermokarst lakes: *Journal of Geophysical Research, Solid Earth*, 123(11): 9310-9323.

Jones, B.M., C.A. Baughman, V.E. Romanovsky, A.D. Parsekian, **E.L. Babcock**, M.C. Jones, G. Grosse, and E.E. Berg. 2016. The presence of rapidly degrading permafrost plateaus in southcentral Alaska: *The Cryosphere*, 10: 2673-2692.

Babcock, E.L., A.P. Annan, and J.H. Bradford. 2016. Cable effects in ground-penetrating radar data and implications for quantitative amplitude measurements: *Journal of Engineering and Environmental Geophysics.*

Freemuth, J. and **E.L. Babcock**. 2016. "Governance, Science and the Federal Lands" in Environmental Politics in the West (3rd ed.), Zachary Smith and John Freemuth eds., Boulder: University of Colorado.

Bradford, J.H., **E.L. Babcock**, H.-P, Marshall, and D.F. Dickins. 2016. Targeted full-waveform inversion of ground-penetrating radar data for quantification of oil spills under sea ice: *Geophysics*, 81(1): WA59-WA70.

Babcock, E.L. and J.H. Bradford. 2015. Quantifying the GPR response to ultra-thin layers of non-aqueous phase liquid contaminants: *Interpretation*, 3(4): SAB23-SA31.

Babcock, E.L., C.N. Nettels, and P. Beardsley. 2015. Assessment of the transport mechanism at a hydrocarbon spill site using geophysical, geological, and geotechnical techniques: *Interpretation*, 3(4): SAB1-SAB7.

Babcock, E.L., J.H. Bradford, and C. Hall. 2015. Electrical anisotropy in sea ice and a dual-polarization radar system to mitigate the effects of preferential attenuation in imaging sea ice: *Cold Regions Science and Technology,* 118: 105-111.

Bradford, J.H., H.-P. Marshall, **E.L. Babcock**, and D.F. Dickins. 2015. Targeted Full-Waveform Inversion of Ground-Penetrating Radar Data for Quantification of Oil Spills Under Sea Ice: Arctic Technology Conference Expanded Abstract.

Babcock, E.L. and J.H. Bradford. 2015. Reflection waveform inversion of ground-penetrating radar data for characterizing thin and ultra-thin layers of non-aqueous phase liquid contaminants in stratified media: *Geophysics*, 80(2): H1-H11.

Babcock, E.L. and J.H. Bradford. 2014. Quantifying the basal conditions of a mountain glacier using a targeted full-waveform inversion: Bench Glacier, Alaska: *Journal of Glaciology*, 60(224): doi: 10.3189/2014JoG14J072.

Babcock, E.L. 2014. Targeted full-waveform inversion for recovering thin- and ultra-thin-layer properties using radar and seismic reflection methods: Doctoral Dissertation, Boise State University Scholarworks.

Hu, E., **E.L. Babcock**, S.E. Bialkowski, S.B. Jones, and M. Tuller. 2014. Methods and Techniques for Measuring Gas Emissions from Agricultural and Animal Feeding Operations: *Critical Reviews in Analytical Chemistry*, 44: 200 – 218.

Babcock, E.L., J.H. Bradford, and C. Hall. 2013. Radar wave anisotropy in sea ice and implications for oil spill detection in and under sea ice: Society of Exploration Geophysicists Annual Meeting Technical Program Expanded Abstracts, 4568 – 4572.

Babcock, E.L. and J.H. Bradford. 2013. Detecting Subsurface Contamination Using Ground Penetrating Radar and Amplitude Variation with Offset Analysis: *IEEE Proceedings*: 7th International Workshop on Advanced Ground Penetrating Radar.

Bradford, J.H. and **E.L. Babcock**. 2013. The need to adapt the exploration model from the oil patch to contaminated-site characterization: A case study from Hill AFB, Utah, USA: *The Leading Edge*, 32(7): 750-756.

Babcock, E.L. and J. Silvertooth. 2012. Soil Testing and Plant Analysis Relationships for Irrigated Chile Production: *Communications in Soil Science and Plant Analysis*, 43(20): 2651-2668.

Babcock, E.L., M. Tuller, S.B. Jones, and J. Walworth. 2011. Greenhouse Gas Emission from Agriculture and Animal Operations: Influencing Factors, Measurement Limitations, and Potential Mitigation Strategies. Conference Paper: ASA-CSSA-SSSA International Annual Meetings.

Babcock, E.L. 2010. Soil Testing and Plant Analysis Relationships for Irrigated Chile Production: M.S. Thesis, University of Arizona, Tucson, AZ.

PRESENTATIONS and ABSTRACTS

Babcock, E.L. 2022. Ground-penetrating-radar surveys to locate burials in Karluk, Alaska; Alaska Anthropological Association Annual Meeting.

Babcock, E.L. 2021. Geophysics in Alaska: Arctic Applications; University of Wyoming, Invited presentation.

Babcock, E.L. 2021. Ground-penetrating radar: Theory and Practice in Alaska; Kansas State University, Invited presentation.

Babcock, E.L. 2021. Near-surface geophysics for environmental and engineering problems: Case studies from Alaska; Society of Exploration Geophysicists' Women's Network, Invited presentation.

Babcock, E.L. 2020. Geophysical tools for engineering applications; American Society of Civil Engineers, Invited Talk.

Babcock, E.L. 2020. Business of Applied Geophysics. Society of Exploration Geophysicists Annual Meeting, Plenary Session, Invited Talk.

Babcock, E.L. 2020. What lies below: Subsurface investigations in northern regions using geophysical tools: Arctic Ambitions VIII.

Babcock, E.L. 2019. Geophysical tools for infrastructure and environmental project in Alaska: Alaska Tribal Conference on Environmental Management.

Swanger, K., R. DeWitt., **E.L. Babcock**, and K. Winsor. 2019. Holocene stream degradation of pre-Holocene buried ice in the Dry Valleys: using optically-stimulated luminescence dating on fluvial deposits**:** International Symposium on Antarctic Earth Sciences.

Swanger, K., K. Winsor, **E..L. Babcock**, R. ReWitt, and A. Pelletier. 2019. Burial of cold-based glacier ice in the McMurdo Dry

Valleys, Antarctica: International Symposium on Antarctic Earth Sciences.

Babcock, E.L. 2018. Using Geophysics to see beneath the surface: Alaska Native Village Corporation Association.

Creighton, A., A. Parsekian, M. Angelopoulos, B. Jones, A. Bondurant, P. Overduin, **E.L. Babcock**, M. Engram, and C. Arp. 2017. Effect of thermokarst lake margin expansion rate on sub-lake permafrost thaw in continuous permafrost: American Geophysical Union Annual Meeting.

Creighton, A., A. Parsekian, B. Jones, **E.L. Babcock**, A. Bondurant, and C. Arp. 2017. Geophysical investigations of talik structure beneath and actively expanding thermokarst lake in continuous permafrost: Symposium on the Application of Geophysics to Engineering and Environmental Problems.

O'Neel, S., L. Sass, C. McNeil, **E.L. Babcock**, and 10 others. 2016. From icefield to ocean: investigating biophysical linkages at Wolverine Glacier, Alaska: American Geophysical Union Annual Meeting.

Baughman, C.A., B.M. Jones, **E.L. Babcock**, K.L. Bodony, D.H. Mann, C.F. Larsen, E.A. Himelstoss and J. Smith. 2016. Remotely sensing a cold region dune field using airborne LiDAR and high resolution aerial photography: American Geophysical Union Annual Meeting.

Winsor, K., K.M. Swanger, **E.L. Babcock**, R.D. Valletta, and J.L. Dickson. 2016. Multiple Ice Advances Suggested by Rock Glacier Stratigraphy and Surface Weathering in the McMurdo Dry Valleys, East Antarctica: American Geophysical Union Annual Meeting.

Babcock, E.L., L. Sass, S. Candela, D. McGrath, C. McNeil, and S. O'Neel. 2016. Spatial variability of snow accumulation from 170 kilometers of ground- and air-borne ground-penetrating-radar data over Wolverine Glacier, Alaska: American Geophysical Union Annual Meeting.

McGrath, D., L. Sass, C. McNeil, **E.L. Babcock**, S. Candela, S. O'Neel, A. Arendt, and H.-P. Marshall. 2016. Inter-annual variability in snow accumulation using ground-penetrating radar on Wolverine and Gulkana glaciers, Alaska: Implications for glacier mass-balance modeling: American Geophysical Union Annual Meeting.

Creighton, A., A. Parsekian, C. Arp, B. Jones, **E.L. Babcock**, and A. Bondurant. 2016. Geophysical characterization of cold regions hydrology and permafrost dynamics: American Geophysical Union Annual Meeting.

Young, E., A. Muto, and E. Babcock. 2016. Summer-time mass balance of Wolverine Glacier, Alaska, derived from ground-based time-lapse microgravity measurements: American Geophysical Union Annual Meeting.

McGrath, D., L. Sass, **E.L. Babcock**, C. McNeil, S. Candela, A. Arendt, and H.-P. Marshall. 2016. From n=3 to n=200,000: Applications of GPR to measure snow accumulation on glaciers: Mountain Climate Conference.

Whorton, E., C. McNeil, L. Sass, A. Clark, S. O'Neel, D. Fagre, D. McGrath, E. Peitzsch, **E.L. Babcock**, and J. Foreman. 2016. Moving forward: U.S. Geological Survey glacier mass balance research: Mountain Climate Conference.

O'Neel, S., L. Sass, C. McNeil, **E.L. Babcock**, D. McGrath, A. Arendt, E. Klein, H.-P. Marshall, E. Hood, D. Hill, J. Beamer. 2016. Biophysical linkages in coastal Alaska's icefield-to-ocean ecosystem: Mountain Climate Conference.

Babcock, E.L., S. O'Neel, S. Candela, L. Sass, D. McGrath, and C. McNeil. 2016. Data, data everywhere but how much do you need? Northwest Glaciology Annual Meeting.

Baughman, C.A., B.M. Jones, **E.L. Babcock**, K.L. Bodony, D.H. Mann, C.F. Larsen, and J. Smith. 2016. Remotely sensing the Nogahabara dune field using airborne LiDAR and high resolution aerial photography: The 14th International Circumpolar Remote Sensing Symposium.

Jones, B.M., C.A. Baughman, V.E. Romanovsky, A.D. Parsekian, **E.L. Babcock**, M.C. Jones, G. Grosse, and E.E. Berg. 2016. The presence of rapidly degrading permafrost plateaus in southcentral Alaska: International Conference on Permafrost.

Babcock, E.L. 2016. Everything You Always Wanted to Know About Ground-Penetrating Radar: U.S. Geological Survey Alaska Science Center Invited Presentation.

Winsor, K., K.M. Swanger, J.L. Dickson, **E.L. Babcock**, and R.D. Valletta. 2016. Potential rock glacier surface sediment contribution to meltwater geochemistry: A Wright Valley cases study. Scientific Committee on Antarctica Research Annual Meeting.

Winsor, K., K.M. Swanger, R.D. Valletta, J.L. Dickson, and **E.L. Babcock**. 2016. Long-term surface weathering along a rock glacier in the South Fork of Wright Valley, East Antarctica: Geological Society of American Northeastern Section Annual Meeting

Swanger, K.M., K. Winsor, R. DeWitt, **E.L. Babcock**, R.D.Valletta, and J.L. Dickson. 2016. Buried glacial ice in the McMurdo Dry Valleys: climate archives on the edge of change: Scientific Committee on Antarctica Research Annual Meeting.

Babcock, E.L., C. Nettels., and P. Beardsley. 2016. Case History: Assessment of the transport mechanism at an accidental hydrocarbon release using geophysical, geotechnical, and geological information: Symposium on the Application of Geophysics to Engineering and Environmental Problems.

Babcock, E.L. and J.H. Bradford. 2016. Quantifying the ground-penetrating radar response to ultra-thin layers of non-aqueous phase liquid contaminants: Symposium on the Application of Geophysics to Engineering and Environmental Problems.

Babcock, E.L. 2015. Environmental and Contaminated Site Characterization using Geophysical Electrical Methods: Bristol Environmental Remediation Services.

Babcock, E.L. 2014. Considerations for Detecting Spilled Oil in and Under Ice and Snow: Geophysical Society of Alaska Invited Presentation.

Babcock, E.L. 2014. Technical Considerations for Geophysical Tools Implemented for Environmental and Geotechnical Characterization: Environmental Resources Management of Anchorage.

Babcock. E.L. 2014. Targeted full-waveform inversion for recovering thin- and ultra-thin-layer properties using radar and seismic reflection methods: Doctoral Dissertation Defense.

Babcock, E.L., J.H. Bradford, and K. Lindsey. 2014. Estimating snow-water equivalent in Arctic and mountain environments using long-distance ground-penetrating-radar transects: Boise State University Student Research Conference.

Babcock, E.L. and J.H. Bradford. 2013. Detecting Subsurface Contamination Using Ground Penetrating Radar and Amplitude Variation with Offset Analysis: 7th International Workshop on Advanced Ground Penetrating Radar.

Lindsey, K., **E.L. Babcock**, and J.H. Bradford. 2013. Got clean water? Seismic imaging for groundwater management in coastal Bénin, West Africa: Geoscientists Without Borders Presentation.

Babcock, E.L. 2013. Ground-penetrating radar: Theory and application for oil-spill detection in and under sea ice: ConocoPhillips Invited Presentation.

Babcock, E.L. and J.H. Bradford. 2013. Detecting Subsurface Contaminants Using Ground-Penetrating Radar and Amplitude Variation with Offset Analysis: ExxonMobil Invited Presentation.

Babcock, E.L. and J.H. Bradford. 2013. Targeted full-waveform inversion for ultra-thin layer properties using ground-penetrating radar data: American Geophysical Union Fall Meeting.

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