

Greg Balco

Berkeley Geochronology Center · 2455 Ridge Road · Berkeley CA 94709 USA
(510) 644-9200 · balcs@bgc.org

Education

University of Washington, Seattle, WA. Ph.D., Earth and Space Sciences, 2004. M.S., Applied Mathematics, 2004. Quaternary and glacial geology, surface processes, cosmogenic-nuclide geochemistry, quantitative geomorphology, GIS applications in geology. Advisor, Dr. John Stone.

University of Maine, Orono, ME. M.S., Geological Sciences, 1997. Coastal sedimentology, sea-level change, Quaternary and glacial geology, palaeoenvironmental reconstruction. Advisor, Dr. Dan Belknap.

Williams College, Williamstown, MA. B.A., magna cum laude, 1992. Advisor, Dr. David Dethier.

Princeton-YBRA Geology Field Camp, Red Lodge, MT. Summer 1991.

Academic appointments and related experience

Berkeley Geochronology Center. Geochronologist. 2008-present. Noble gas mass spectrometry, cosmogenic radionuclides and noble gases, U-Th/He and $^3\text{He}/^4\text{He}$ thermochronometry. Applications to geochronology and quantitative geomorphology.

University of California, Berkeley. Postdoctoral research fellow, 2007-2009.

University of Washington. NSF Polar Programs postdoctoral research fellow. 2005-2007. Glacial geology and geochronology of Antarctic ice sheets; Antarctic landscape evolution.

University of Washington. Research Associate. 2004-2007. Cosmogenic-nuclide systematics and applications to geochronology and erosion-rate measurement.

U.S. Antarctic program. 2000-present. Participant in nine and leader of three field expeditions to various remote Antarctic locations.

University of Washington. Graduate teaching assistant. 2001. Introductory Earth science courses.

University of Maine. Graduate teaching assistant. 1994-95. Introductory Earth science courses.

Other professional experience

United States House of Representatives Committee on Resources, Subcommittee on Fisheries Conservation, Wildlife, and Oceans. Washington, DC. Fellow (1997); legislative staff (1998). Researched and disseminated information for Members of Congress, produced press releases and articles, wrote speeches, organized hearings, and drafted legislation on fisheries, wildlife, oceanography, and marine policy.

JME Companies. Denver, CO, USA. Staff geologist. 1993-1994. Geologic and hydrologic investigations; drilling program management; resource estimation and mine planning; production planning; software development for various mining companies in the U.S. and Africa.

Fellowships

U.S. National Science Foundation Polar Programs postdoctoral research fellowship, 2005-2007.

Fannie and John Hertz Foundation Graduate Fellow, 1999-2003.

DOSECC Graduate Internship, 2002.

American Federation of Mineralogical Societies Graduate Fellowship, 2000-2001.

ARCS Fellowship, 1998-1999.

Greg Balco

Fellowships (continued)

Dean John A. Knauss Sea Grant Marine Policy Fellow, 1997-1998.

National Science Foundation Graduate Research Fellow, 1995-1999.

Awards

Fellow, Geological Society of America.

Geological Society of America, J. Hoover Mackin Award, 2002.

Geochron Laboratories Research Award, 1996.

Freeman Foote Prize in Geology, Williams College, 1992.

Bruce Sanderson, Class of 1956, Prize in Architecture, Williams College, 1992.

Class of 1960 Geology Scholar, Williams College, 1991-1992.

American Mineralogical Society Undergraduate Award, Williams College, 1991.

Phi Beta Kappa Society; Sigma Xi Society.

Professional service (last 5 years)

Journal editorial boards. Quaternary Geochronology.

Journal peer review. Reviewer for the following journals: *Science, Nature, Nature Geoscience, Earth and Planetary Science Letters, Geology, Geosphere, Quaternary Research, Quaternary Geochronology, Quaternary Science Reviews, Tectonics, Earth Surface Processes and Landforms, Journal of Geophysical Research, Journal of Quaternary Science, G-Cubed, Journal of Human Evolution, Geophysical Research Letters, Geological Society of America Bulletin.* Cited for excellence in reviewing by *EPSL* and *JGR-Earth Surface*.

Proposal review for funding agencies. Reviewer for the U.S. National Science Foundation, UK-Natural Environment Research Council, Deutsche Forschungsgemeinschaft, National Research Council Canada, and Israel Science Foundation. Review panel member, National Science Foundation Office of Polar Programs.

Other

Extensive training in emergency medicine and wilderness rescue (lapsed NREMT-B, WEMT). Professional ski patrol, Silvercreek Resort and Solvista Ski Ranch, Granby, CO, 1993-2003. Avalanche and winter backcountry travel instructor, Washington Alpine Club, Seattle, WA, 2001-2007. Accomplished carpenter, photographer, draftsman, and ski mountaineer (AAJ, v. 49, pp. 129-130).

Greg Balco – publications and products

Online geochronology tools

- [79] The Informal Cosmogenic-nuclide Exposure-age Database (ICE-D): <http://www.ice-d.org>
- [78] Online exposure-age and erosion-rate calculators: <http://hess.ess.washington.edu>
- [77] "Bleeding edge of cosmogenic-nuclide geochemistry" blog: <http://cosmognosis.wordpress.com>

Published

- [76] Rovey, C.W., Balco, G., Forir, M., Kean, W.F., 2017 in press. Stratigraphy, paleomagnetism and cosmogenic isotope burial dates of fossil-bearing strata within Riverbluff Cave, Greene County, Missouri. *Quaternary Research* 87, pp. 516-528.
- [75] Tremblay, M.M., Shuster, D.L., Balco, G., Cassata, W.S., 2017. Neon diffusion kinetics and implications for cosmogenic neon paleothermometry in feldspars. *Geochimica et Cosmochimica Acta* 205, pp. 14-30.
- [74] Balco, G., 2017. Production rate calculations for cosmic-ray-muon-produced ^{10}Be and ^{26}Al benchmarked against geological calibration data. *Quaternary Geochronology* 39, pp. 1-24.
- [73] Martin, L.C.P., Blard, P-H., Balco, G., Lavé, J., Delunel, R., Lifton, N., Laurent, V., 2017. The CREP program and the ICE-D production rate calibration database: a fully parameterizable and updated online tool to compute cosmic-ray exposure ages. *Quaternary Geochronology* 38, pp. 25-49.
- [72] Thompson, W.B., Dorion, C.C., Ridge, J.C., Balco, G., Fowler, B.K., Svendsen, K.M., 2017. Deglaciation and late-glacial climate change in the White Mountains, New Hampshire, USA. *Quaternary Research* 87, pp. 96-120.
- [71] Schaefer, J., Finkel, R.C., Balco, G., Alley, R.B., Caffee, M.W., Briner, J.P., Young, N.E., Gow, A.J., Schwartz, R., 2016. Greenland was nearly ice-free for extended periods during the Pleistocene. *Nature* 540, pp. 252-255.
- [70] Bibby, T., Putkonen, J., Morgan, D., Balco, G., Shuster, D.L., 2016. Million-year-old ice found under meter-thick debris layer in Antarctica. *Geophysical Research Letters* 43, pp. 6995-7001.
- [69] Balco, G., Todd, C., Huybers, K., Campbell, M., Vermeulen, M., Hegland, M., Goehring, B., Hillebrand, T.R., 2016. Cosmogenic-nuclide exposure ages from the Pensacola Mountains adjacent to the Foundation Ice Stream, Antarctica. *American Journal of Science* 316, pp. 532-577.
- [68] Marrero, S.M., Phillips, F.M., Borchers, B., Lifton, N., Aumer, R., Balco, G., 2016. Cosmogenic-nuclide systematics and the CRONUScalc program. *Quaternary Geochronology* 31, pp. 160-187.
- [67] Phillips, F.M., Argento, D.C., Balco, G., Caffee, M.W., Clem, J., Dunai, T.J., Finkel, R., Goehring, B., Gosse, J.C., Hudson, A.M., Jull, A.J.T., Kelly, M.A., Kurz, M., Lal, D., Lifton, N., Marrero, S.M., Nishiizumi, K., Reedy, R.C., Schaefer, J.M., Stone, J.O.H., Swanson, T., Zreda, M.G., 2016. The CRONUS-Earth project: a synthesis. *Quaternary Geochronology* 31, pp. 119-154.
- [66] Borchers, B., Marrero, S., Balco, G., Caffee, M., Goehring, B., Lifton, N., Nishiizumi, K., Phillips, F., Schaefer, J., Stone, J., 2016. Geological calibration of spallation production rates in the CRONUS-Earth project. *Quaternary Geochronology* 31, pp. 188-198.
- [65] Schaefer, J.M., Wincker, G., Blard, P-H., Balco, G., Shuster, D.L., Friedrich, R., Jull, A.J.T., Wieler, R., Schluechter, C., 2016. Performance of CRONUS-P: a pyroxene reference material for helium isotope analysis. *Quaternary Geochronology* 31, pp. 237-239.
- [64] Balco, G., 2015. The absence of evidence of absence of the East Antarctic Ice Sheet. *Geology* 43, pp. 943-944.

- [63] DeJong, B.D., Bierman, P.R., Newell, W.L., Rittenour, T.M., Mahan, S.A., Balco, G., Rood, D.H., 2015. Pleistocene relative sea levels in the Chesapeake Bay region and their implications for the next century. *GSA Today* 25.
- [62] Soreghan, G.S., Sweet, D.E., Thomson, S.N., Kaplan, S.A., Marra, K.R., Balco, G., Eccles, T.M., 2015. Geology of Unaweep Canyon and its role in the drainage evolution of the northern Colorado Plateau. *Geosphere* 11, pp. 320-341.
- [61] Blard, P.-H., Balco, G., Burnard, P.G., Farley, K.A., Fenton, C.R., Friedrich, R., Jull, A.J.T., Niedermann, S., Pik, R., Schaefer, J.M., Scott, E.M., Shuster, D.L., Stuart, F.M., Stute, M., Tibari, B., Winckler, G., Zimmermann, L., 2015. An inter-laboratory comparison of cosmogenic ^3He and radiogenic ^4He in the CRONUS-P pyroxene standard. *Quaternary Geochronology* 26, pp. 11-19.
- [60] Vermeesch P., Balco G., Blard P.-H., Dunai T.J., Kober F., Niedermann S., Shuster D.L., Strasky S., Stuart F.M., Wieler R., Zimmermann L., 2015. Interlaboratory comparison of cosmogenic Ne-21 in quartz. *Quaternary Geochronology* 26, pp. 20-28.
- [59] Fox, M., Leith, K., Bodin, T., Balco, G., Shuster, D.L., 2015. Rate of fluvial incision in the Central Alps constrained through joint inversion of detrital ^{10}Be and thermochronometric data. *Earth and Planetary Science Letters* 411, pp. 27-36.
- [58] Rovey C.W., Balco, G., 2015. Paleoclimatic interpretations of buried paleosols within the pre-Illinoian till sequence in northern Missouri, USA. *Palaeogeography, Palaeoclimatology, Palaeoecology* 417, pp. 44-56.
- [57] Balco, G., Stone, J.O.H., Sliwinski, M.G., Todd, C., 2014. Features of the glacial history of the Transantarctic Mountains inferred from cosmogenic ^{26}Al , ^{10}Be , and ^{21}Ne concentrations in bedrock surfaces. *Antarctic Science* 26, pp. 708-723.
- [56] Tremblay, M.M., Shuster, D.L., Balco, G., 2014. Diffusion kinetics of ^3He and ^{21}Ne in quartz and implications for cosmogenic noble gas paleothermometry. *Geochimica et Cosmochimica Acta* 142, pp. 186-204.
- [55] Tremblay, M.M., Shuster, D.L., Balco, G., 2014. Cosmogenic noble gas paleothermometry. *Earth and Planetary Science Letters* 400, pp. 195-205.
- [54] Putkonen, J., Morgan, D., Balco, G., 2014. Boulder weathering in McMurdo Dry Valleys, Antarctica. *Geomorphology* 219, pp. 192-199.
- [53] Johnson, J.S., Bentley, M.J., Smith, J.A., Finkel, R.C., Rood, D.H., Gohl, K., Balco, G., Larter, R., Schaefer, J.M., 2014. Rapid thinning of Pine Island Glacier in the early Holocene. *Science* 343, pp. 999-1001.
- [52] Dethier D., Ouimet W., Bierman P.R., Rood D., Balco G., 2014. Basins and bedrock: spatial variation in ^{10}Be erosion rates and increasing relief in the southern Rocky Mountains, USA. *Geology* 42, pp. 167-170.
- [51] Balco G., 2014. Simplified computer code for estimating cosmic-ray shielding due to oddly shaped objects. *Quaternary Geochronology* 22, pp. 175-182.
- [50] Altman, N.S., Balco, G., Crainiceanu, C., Gehrels, W.R., Qiu, J., Staudenmayer, J., Sullivan, P., 2013. Statistical modeling of changes in relative sea level in Maine during the Holocene Era. *Environmetrics* 24, pp. 298-305.
- [49] Balco G., Finnegan N., Gendaszek A., Stone J.O.H., Thompson N., 2013. Erosional response to northward-propagating crustal thickening in the coastal ranges of the U.S. Pacific Northwest. *American Journal of Science* 313, pp. 790-806.
- [48] Balco G., Soreghan G.S., Sweet D.E., Marra K.R., Bierman P.R., 2012. Cosmogenic-nuclide burial ages for Pleistocene sedimentary fill in Unaweep Canyon, Colorado, USA. *Quaternary Geochronology* 18, pp. 149-157.
- [47] Jungers M.C., Heimsath A.M., Amundson R., Balco G., Shuster D., Chong G., 2012. Active erosion-deposition cycles in the hyperarid Atacama Desert of northern Chile. *Earth and Planetary Science Letters* 371-272, pp. 125-133.

- [46] Finnegan N.J., Balco G., 2013. Sediment supply, base level, braiding, and bedrock river terrace formation: Arroyo Seco, California, USA. *Geological Society of America Bulletin*, B30727.1.
- [45] Campbell S., Balco G., Todd C., Conway H., Huybers K., Simmons C., Vermeulen M., 2013. Radar-detected englacial stratigraphy in the Pensacola Mountains, Antarctica: implications for recent changes in ice flow and accumulation. *Annals of Glaciology* 54, pp. 91-100.
- [44] Balco G., Schaefer J.M., LARISSA group, 2013. Exposure-age record of Holocene ice sheet and ice shelf change in the northeast Antarctic Peninsula. *Quaternary Science Reviews* 59, pp. 101-111.
- [43] Ridge J., Balco G., Bayless R.L., Beck C.C., Carter L.B., Dean J.L., Voytek E.B., Wei J.H., 2012. The new North American Varve Chronology: a precise record of southeastern Laurentide Ice Sheet deglaciation and climate, 18.2-12.5 kyr BP, and correlations with Greenland ice core records. *American Journal of Science* 312, pp. 685-722.
- [42] Putkonen J., Morgan D., Balco G., 2012. Regolith transport quantified by braking block, McMurdo Dry Valleys, Antarctica. *Geomorphology*, v. 155, pp. 80-87.
- [41] Gourbet L., Shuster D.L., Balco G., Cassata W.S., Renne P.R., Rood D., 2012. Neon diffusion kinetics in olivine, pyroxene, and feldspar: retentivity of cosmogenic and nucleogenic neon. *Geochimica et Cosmochimica Acta*, v. 86, pp. 21-36.
- [40] Shuster D.L., Farley K.A., Vasconcelos P.M., Balco G., Monteiro H.S., Waltenberg K., Stone J.O., 2012. Cosmogenic He-3 in hematite and goethite from Brazilian "canga" duricrust demonstrates the extreme stability of these surfaces. *Earth and Planetary Science Letters* v. 329-330, pp. 41-50.
- [39] Renne P., Balco G., Ludwig K., Mundil R., Min K., 2011. Response to the comment by W.H. Schwarz et al. on "Joint determination of K-40 decay constants and Ar-40*/K-40 for the Fish Canyon sanidine standard, and improved accuracy for Ar-40/Ar-39 geochronology" by P.R. Renne et al. (2010). *Geochimica et Cosmochimica Acta*, v. 75, pp. 5097-5100.
- [38] Rovey C.W., II, Balco G., 2011. Summary of early and middle Pleistocene glaciations in northern Missouri, USA. in Ehlers, J., Gibbard, P.L., Hughes, P.D., eds., *Quaternary Glaciations, Extent and Chronology*, pp. 553-561.
- [37] Balco G., Purvance M., Rood D., 2011. Exposure dating of precariously balanced rocks. *Quaternary Geochronology* 6, pp. 295-303
- [36] Shuster D.L., Cuffey K.M., Sanders J.W., Balco G., 2011. Thermochronometry reveals headward propagation of erosion in an alpine landscape. *Science* 332, pp. 84-88.
- [35] Balco G., 2011. Contributions and unrealized potential contributions of cosmogenic-nuclide exposure dating to glacier chronology, 1990-2010. *Quaternary Science Reviews*, v. 30, pp. 3-27 (invited review paper)
- [34] Farley K.A., Shuster D.L., Watson E.B., Wanser K.H., Balco G., 2010. Numerical investigations of apatite He-4/He-3 thermochronometry. *G-cubed*, v. 11, doi:10.1029/2010GC003243.
- [33] Rovey C.W., II, Bettis, E.A., III, Balco, G., Kean, W.F., 2010. A paleomagnetic reversal within the pre-Illinoian Alburnett Formation, eastern Iowa. in Marshall, T. and Fields, C., eds., *The Geology of Klein and Conklin Quarries, Johnson County, Iowa: Geological Society of Iowa Guidebook* 87, pp. 161-172.
- [32] Morgan D., Putkonen J., Balco G., Stone J., 2010. Quantifying regolith erosion rates with cosmogenic nuclides Be-10 and Al-26 in the McMurdo Dry Valleys, Antarctica. *Journal of Geophysical Research - Earth Surface* 115, p. F03037.
- [31] Morgan D., Putkonen J., Balco G., Stone J., 2010. Degradation of glacial deposits quantified with cosmogenic nuclides, Quartermain Mountains, Antarctica. *Earth Surface Processes and Landforms*.
- [30] Balco G., Rovey C.W., II., 2010. Absolute chronology for major Pleistocene advances of the Laurentide Ice Sheet. *Geology* 38, pp. 795-798.

- [29] Renne P.R., Mundil R., Balco G., Min K., Ludwig K.R., 2010. Joint determination of K-40 decay constants and Ar-40*/K-40 for the Fish Canyon sanidine standard, and improved accuracy for Ar-40/Ar-39 geochronology. *Geochimica et Cosmochimica Acta* 74, pp. 5349-5367.
- [28] Goehring, B., Kurz, M.D., Balco, G., Schaefer, J.M., Licciardi, J., Lifton, N., 2010. A reevaluation of in-situ cosmogenic He-3 production rates. *Quaternary Geochronology* 5, pp. 410-418.
- [27] Rovey, C.W., II, Forir, M., Balco, G., Gaunt, D., 2010. Geomorphology and paleontology of Riverbluff Cave, Springfield, Missouri, in Evans, K.R. and Aber, J.S., eds., *From Precambrian Rift Volcanoes to the Mississippian Shelf Margin: Geological Field Excursions in the Ozark Mountains: Geological Society of America Field Guide* 17, pp. 31-38.
- [26] Schildgen T.F., Balco G., Shuster D.L., 2010. Canyon incision and knickpoint propagation recorded by apatite He-4/He-3 thermochronometry. *Earth and Planetary Science Letters* 293, pp. 377-387.
- [25] Shuster D.L., Balco G., Cassata W.S., Fernandes V.A., Garrick-Bethell I., Weiss B.P., 2010. A record of impacts preserved in the lunar regolith. *Earth and Planetary Science Letters* 290, pp. 155-165.
- [24] Rovey, C.W., II, Balco, G., 2010. Periglacial climate at the 2.5 Ma onset of Northern Hemisphere glaciation inferred from the Whippoorwill formation, northern Missouri, USA. *Quaternary Research* 73, pp. 151-161.
- [23] Balco G., Shuster D.L., 2009. Al-26 - Be-10 - Ne-21 burial dating. *Earth and Planetary Science Letters* 286, p. 570.
- [22] Balco G., 2009. The geographic footprint of glacier change. *Science* (invited Perspective) 324, p. 599.
- [21] Balco, G. Shuster, D.L., 2009. Production rate of cosmogenic Ne-21 in quartz estimated from Be-10, Al-26 and Ne-21 concentrations in slowly eroding Antarctic bedrock surfaces. *Earth and Planetary Science Letters* 281, pp. 48-58.
- [20] Balco G., Briner J., Finkel R.C., Rayburn J., Ridge J.C., Schaefer J.M., 2009. Regional beryllium-10 production rate calibration for late-glacial northeastern North America. *Quaternary Geochronology* 4, pp. 93-107.
- [19] Balco G., Rovey C.W., II, 2008. An isochron method for cosmogenic-nuclide dating of buried soils and sediments. *American Journal of Science* 308, pp. 1063-1114.
- [18] Putkonen J., Balco G., Morgan D., 2008. Slow regolith degradation without creep determined by cosmogenic nuclide measurements in Arena Valley, Antarctica. *Quaternary Research* 69, pp. 242-249.
- [17] Balco G., Stone J., Lifton N., Dunai T., 2008. A complete and easily accessible means of calculating surface exposure ages or erosion rates from ¹⁰Be and ²⁶Al measurements. *Quaternary Geochronology* 3, pp. 174-195.
- [16] Jennings C.E., Aber J.S., Balco G., Barendregt R., Bierman P.R., Rovey C.W., Roy M., Thorleifson L.H., Mason J.A., 2007. Glaciations: mid-Quaternary in North America. in Elias S.A., ed., *Encyclopedia of Quaternary Science*. Volume 2, pp. 1044-1051.
- [15] Balco, G., 2007. A surprisingly large marine ice cap at Heard Island during the Last Glacial Maximum? in Antarctica: A Keystone in a Changing World – Online Proceedings of the 10th ISAES, edited by A.K. Cooper and C.R. Raymond et al., USGS Open-File Report 2007-1047, Extended Abstract 147.
- [14] Putkonen J., Rosales M., Turpen N., Morgan D., Balco G., Donaldson M., 2007. Regolith transport in the Dry Valleys of Antarctica. in Antarctica: A Keystone in a Changing World – Online Proceedings of the 10th ISAES, edited by A. K. Cooper and C. R. Raymond et al. USGS Open-File Report 2007-1047, Short Research Paper 103.
- [13] Balco, G., Schaefer, J., 2006. Cosmogenic-nuclide and varve chronologies for the deglaciation of southern New England. *Quaternary Geochronology* 1, pp. 15-28.

- [12] Balco, G., Cowdery, S., Todd, C., Stone, J.O.H., 2006. Antarctic ice sheet reconstruction using cosmic-ray-produced nuclides. in Knight, P., ed., *Glaciers and Earth's Changing Environment.*, pp. 221-223. Blackwell Publishing, Oxford, UK.
- [11] Balco, G., Stone, J.O.H., 2005. Measuring middle Pleistocene erosion rates with cosmic-ray-produced nuclides in buried alluvial sediment, Fisher Valley, southeastern Utah. *Earth Surface Processes and Landforms* 30, pp. 1051-1067.
- [10] Balco, G., Stone, J.O.H., Mason, J., 2005. Numerical ages for Plio-Pleistocene glacial sediment sequences by Al-26/Be-10 dating of quartz in buried paleosols. *Earth and Planetary Science Letters* 232, pp. 179-191.
- [9] Sugden D., Balco G., Cowdery S., Stone J.O.H., Sass L., 2005. Selective glacial erosion and weathering zones in the coastal mountains of Marie Byrd Land, Antarctica. *Geomorphology* 67, pp. 317-334.
- [8] Balco, G., Stone, J.O.H., Jennings, C., 2005. Dating Plio-Pleistocene glacial sediments using the cosmic-ray-produced radionuclides Be-10 and Al-26. *American Journal of Science* 305, pp. 1-41.
- [7] Balco, G., Rovey, C.W., Stone, J.O.H., 2005. The First Glacial Maximum in North America. *Science* 307, p. 222.
- [6] Stone, J.O.H., Balco, G., Sugden, D., Caffee, M., Sass, L.C. III, Cowdery, S., Siddoway, C., 2003. Holocene deglaciation of Marie Byrd Land, West Antarctica. *Science* 299, p. 99.
- [5] Balco, G., Stone, J.O.H., Porter, S.C., Caffee, M., 2002. Cosmogenic-nuclide ages for New England coastal moraines, Marthas Vineyard and Cape Cod, Massachusetts, USA. *Quaternary Science Reviews* 21, pp. 2127-2135.
- [4] Montgomery, D., Balco, G., Willett, S., 2001. Climate, tectonics, and the morphology of the Andes. *Geology* 29, pp. 579-582.
- [3] Dorion, C.C., Balco, G., Kaplan, M.R., Kreutz, K.J., Wright, J., Borns, H.W., 2001. The Deglaciation of Eastern Maine. in Retelle, M. and Weddle, T., eds., *Deglacial History and Relative Sea-Level Changes, Northern New England and Adjacent Canada: Geological Society of America Special Paper* 351.
- [2] Balco, G., Belknap, D.F., and Kelley, J.T., 1998. Glacioisostasy and lake-level change, Moosehead Lake, Maine. *Quaternary Research* 49, pp. 157-170

Dissertation

- [1] Balco, G. 2004. The sedimentary record of subglacial erosion by the Laurentide Ice Sheet. Ph.D. thesis, University of Washington, Seattle, WA.