

# Dr. Benjamin W. Abbott

Assistant Professor of Ecosystem Ecology  
Brigham Young University  
Department of Plant and Wildlife Sciences  
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## Research interests

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Ecosystem ecology, Ecohydrology, Terrestrial-aquatic interactions, Permafrost, Disturbance, Aquatic ecology, Human health, Limnology, Environmental and economic sustainability, Expert assessment, Climate change, Global water cycle, Statistics, Science communication and policy

## Education

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University of Alaska Fairbanks, Ph.D., December 2014. Department of Biology and Wildlife.  
Adviser: Jeremy B. Jones. Dissertation: *Permafrost in a warmer world: net ecosystem carbon imbalance*

Utah State University, B.S., April 2009. Major: Watershed and Earth Science. Minors: French & English. Adviser: Chris Luecke. Undergraduate research project: *Energy pathways and food sources: stable isotope analysis in an arctic lake*

## Professional experience

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Assistant professor, Brigham Young University	2017-present
Postdoctoral fellow, Michigan State University	2016-2017
Marie Curie postdoctoral fellow, Université de Rennes 1	2014-16
Research and teaching assistant, University of Alaska Fairbanks	2009-14
Staff writer: natural resources and science correspondent for the <i>Utah Statesman</i>	2008-09
Undergraduate researcher, <i>Limnology</i> , Utah State University	2007-09

## Scientific articles (30 articles, 1035 citations in Google Scholar)

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Kolbe, T, J.-R. de Dreuzy, **B.W. Abbott**, L. Aquilina, T. Babey, C.T. Green, J.H. Fleckenstein, T. Labasque, A.M. Laverman, J. Marçais, S. Peiffer, Z. Thomas, G. Pinay. **2019**. *Stratification of reactivity determines nitrate removal in groundwater*. [Proceedings of the National Academy of Sciences \(PNAS\)](#).

Zarnetske, J. P., M. Bouda, **B. W. Abbott**, J. Saiers, and P. A. Raymond. **2018**. *Generality of hydrologic transport limitation of watershed organic carbon flux across ecoregions of the United States*. [Geophysical Research Letters](#).

Marçais, J., A. Gauvain, T. Labasque, **B. W. Abbott**, G. Pinay, L. Aquilina, F. Chabaux, D. Viville, and J.-R. de Dreuzy. **2018**. *Dating groundwater with dissolved silica and CFC concentrations in crystalline aquifers*. [Science of The Total Environment](#).

Thomas, Z., and **B. W. Abbott**. **2018**. *Hedgerows reduce nitrate flux at hillslope and catchment scales via root uptake and secondary effects*. [Journal of Contaminant Hydrology](#).

Malone, E. T., **B. W. Abbott**, M. J. Klaar, C. Kidd, M. Sebilo, A. M. Milner, and G. Pinay. **2018**. *Decline in Ecosystem  $\delta^{13}C$  and Mid-Successional Nitrogen Loss in a Two-Century Postglacial Chronosequence*. [Ecosystems](#).

Larsson, M., and **B. W. Abbott**. **2018**. *Is the Capacity for Vocal Learning in Vertebrates Rooted in Fish Schooling Behavior?* [Evolutionary Biology](#).

## Curriculum vitae Benjamin W. Abbott

- Liu, F., L. Chen, **B. W. Abbott**, Y. Xu, G. Yang, D. Kou, S. Qin, J. Strauss, Y. Wang, B. Zhang, and Y. Yang. **2018**. *Reduced quantity and quality of SOM along a thaw sequence on the Tibetan Plateau*. Environmental Research Letters.
- Abbott, B. W.**, F. Moatar, O. Gauthier, O. Fovet, V. Antoine, and O. Ragueneau. **2018**. *Trends and seasonality of river nutrients in agricultural catchments: 18 years of weekly citizen science in France*. Science of The Total Environment.
- Loranty, M. M., **B. W. Abbott**, D. Blok, T. A. Douglas, H. E. Epstein, B. C. Forbes, B. M. Jones, A. L. Kholodov, H. Kropp, A. Malhotra, S. D. Mamet, I. H. Myers-Smith, S. M. Natali, J. A. O'Donnell, G. K. Phoenix, A. V. Rocha, O. Sonnentag, K. D. Tape, and D. A. Walker. **2018**. *Reviews and syntheses: Changing ecosystem influences on soil thermal regimes in northern high-latitude permafrost regions*. Biogeosciences.
- Pinay, G., S. Bernal, **B. W. Abbott**, A. Lupon, E. Marti, F. Sabater, and S. Krause. **2018**. *Riparian Corridors: A New Conceptual Framework for Assessing Nitrogen Buffering Across Biomes*. Frontiers in Environmental Science.
- Abbott, B. W.**, G. Gruau, J. P. Zarnetske, F. Moatar, L. Barbe, Z. Thomas, O. Fovet, T. Kolbe, S. Gu, A.-C. Pierson-Wickmann, P. Davy, and G. Pinay. **2018**. *Unexpected spatial stability of water chemistry in headwater stream networks*. Ecology Letters.
- Meehan, A. D., **B. W. Abbott**, and M. Larsson. **2018**. *Movement Is the Song of the Body: Reflections on the Evolution of Rhythm and Music and Its Possible Significance for the Treatment of Parkinson's Disease*. Evolutionary Studies in Imaginative Culture.
- Mu, C. C., **B. W. Abbott**, X. D. Wu, Q. Zhao, H. J. Wang, H. Su, S. F. Wang, T. G. Gao, H. Guo, X. Q. Peng, and T. J. Zhang. **2017**. *Thaw Depth Determines Dissolved Organic Carbon Concentration and Biodegradability on the Northern Qinghai-Tibetan Plateau*. Geophysical Research Letters.
- Moatar, F., **B. W. Abbott**, C. Minaudo, F. Curie, and G. Pinay. **2017**. *Elemental properties, hydrology, and biology interact to shape concentration-discharge curves for carbon, nutrients, sediment, and major ions*. Water Resources Research.
- Mu, C., **B. W. Abbott**, Q. Zhao, H. Su, S. F. Wang, Wu Q. B., Zhang T. J., and Wu X. D. **2017**. *Permafrost collapse shifts alpine tundra to a carbon source but reduces N<sub>2</sub>O and CH<sub>4</sub> release on the northern Qinghai-Tibetan Plateau*. Geophysical Research Letters.
- Abbott, B. W.**, V. Baranov, C. Mendoza-Lera, M. Nikolakopoulou, A. Harjung, T. Kolbe, M. N. Balasubramanian, T. N. Vaessen, F. Ciocca, A. Campeau, M. B. Wallin, P. Romeijn, M. Antonelli, J. Gonçalves, T. Datry, A. M. Laverman, J.-R. de Dreuzy, D. M. Hannah, S. Krause, C. Oldham, and G. Pinay. **2016**. *Using multi-tracer inference to move beyond single-catchment ecohydrology*. Earth-Science Reviews.
- Abbott, B. W.**, J. B. Jones, E. A. G. Schuur, F. S. C. III, W. B. Bowden, M. S. Bret-Harte, H. E. Epstein, M. D. Flannigan, T. K. Harms, T. N. Hollingsworth, M. C. Mack, A. D. McGuire, S. M. Natali, A. V. Rocha, S. E. Tank, M. R. Turetsky, J. E. Vonk, K. P. Wickland, G. R. Aiken, H. D. Alexander, R. M. W. Amon, B. W. Benscoter, Y. Bergeron, K. Bishop, O. Blarquez, B. Bond-Lamberty, A. L. Breen, I. Buffam, Y. Cai, C. Carcaillet, S. K. Carey, J. M. Chen, H. Y. H. Chen, T. R. Christensen, L. W. Cooper, J. H. C. Cornelissen, W. J. de Groot, T. H. DeLuca, E. Dorrepaal, N. Fetcher, J. C. Finlay, B. C. Forbes, N. H. F. French, S. Gauthier, M. P. Girardin, S. J. Goetz, J. G. Goldammer, L. Gough, P. Grogan, L. Guo, P. E. Higuera, L. Hinzman, F. S. Hu, G. Hugelius, E. E. Jafarov, R. Jandt, J. F. Johnstone, J. Karlsson, E. S. Kasischke, G. Kattner, R. Kelly, F. Keuper, G. W. Kling, P. Kortelainen, J. Kouki, P. Kuhry, H. Laudon, I. Laurion, R. W. Macdonald, P. J. Mann, P. J. Martikainen, J. W. McClelland, U. Molau, S. F. Oberbauer, D. Olefeldt, D. Paré, M.-A. Parisien, S. Payette, C. Peng, O. S. Pokrovsky, E. B. Rastetter, P. A. Raymond, M. K. Reynolds, G. Rein, J. F. Reynolds, M. Robard, B. M. Rogers, C. Schädel, K. Schaefer, I. K. Schmidt, A. Shvidenko, J. Sky, R. G. M. Spencer, G. Starr, R. G. Striegl, R. Teisserenc, L. J. Tranvik, T. Virtanen, J. M. Welker, and S. Zimov. **2016**. *Biomass offsets little or none of permafrost carbon release from soils, streams, and wildfire: an expert assessment*. Environmental Research Letters.

## Curriculum vitae Benjamin W. Abbott

- Kolbe, T., J. Marçais, Z. Thomas, **B. W. Abbott**, J.-R. de Dreuzy, P. Rousseau-Gueutin, L. Aquilina, T. Labasque, and G. Pinay. **2016**. *Coupling 3D groundwater modeling with CFC-based age dating to classify local groundwater circulation in an unconfined crystalline aquifer*. Journal of Hydrology.
- Thomas, Z., **B. W. Abbott**, O. Troccaz, J. Baudry, and G. Pinay. **2016**. *Proximate and ultimate controls on carbon and nutrient dynamics of small agricultural catchments*. Biogeosciences.
- Thomas, Z., P. Rousseau-Gueutin, T. Kolbe, **B. W. Abbott**, J. Marçais, S. Peiffer, S. Frei, K. Bishop, P. Pichelin, G. Pinay, and J.-R. de Dreuzy. **2016**. *Constitution of a catchment virtual observatory for sharing flow and transport model outputs*. Journal of Hydrology.
- Abbott, B. W.**, and J. B. Jones. **2015**. *Permafrost collapse alters soil carbon stocks, respiration, CH<sub>4</sub>, and N<sub>2</sub>O in upland tundra*. Global Change Biology.
- Ben Maamar, S., L. Aquilina, A. Quaiser, H. Pauwels, S. Michon-Coudouel, V. Vergnaud-Ayraud, T. Labasque, C. Roques, **B. W. Abbott**, and A. Dufresne. **2015**. *Groundwater isolation governs chemistry and microbial community structure along hydrologic flowpaths*. Frontiers in Microbiology.
- Abbott, B. W.**, J. B. Jones, S. E. Godsey, J. R. Larouche, and W. B. Bowden. **2015**. *Patterns and persistence of hydrologic carbon and nutrient export from collapsing upland permafrost*. Biogeosciences.
- Larouche, J. R., **B. W. Abbott**, W. B. Bowden, and J. B. Jones. **2015**. *The role of watershed characteristics, permafrost thaw, and wildfire on dissolved organic carbon biodegradability and water chemistry in Arctic headwater streams*. Biogeosciences.
- Vonk, J. E., S. E. Tank, P. J. Mann, R. G. M. Spencer, C. C. Treat, R. G. Striegl, **B. W. Abbott**, and K. P. Wickland. **2015**. *Biodegradability of dissolved organic carbon in permafrost soils and aquatic systems: a meta-analysis*. Biogeosciences.
- Abbott, B. W.**, J. R. Larouche, J. B. Jones, W. B. Bowden, and A. W. Balsler. **2014**. *Elevated dissolved organic carbon biodegradability from thawing and collapsing permafrost: Permafrost carbon biodegradability*. Journal of Geophysical Research: Biogeosciences.
- Harms, T. K., **B. W. Abbott**, and J. B. Jones. **2014**. *Thermo-erosion gullies increase nitrogen available for hydrologic export*. Biogeochemistry.
- Schuur, E. A. G., **B. W. Abbott**, W. B. Bowden, V. Brovkin, P. Camill, J. G. Canadell, J. P. Chanton, F. S. Chapin, T. R. Christensen, P. Ciais, B. T. Crosby, C. I. Czimczik, G. Grosse, J. Harden, D. J. Hayes, G. Hugelius, J. D. Jastrow, J. B. Jones, T. Kleinen, C. D. Koven, G. Krinner, P. Kuhry, D. M. Lawrence, A. D. McGuire, S. M. Natali, J. A. O'Donnell, C. L. Ping, W. J. Riley, A. Rinke, V. E. Romanovsky, A. B. K. Sannel, C. Schädel, K. Schaefer, J. Sky, Z. M. Subin, C. Tarnocai, M. R. Turetsky, M. P. Waldrop, K. M. Walter Anthony, K. P. Wickland, C. J. Wilson, and S. A. Zimov. **2013**. *Expert assessment of vulnerability of permafrost carbon to climate change*. Climatic Change.
- Bowden, W. B., J. R. Larouche, A. R. Pearce, B. T. Crosby, K. Krieger, M. B. Flinn, J. Kampman, M. N. Gooseff, S. E. Godsey, J. B. Jones, **B. W. Abbott**, Jorgenson, M. T., Kling, G. W., Mack, M., Schuur, E. A. G., Baron, A. F., and Rastetter, E. B. **2012**. *An integrated assessment of the influences of upland thermal-erosional features on landscape structure and function in the foothills of the Brooks Range, Alaska*. Proceedings of the Tenth International Conference on Permafrost.
- Schuur, E. A. G., **B. W. Abbott**, and the Permafrost Carbon Network. **2011**. *Climate change: High risk of permafrost thaw*. Nature.

### Book chapter and scientific reports

- BW Abbott**, G Pinay, T Burt. **2017**. *Where land becomes stream: connecting spatial and temporal scales to better understand and manage catchment ecosystems*. EOS meeting report.

## Curriculum vitae Benjamin W. Abbott

- G Pinay, S Bernal, **BW Abbott**, A Lupon, E Marti, F Sabater. **2017**. *Riparian corridors: spine, skin and kidneys of river systems*. Chapter in *Ecohydrological Interfaces*, S Krause, DM Hannah, NB Grimm. Wiley.
- V Vergnaud-Ayraud, L Aquilina, T Labasque, **BW Abbott**, C Vautier, JR de Dreuzy, T Kolbe, Z Thomas, L Ruiz, G Pinay. **2015**. *Impact of the fractured reservoir on catchment response time: groundwater dating inputs*. Comité Français d'Hydrogéologie de l'Association Internationale des Hydrogéologues, La Roche-sur-Yon.
- P Good, J Lowe, J Ridley, JL Bamber, T Payne, A Keen, J Stroeve, L Jackson, Meric Srokosz, G Kay, A Harper, B Kruijt, E Burke, **BW Abbott**, F O'Connor, T Minshull, C Turley, P Williamson. **2014**. *Post-AR5 literature review on large-scale systems with potential for abrupt and/or irreversible change*, AVOID2, [www.avoid.uk.net](http://www.avoid.uk.net)
- J Sky, M New, SD Donner, JL Bamber, FS Chapin III, EAG Schuur, M Beniston, **BW Abbott**. **2011**. *Dangerous climate change assessment project final report*, [U.K. Government, Met Office Website](http://www.uk.gov.uk)
- BW Abbott**, N Braithwaite, J Elsner, P Mason, J Randal, D Epstein. **2009**. *Comparative limnological analysis of Cutler Reservoir and Dingle Marsh with respect to eutrophication*, Bear River Watershed Information System.

### Selected professional presentations (<sup>(s)</sup>student, <sup>(i)</sup> invited, \*\* award received)

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#### Scientific talks

- <sup>(i)</sup>**BW Abbott**, R Pomerance, S Natali. **2018**. *Permafrost carbon outreach and activism opportunities*, Permafrost Carbon Network Annual Meeting. Washington DC.
- <sup>(s)</sup>SS Sayedi, **BW Abbott**, J Frederick, BF Thornton, J Vonk, P Overduin, A Maslakov, EAG Schuur, T Zhang, CC Mu, AD McGuire, K Schreiner, JD Joo, E Pizhankova, A Gavrilov, JP Zarnetske, K Schaefer. **2018**. *Expert assessment of subsea permafrost and related emissions*. Permafrost Carbon Network Annual Meeting. Washington DC.
- <sup>(i)</sup>**BW Abbott**. **2018**. *Spatial stability of water quality provides a shortcut to solving eutrophication*. Utah State University, Watershed and Earth System Science department seminar, Logan, Utah.
- <sup>(s)</sup>M Buhman, **BW Abbott**, K Bishop, JP Zarnetske, G Pinay. **2018**. *Global water cycle diagrams minimize human influence and over-represent water security*. Salt Lake City Watershed Symposium.
- BW Abbott**, E Wologo, S Textor, S Shakil, S Zolkos, S Ewing, R Spencer, M Baker, S Tank, J O'Donnell, KP Wickland, J Lee-Cullin, JP Zarnetske, F Liu, Yang, P Kortelainen, J Kolehmainen, J Dean, J Vonk, RM Holmes, G Pinay, PJ Mann, <sup>(s)</sup>J Howe. **2018**. *Could priming and nutrient effects from degrading permafrost alter dissolved organic matter dynamics in permafrost rivers?* European Conference on Permafrost. Chamonix, France.
- <sup>(s)</sup>BJ Frei, <sup>(s)</sup>N Griffin, **BW Abbott**, Z Aanderud, JP Zarnetske, WB Bowden, F Iannuci. *Untangling terrestrial and aquatic controls on carbon, nutrients, and microorganisms in Arctic stream networks*. **2018**. European Conference on Permafrost. Chamonix, France.
- <sup>(i)</sup>**BW Abbott**, T Kolbe, JR de Dreuzy, C Vautier, J Marçais, Zahra Thomas, F Moatar, L Aquilina, T Labasque, JP Zarnetske, C Lécuyer, G Pinay. **2018**. *Limits and location of denitrification at catchment scales: can hyporheic and riparian removal solve diffuse nutrient pollution?* Society for Freshwater Science. Detroit, Michigan.
- <sup>(i)</sup>**BW Abbott**, Z Aanderud, G Carling, N Hansen. **2018**. *Cultivating stewardship and improving water quality in the Utah Lake watershed*. Provo River Watershed Council. Orem, Utah.
- BW Abbott**, K Bishop, JP Zarnetske, C Minaudo, FS Chapin III, D Ellison, S Krause, DM Hannah, G Pinay. **2017**. *Global Water Cycle Diagrams Minimize Human Influence and Over-represent Water Security*. American Geophysical Union, Fall Meeting. New Orleans, Louisiana.

## Curriculum vitae Benjamin W. Abbott

- ① **BW Abbott**, G Grua, JP Zarnetske, F Moatar, G Pinay. **2017**. *Stable spatial patterns of nitrate in headwater stream networks allows identification and mitigation of critical source areas*. Managing Global Resources for a Secure Future. Tampa, Florida.
- ① **BW Abbott** **2017**. *Unexpected spatial stability of water chemistry in headwater stream networks*. Idaho State University Department of Geoscience Seminar. Pocatello, Idaho.
- ① **BW Abbott**, G Grua, JP Zarnetske, F Moatar, T Kolbe, G Pinay. **2017**. *Stable spatial structure and strong temporal synchrony of water quality in stream networks*. Gordon Research Conference, Catchment Science: Interactions of Hydrology, Biology, and Geochemistry. Lewiston, Maine.
- \*\*BW Abbott**, G Grua, JP Zarnetske, F Moatar, L Barbe, T Kolbe, S Gu, AC Pierson-Wickmann, P Davy, G Pinay. **2017**. *Stable spatial structure and strong temporal synchrony of water quality in stream networks*. HydroEco: ecology-hydrology-human interactions in a changing world. Birmingham, UK (Best oral presentation).
- ① **BW Abbott**. **2016**. *The biggest terrestrial tipping point or a potential carbon sink? 124 experts weigh in on the permafrost carbon feedback*. Chrono-Environnement Seminar at the Université de Franche-Comté. Besançon, France.
- ① **BW Abbott**. **2016**. *Using expert assessment to conceptualize climate-vegetation-wildfire interactions: constraining baselines, quantifying risk, and identifying key uncertainties*. Plenary talk at the Global Paleofire Workshop: Fire History Baselines by Biome. Bordeaux, France.
- BW Abbott**, G Pinay, G Gruau, J Zarnetske, Z Thomas, S Gu, T Kolbe, F Moatar, L Barbe, O Fovet, AC Pierson-Wickmann. **2016**. *Where and how often do we need to measure water quality to learn how to improve it?* 5<sup>th</sup> international EcoSummit; Ecological Sustainability: Engineering Change. Montpellier, France.
- BW Abbott**, JB Jones, JR Larouche, SE Godsey, AW Balsler. **2016**. *Lateral and vertical fluxes of carbon and nitrogen from upland thermokarst*. Eleventh International Conference On Permafrost (ICOP). Potsdam, Germany.
- ① **BW Abbott**, G Pinay, T Kolbe, J Marçais, G Gruau, T Labasque, L Aquilina, JR de Dreuzy, Z Thomas, Camille Vautier, Carolyn Oldham. **2016**. *Using multi-tracer inference to move beyond single-catchment ecohydrology*. Seminar at the University of Birmingham School of Biosciences and Geography.
- BW Abbott**, G Pinay, Z Thomas, T Kolbe, JR de Dreuzy, T Labasque, L Aquilina. **2015**. *Controls on carbon and nutrient dynamics in agricultural catchments across temporal and spatial scales*, seminar for the National Institute for Agricultural Research (INRA), Rennes, France.
- BW Abbott**, JB Jones, JR Larouche, WB Bowden, SE Godsey. **2015**. *Patterns and persistence of hydrological carbon and nutrient export from collapsing permafrost*, HydroEco. Vienna, Austria.
- BW Abbott**, JB Jones, MS Bret-Harte, FS Chapin III, EAG Schuur. **2015**. *Permafrost dans un monde qui se réchauffe : un écosystème en déséquilibre*, OSUR seminar. Rennes, France.
- EAG Schuur, **BW Abbott**. **2014**. *Expert assessment of vulnerability of carbon pools in the permafrost zone to climate change*, 3<sup>rd</sup> Carbon Pools in Permafrost (CAPP) workshop, Stockholm, Sweden.
- JE Vonk, **BW Abbott**, PJ Mann, JB Jones, JR Larouch, A Davydova, N Zimov, WB Bowden, RGM Spencer. **2014**. *Biodegradability of dissolved organic matter from collapsing permafrost in Siberia and Alaska*, 4<sup>th</sup> European Conference on Permafrost. Évora, Portugal.
- BW Abbott**, JB Jones, EAG Schuur, WB Bowden, FS Chapin III, H Epstein, M Flannigan, TK Harms, TN Hollingsworth, M Mack, SM Natali, AV Rocha, SE Tank, MR Turetsky, JE Vonk, KP Wickland. **2013**. *Can increased biomass offset carbon release from permafrost region soils, streams, and wildfire: an expert elicitation?* American Geophysical Union, Fall Meeting. San Francisco, California.

## Curriculum vitae Benjamin W. Abbott

- \*\*BW Abbott**, JB Jones, JR Larouche, WB Bowden. **2013**. *Dissolved organic carbon biodegradability from collapsing permafrost on the North Slope of Alaska*, Midnight Sun Science Symposium. Fairbanks, Alaska (2<sup>nd</sup> prize).
- BW Abbott**, JB Jones, JR Larouche, WB Bowden. **2012**. *Hydrologic and gaseous export of carbon and nitrogen from upland thermokarst features on the North Slope of Alaska*, Tenth International Conference on Permafrost (TICOP). Salekhard, Siberia.
- SE Godsey, **BW Abbott**. **2012**. *Interdisciplinary Permafrost Research*, Permafrost Young Researchers Network Workshop. Salekhard, Siberia.
- BW Abbott**, JB Jones, EAG Schuur. **2012**. *Carbon from the far north. When and how much*, Midnight Sun Science Symposium. Fairbanks, Alaska.
- <sup>(i)</sup>**\*\*BW Abbott**, EAG Schuur, JB Jones. **2011**. *Timing and magnitude of CO<sub>2</sub> and CH<sub>4</sub> release from the permafrost region: an expert elicitation*, American Geophysical Union, Fall Meeting. San Francisco, California (Outstanding Student Paper Award: Global Environmental Change).
- JL Larouche, **BW Abbott**, JB Jones, WB Bowden. **2011**. *Amount and lability of dissolved organic carbon entering arctic streams from landscapes disturbed by fire and thermokarst terrain, North Slope, Alaska*. American Geophysical Union, Fall Meeting. San Francisco, California.
- JB Jones, **BW Abbott**. **2011**. *Hydrobiogeochemistry of the Arctic System: Climate Change and the Impacts of Permafrost Thaw on Stream Hydrology and Elemental Fluxes*. Introduction to Changing Permafrost in the Arctic Landscape, online lecture series.
- BW Abbott**, JB Jones, TK Harms. **2011**. *How much carbon and nitrogen come out of a thermokarst and why?* Arctic System Science Thermokarst Project online seminar.
- BW Abbott**, JB Jones. **2010**. *Carbon export from thermokarst features on the North Slope*, Biology Graduate Student Symposium. Fairbanks, Alaska.
- \*\*BW Abbott**, WA Wurtsbaugh. **2008**. *Nutrient limitation in Cutler Reservoir: will phosphorus reduction affect eutrophication*, Spring Runoff Conference. Logan, Utah (2<sup>nd</sup> prize).

### Scientific posters

- <sup>(s)</sup>SS Sayedi, **BW Abbott**, J Frederick, BF Thornton, J Vonk, P Overduin, A Maslakov, EAG Schuur, T Zhang, CC Mu, AD McGuire, K Schreiner, JD Joo, E Pizhankova, A Gavrilov, JP Zarnetske, K Schaefer. *Expert assessment of subsea permafrost and related emissions* (2018), American Geophysical Union Fall Meeting. Washington DC.
- <sup>(s)</sup>RJ Frei, **BW Abbott**, R Dupas, S Gu, G Gruau, F Moatar, G Pinay, *Using biogeochemical tracers to quantify catchment resilience to nutrient loading*. Salt lake City Watershed Symposium (2018).
- <sup>(s)</sup>RJ Frei, **BW Abbott**, R Dupas, S Gu, G Gruau, F Moatar, G Pinay, *Constraining resilience: common flowpaths or stoichiometric controls on DOC and NO<sub>3</sub><sup>-</sup> concentrations?* (2018), Utah State University Spring Runoff Conference. Logan, Utah.
- BW Abbott**, EAG Schuur, JB Jones, FS Chapin III, and the Permafrost Carbon Network (2015), *Arctic and boreal biomass offsets little or none of permafrost carbon release from soils, streams, and wildfire*. Krycklan Symposium. Umeå, Sweden.
- <sup>(i)</sup>**BW Abbott**, EAG Schuur, JB Jones, FS Chapin III, and the Permafrost Carbon Network (2015), *The biggest terrestrial tipping point or a potential carbon sink? 124 experts weigh in on the permafrost carbon feedback*. Our Common Future under Climate Change. Paris, France.
- T Kolbe, **BW Abbott**, Z Thomas, JR de Dreuzy, C Vautier, T Labasque, L Aquilina, G Pinay (2015), *Coupling 3D groundwater modelling with CFC-based age dating to evaluate residence time distribution in the aquifer of an agricultural catchment*, HydroEco. Vienna, Austria.
- M Fritz, **BW Abbott**, N Belova, E Altug, D Frolov, J Lepage, Y Ma, A Morgenstern, M Oliva, A Schneider, J Stanilovskaya, S Tomaskovicova, A Niewendam (2014), *The Permafrost Young Researchers Network (PYRN): Integrating priorities for permafrost research over the next generation*, 4<sup>th</sup> European Conference on Permafrost. Évora, Portugal.

## Curriculum vitae Benjamin W. Abbott

- \*\*BW Abbott**, JB Jones, JR Larouche, WB Bowden (2013), *Carbon and nitrogen release from thawing permafrost: upland thermokarst*, Midnight Sun Science Symposium. Fairbanks, Alaska (1<sup>st</sup> prize).
- BW Abbott**, JB Jones, JR Larouche, WB Bowden (2012), *Carbon and nitrogen release from thawing permafrost: the biogeochemical physiology of upland thermokarst*, American Geophysical Union, Fall Meeting. San Francisco, California.
- BW Abbott**, JB Jones, JR Larouche, WB Bowden (2011), *The effects of thermokarst on terrestrial-aquatic linkages and stream chemistry in Arctic Alaska*, North American Benthological Society Annual Meeting. Providence, Rhode Island.
- BW Abbott**, JB Jones, TK Harms (2010), *Impacts of thermokarst formation on soil carbon dynamics on the North Slope of Alaska*, American Geophysical Union, Fall Meeting. San Francisco, California.

### Proposals and grants

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- Utah DWR. St Clair. Abbott, *Megafire impacts on terrestrial and aquatic ecosystems and management interventions to protect wildlife habitat and watershed hydrology*. \$497,946. **Funded**, 2019.
- NSF ANS. Abbott, Zarnetske, Shogren, O'Donnell, Bowden, *COLLABORATIVE RESEARCH - Constraining fate and function of permafrost nutrients with direct multi-scale observations: Stream networks as indicators of watershed processes*. \$1.34 million, \$469,943 to Abbott. **Pending**.
- NSF MathBio. Sudakov, Abbott, and Aanderud, *Collaborative research: Stochastic modeling of microbial dynamics during soil disturbance*. \$215,471. **Pending**
- Roger and Victoria Sant Educational Endowment for a Sustainable Environment. Abbott, Aanderud, Carling, Hansen, and Frandsen, *Cultivating stewardship and improving water quality in the Utah Lake watershed*. \$10,000. **Pending**
- NSF DEB RAPID. Abbott and St Clair, *The effects of mega-fires on ecosystem succession and resilience to continued disturbance in the western U.S.* \$200,000. Declined, 2018
- NSF SitS. Abbott, Sudakov, and Aanderud, *Stochastic models of soil disturbance and microbial dynamics: predicting permafrost climate feedbacks*. \$299,000. Not invited for full proposal, 2018
- DOE. Abbott, Zarnetske, Bowden, and O'Donnell, *Constraining the fate and function of permafrost nutrients with direct multi-scale observations*. \$299,927. Declined, 2018
- NSF EPSCoR Research Infrastructure Improvement. Godsey and Abbott, *Water Quality in the West*. \$10,000. **Funded**, 2018
- BYU Graduate School, High Impact Doctoral Research Assistantship. Sayedi and Abbott, *Combining expert opinions to assess risk of dangerous change in Earth Systems: permafrost collapse, global wildfire, and water security*. \$90,000. **Funded**, 2018
- Arctic Data Center and NCEAS. Brothers et al. (including Abbott), *From NEP to TEK: Linking biogeochemical predictions to environmental observations in northern communities*. \$54,600. Call was cancelled, 2018
- DOE. Frederick, Abbott, and Thornton, *Size and vulnerability of subsea permafrost carbon stocks: an expert assessment*. \$120,000. Not invited for full proposal, 2017
- DOE. Aanderud, Sudakov, and Abbott, *Integrating microbial succession into simulations of the permafrost climate feedback with stochastic models*. \$298,000. Not invited for full proposal, 2017
- NSF ANS. Sudakov and Abbott, *Stochastic modeling and analysis of abrupt change in permafrost ecosystems: connecting microbiology, vegetation, and climate*. \$300,000. Declined, 2018

## Curriculum vitae Benjamin W. Abbott

- Roger and Victoria Sant Educational Endowment for a Sustainable Environment. Abbott, Aanderud, Carling, and Hansen, *Cultivating stewardship and improving water quality in the Utah Lake watershed*. \$10,000. Declined, 2017
- Thomas Jefferson Fund, Dupas and Abbott, *Leveraging new data streams to improve understanding and management of freshwater ecosystems in a changing world*. \$20,000. Declined, 2017
- Agence Nationale de la Recherche. Gruau et al. (including Abbott), *Headwater catchment controls on the stoichiometry and ecological impacts of nutrient fluxes (HEADWATER)*. €501,000. Declined, 2017
- Institut Polaire Français. Pétilion, Marguerie, Vernon, van Baaren, Francez, Pinay, and Abbott, *Impacts of climatic and environmental changes on functioning and diversity of Arctic Canadian ecosystems (ICE-Canada)*. \$150,000. Declined, 2016
- Agence Nationale de la Recherche. Aquilina et al. (including Abbott), *Environment Lab: a laboratory for ecological transition*. €10,141,912. Declined, 2016
- Agence Nationale de la Recherche. Davy et al. (including Abbott), *Environment Lab: eLABo*. €1,200,000. Declined, 2016
- NSF-EAR Postdoctoral Fellowship. Abbott, *Dissolved organic matter bioavailability regulates carbon export from the critical zone*. Declined, 2016

### Teaching and advising experience

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#### Teaching:

Advanced Data Analysis and Writing (BYU)	2019
Introduction to Environmental Biology (BYU)	2018
Watershed Ecology (BYU)	2018
Teaching assistant, <i>Microbiology</i> (UAF)	2014
Instructor, <i>Ecological Background for Resilience and Adaptation</i> , (UAF)	2012
Instructor, <i>Changing permafrost in the arctic landscape</i> , (UAF online course)	2011
Teaching fellow, <i>Oceanography</i> (USU)	2007

#### Guest lecturer:

<i>Charles Redd Center for Western Studies (Brigham Young University)</i>	2018
<i>Climate Change (Utah Valley University)</i>	2017/18
<i>Wetlands (Université de Rennes 1)</i>	2016
<i>Landscape ecology (Université de Rennes 2)</i>	2015
<i>Microbiology (UAF)</i>	2014
<i>Principles of Ecology and Methods for Interdisciplinary Research (UAF)</i>	2012/13
<i>Stream Ecology (UAF)</i>	2011
<i>Plant ecophysiology (UAF)</i>	2010

#### Graduate students advised (4 M.S., 2 Ph.D.):

- Sara Sayedi, Ph.D. adviser, *Combining expert opinion to assess risk of dangerous change in Earth systems: permafrost collapse, global wildfire, and water security* (2018, BYU)
- Trevor Crandall, M.S. Adviser, *Water quality in semi-arid ecosystems: wildfire and wastewater in the western U.S.* (2018, BYU)
- Camille Vautier, Ph.D. co-adviser, *Biological degradation at hydrological interfaces* (2016, ECOBIO Rennes)
- Adélaïde Duval, M.S. co-adviser, *How do microbial community and biogeochemical fluxes respond to different land use histories?* (2016, ECOBIO/OSUR Rennes)
- Charly David, M.S. co-adviser, *Dynamic imaging of hydrological exchange and degradation at river-groundwater interfaces* (2015, Géosciences Rennes and Agrocampus Ouest)

## Curriculum vitae Benjamin W. Abbott

Madiha Khadraoui, M.S. adviser, *Biogeochemical characterization of denitrification in agricultural landscapes* (2015, ECOBIO/OSUR Rennes)

### Undergraduate students advised (19 from 2017-present):

Rebecca Frei, Rachel Watts, Samuel Bratsman, Rhetta Shoemaker, Camila Vargas, Nicholas Suiter, Andrew Luymes, Jansen Howe, Madeline Buhman, Elizabeth Peterson, Leika Patch, Leslie Lange, Isabella Errigo, Zak Webber, Amanda Huebner, Isaac St. Clair, Allie Tuttle, Cecily Nicoll, Audrey Stacey

### **Service**

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#### University, college, and department service

Department website committee	2018
Committee for the evaluation of undergraduate research	2018

#### Workshops and conferences organized

Organizing committee, *Society of Freshwater Sciences Annual Meeting* (2019, Salt Lake City, Utah)  
Session Chair, *American Geophysical Union Fall Meeting* (2018, Washington D.C.)

- *Advances in Monitoring and Modeling of Subsea Permafrost*

Board member of the International Scientific Committee for the *European Conference on Permafrost* (2018, Chamonix-Mont-Blanc, France)

Conference organizer, *Water Quality in the West* (2018, Pocatello, Idaho)

Session chair, *American Geophysical Union Fall Meeting* (2017, New Orleans, Louisiana)

- *Vulnerability of Permafrost Carbon to Climate Change*. EAG Schuur, BW Abbott
- *Linking catchment biogeochemistry and hydrology to understand freshwater landscapes in the Anthropocene*. T Burt, BW Abbott, F Worrall
- *Interdisciplinary Approaches to Conceptualizing Nonlinear Changes in Permafrost Landscapes*. M Turetsky, T Douglas, BW Abbott

Workshop organizer, *Where land becomes stream: connecting spatial and temporal scales to better understand and manage catchment ecosystems* (2017, Rennes, France)

Workshop organizer, *Connectivity in fractured landscapes: soils, streams, and subterranean circulation* (2016, Rennes, France)

Workshop organizer, *Interfaces Joint Field Experiment* (2016, Pleine-Fougères, France)

Workshop organizer, *Small Catchment Ecohydrology Workshop* (2015, Rennes, France)

Conference assistant, *Vulnerability of Permafrost Carbon Research Coordination Network Synthesis Workshop* (2011, Seattle, USA)

#### Graduate committee service (2 M.S., 3 Ph.D.)

Erin F. Jones, Ph.D., *Alternative stable states in Utah Lake* (2017, BYU, Plant and Wildlife Sciences)

Scott Collins, M.S., *Population dynamics of cyanobacterial communities in harmful algal blooms on Utah Lake* (2017, BYU, Plant and Wildlife Sciences)

Natalie S. Barkdull, M.S., *Hydrological and biological response of high-mountain glaciers to climate change* (2017, BYU, Geological Sciences)

Jordan Maxwell, Ph.D., *Disturbance effects on ecosystem health and services in a mixed-aspen conifer forest* (2018, BYU, Plant and Wildlife Sciences)

Antoine Casquin, Ph.D., *Effects of landscape spatial structure on lateral C-N-P fluxes*, (2018, INRA, Agrocampus Ouest)

## Curriculum vitae Benjamin W. Abbott

### Reviewer for 38 international journals (103 reviews: <https://publons.com/author/1214688>)

Agriculture Ecosystems and Environment. Analytical Chemistry. Arctic, Antarctic, and Alpine Research. Arctic Science. Biogeochemistry. Biogeosciences. Biology and Fertility of Soils. Chemical Geology. Ecosystems. Environmental Science & Technology. Freshwater Science. Geophysical Research Letters. Global Biogeochemical Cycles. Global Change Biology. Hydrogeology Journal. Hydrological Processes. Hydrology and Earth System Sciences. Journal of Geophysical Research. Journal of Geophysical Research: Biogeosciences. Journal of Hydrology. Limnologica. Limnology and Oceanography. Microbial Ecology. Nutrient Cycling in Agroecosystems. PeerJ. Permafrost and Periglacial Processes. PLOS One. Progress in Physical Geography. Remote Sensing of Environment. Science Advances. Science of the Total Environment. Scientific Reports. Sedimentary Geology. The Cryosphere. Water Resources Research.

### Reviewer for 6 funding agencies

ArcticNet. AVOID 2. Earthwatch. I-SITE. Propolar. U.S. National Science Foundation.

### Other service

BYU representative to the Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUAHSI)	2018-Present
Planning Committee for the Society for Freshwater Sciences	2018-Present
Review Board member for Biogeochemistry	2017-Present
Guest Editor for Science of the Total Environment	2017-18
Guest Editor for Frontiers in Ecology and Evolution	2017-18
Public relations representative for the Brittany Armorique LTER	2014-16
Executive committee member Permafrost Young Researchers Network	2012-14
National representative for the USA in Permafrost Young Researchers Network	2011-14
Co-founder and executive committee chair of UAF Green Bikes program	2010-14
Translation editor for Russian submissions to the TICOP proceedings	2012
Web designer and organizer of the UAF Midnight Sun Science Symposium	2012
Fairbanks North Star Borough Outdoor Days radio telemetry station	2011
Co-chair of the UAF Review of Infrastructure, Sustainability, and Energy board	2010-13

### Scholarships and awards

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High Impact Doctoral Research Assistant Grant (Sara Sayedi)	2018
Office of Research and Creative Activities grant (Rebecca Frei)	2018
Innovation Working Group: Water Quality in the West	2018
Early Career Scientist Award (Arctic LTER)	2016-2017
Marie Curie fellowship	2014-16
Ted McHenry Biology Field Research Fund	2013-14
IAB Director's Travel Award	2013
College of Natural Science and Mathematics Travel Grant	2013
Graduate School Travel Grant	2013
UAF Dissertation Completion Fellowship	2013
Midnight Sun Science Symposium, 1 <sup>st</sup> and 2 <sup>nd</sup> prizes	2013
Mike Ardaw Trust Scholarship	2012-13
George Happ Biomedical Graduate Scholarship	2012-13
IAB Director's Travel Award	2012
AGU Outstanding Student Paper Award: Global Environmental Change	2011
United States Permafrost Association AGU travel grant	2011
W. Scott Parish Memorial Scholarship	2011-12

## Curriculum vitae Benjamin W. Abbott

Alaska EPSCoR travel grant	2010
UAF Office of Sustainability SIREN grant for UAF Green Bikes program	2010
USU Watershed Sciences Outstanding Senior	2009
Quinney Scholar Educational Enhancement Grant	2008
USU College of Humanities, Arts and Social Sciences, Hubbard Scholarship	2007-08
Undergraduate Research and Creative Opportunity grant	2007
Undergraduate Teaching Fellow of the Year: Utah State University	2007
USU College of Natural Resources, Quinney Scholarship	2002-08

### Outreach and media

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Author of blog: <a href="#">approximately limitless</a> .	2011-present
Director of the <a href="#">Utah Lake Collaborative</a> participatory science project	2018-present
Panelist: Wildfires, Drought, Air Pollution: The Growing Climate Crisis	2018
Scientific panel Utah Valley Earth Stewardship Forum on Utah Lake	2018
Scientific briefing for Congressman John Curtis	2018
Scientific panel for Citizen's Climate Lobby	2018
<a href="#">Global Arctic MOOC</a> , École Polytechnique Fédérale de Lausanne	2018
Scientific contributor for the <a href="#">Deseret News</a> and Salt Lake Tribune	2018
Scientific consultant for <a href="#">Tipping points</a> documentary by Unboxed media	2012-13
Scientific consultant for <a href="#">Climate Hunters</a> by Netherlands Public Broadcasting	2012-13
Contributor: <i>River Conservation: Challenges and Opportunities</i> , Fundación BBVA	2013
Journal cover photo, Journal of Plankton Research	2012 May
Contributor for <a href="#">Yale forum on Climate Change and the Media</a>	2012
Article, <i>Life in Fairbanks</i> , <a href="#">UAF website</a>	2010
Article, <i>America's Greenest Hotels: Where luxury meets ecology</i> , <a href="#">Forbes Traveler</a>	2008
Article, <i>The cost of living</i> , USU Natural Resources Almanac	2007

### Skills

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Languages: English (native speaker), French (fluent)

Field experience: More than 10 years' experience sampling water (rivers, soil water, precipitation, and groundwater), soil, surface and ground ice, vegetation, and gasses for biogeochemical analyses including stable and radioactive isotopes, fluxes of carbon, nitrogen, sediment, and other elements. Experience and safety certification in Arctic, desert, and agricultural environments.

Laboratory experience: More than 10 years' experience with analysis and experimentation including dissolved organic matter bioavailability, aerobic and anaerobic soil incubations, elemental analysis CNHS, mass spectrometry, gas chromatography, ion chromatography, dissolved and particulate carbon analysis, fluorometry, water isotope analysis, and diverse methods development.

Software and programming: Programming and visual design in R, MATLAB, Python, and Visual Basic. Database management with Microsoft Access and MySQL. Experience with MODFLOW, ModelMuse, QGIS, Whitebox, and ArcGIS. Competent in wide range of analyzer software (e.g. Costech, Dionex, Horiba, LI-COR, s::can).

Project management: Long-distance collaboration; development of quantitative surveys (expert assessment); workshop and conference organization; design and implementation of collaborative, long-term field campaigns; management of synthesis and meta-analysis projects.

## Curriculum vitae Benjamin W. Abbott

Statistics and modeling: Mixed-modeling, multiple regression, boosted regression trees, Bayesian inverse modeling, end member analysis, multivariate analysis, hydrological modeling, reactive transport modeling.