

## Christoph E. Geiss

Associate Professor of Physics and Environmental Sciences

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### Education

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| 1994 – 1999 | <b>University of Minnesota</b>   | <b>Minneapolis, Minnesota</b> |
|             | Awarded PhD in geophysics, minoring in Quaternary paleoecology.            |                               |
| 1987 – 1994 | <b>Ludwig Maximilians Universität</b>                                      | <b>Munich, Germany</b>        |
|             | Awarded Diplom (German equiv. to MS) in geophysics, minoring in astronomy. |                               |
| 1990 - 1991 | <b>Wayne State University</b>  | <b>Detroit, Michigan</b>      |
|             | Exchange student, mostly course work in physics, some geology classes.     |                               |

### Research and Teaching Experience

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| 2015 – present | <b>Trinity College</b>  | <b>Hartford, Connecticut</b>  |
|                | Professor of Physics and Environmental Science  |                               |
| 2007 – 2015    | <b>Trinity College</b>  | <b>Hartford, Connecticut</b>  |
|                | Associate Professor of Physics and Environmental Sciences   |                               |
| 2001 - 2007    | <b>Trinity College</b>  | <b>Hartford, Connecticut</b>  |
|                | Assistant Professor of Physics, teaching Physics and Environmental Science courses  |                               |
| Fall 2000      | <b>Carleton College</b>   | <b>Northfield, Minnesota</b>  |
|                | Visiting Assistant Professor of Geology, taught <i>Introductory Geology</i> (lecture and field based exercises)   |                               |
| Fall 1999      | <b>St. Olaf College</b>   | <b>Northfield, Minnesota</b>  |
|                | Assistant Professor of Physics, taught <i>Introductory Geophysics</i> (lecture and field trips)   |                               |
| 1999 – 2001    | <b>University of Minnesota</b>  | <b>Minneapolis, Minnesota</b> |
|                | Postdoctoral associate at the Institute for Rock Magnetism.<br>Characterizing magnetic properties of lake sediments and soils, reconstructing climate from Alaska and the Midwestern United States. |                               |

## Research Interests

- Magnetic analysis of sediments and soils to reconstruct past environmental change. Work includes analysis of modern and buried soils in the Midwestern U.S., analysis of lake sediments and soils from northern Manitoba and Upstate New York
- The role of grass fires in the formation of magnetic minerals in prairie soils. Work includes study sites in Kansas and Iowa.
- Rates of soil formation and magnetic property development.  
A long-term study of soil erosion and soil development in western Iowa.

## Peer-reviewed Publications

(underlined authors are Trinity undergraduate students)

- Umbanhowar Jr, C.E., Camill, P., Edlund, M.B., **Geiss, C.E.**, Henneghan, P., Passow, K., 2014. Lake-landscape connections at the forest-tundra transition of northern Manitoba. *Inland Waters*, accepted for publication.
- Geiss, C. E.** 2014. "Does Timing or Location Matter? The Influence of Site Variability and Short-Term Variations in Precipitation on Magnetic Enhancement in Loessic Soils." *Geoderma*. 10.1016/j.geoderma.2014.03.020, 2014
- Roman, Stephani A., W. C. Johnson and **C. E. Geiss**. 2013. "Grass Fires - an Unlikely Process to Explain the Magnetic Properties of Prairie Soils." *Geophysical Journal International* doi: 10.1093/gji/ggt349.
- Ghanbarpour, M.R., Zolfaghari, S., **Geiss, C.E.** & Darvari, Z., 2013. Investigation of river flow alterations using environmental flow assessment and hydrologic indices: Tajan River watershed, Iran, *International Journal of River Basin Management*, DOI: 10.1080/15715124.2013.823978.
- Umbanhowar Jr, C., Camill, P., Edlund, M., **Geiss, C.**, Durham, W., Kreger, D., Molano, W., Raskob, C., Stocker, M., Tvera, A. & Williams, J., 2013. Contrasting changes in surface waters and barrens over the past 60 years for a subarctic forest-tundra site in northern Manitoba based on remote sensing imagery, *Canadian Journal of Earth Sciences*, 50, 967-977.
- Camill, P., Umbanhowar Jr, C.E., **Geiss, C.E.**, Hobbs, W.O., Edlund, M.B., Shinneman, A.C., Dorale, J.A. & Lynch, J., 2012. Holocene climate change and landscape development from a low-Arctic tundra lake in the western Hudson Bay region of Manitoba, Canada, *J. Paleolimnol.*, 48, 175-192.
- Quinton, E.E., Dahms, D.E. & **Geiss, C.E.**, 2011. Magnetic analyses of soils from the Wind River Range, Wyoming, constrain rates and pathways of magnetic enhancement for soils from semiarid climates, *Geochem. Geophys. Geosyst.*, 12, doi: 10.1029/2011GC003728.

- Schwalb, A., Dean, W.E., Fritz, S.C., **Geiss, C.E.** & Kromer, B., 2010. Centennial eolian cyclicity in the Great Plains, USA: A dominant climate pattern of wind transport over the past 4000 years?, *Quat. Sci. Rev.*, 29, 2325-2339.
- Geiss, C.E.**, Egli, R. & Zanner, C.W., 2008. Direct estimates of pedogenic magnetite as a tool to reconstruct past climates from buried soils., *J. Geophys. Res.*, 113, doi:10.1029/2008JB005669.
- Geiss, C.E.** & Zanner, C.W., 2007. Sediment magnetic signature of climate in modern loessic soils from the Great Plains, *Quat. Int.*, 162-163, 97-110.
- Machac, T.A., Zanner, C.W. & **Geiss, C.E.**, 2007. Time dependent IRM acquisition as a tool to quantify the abundance of ultra-fine superparamagnetic magnetite in loessic soils, *Geophys. J. Int.*, 169, 483-489.
- Geiss, C.E.** & Zanner, C.W., 2006. How abundant is pedogenic magnetite: Abundance and grain-size estimates for loessic soils based on rock-magnetic analyses, *J. Geophys. Res.*, 111, B12S21, doi:10.1029/2006JB004564.
- Guyodo, Y., LaPara, T.M., Anschutz, A.J., Penn, R.L., Banerjee, S.K., **Geiss, C.E.** & Zanner, C.W., 2006. Rock Magnetic, Chemical and Bacterial Community Analysis of a Modern Soil From Nebraska, *Earth Planet. Sci. Lett.*, 261, 168-178.
- Umbanhowar, C.E., Camill, P., **Geiss, C.E.** & Teed, B., 2006. Asymmetric vegetation responses to mid-Holocene aridity at the prairie-forest ecotone in south-central Minnesota, *Quat. Res.*, 66, 53-66.
- Geiss, C.E.**, Banerjee, S.K., Camill, P. & Umbanhowar, C.E., 2004. Sediment-magnetic Signature of Land-use and Drought as Recorded in Lake Sediment from South-Central Minnesota, U.S.A., *Quat. Res.*, 62, 117-125.
- Geiss, C.E.**, Zanner, C.W., Banerjee, S.K. & Minott, J., 2004. Signature of magnetic enhancement in a loessic soil in Nebraska, United States of America, *Earth Planet. Sci. Lett.*, 228, 355-367.
- Camill, P., Umbanhowar, C.E., Teed, R., **Geiss, C.E.**, Dvorak, L., Kenning, J., Limmer, J., Walkup, K. & Aldinger, J., 2003. Late-glacial and Holocene climatic effects on fire and vegetation dynamics at the prairie-forest ecotone in south-central Minnesota, *Journal of Ecology*, 91, 822-836.
- Geiss, C.E.** & Banerjee, S.K., 2003. A Holocene - Late Pleistocene Geomagnetic Inclination Record from Grandfather Lake, SW Alaska, *Geophys. J. Int.*, 153, 497-507.
- Geiss, C.E.**, Umbanhowar, C.E., Camill, P. & Banerjee, S.K., 2003. Sediment magnetic properties reveal Holocene climate change along the Minnesota prairie-forest ecotone, *J. Paleolimnol.*, 30, 151-166.
- Mooney, S.D., **Geiss, C.E.** & Smith, M.A., 2003. The use of Mineral Magnetic Parameters to Characterise Archaeological Ochres, *Journal of Archaeological Science*, 30, 511-523.
- Geiss, C.E.** & Banerjee, S.K., 1999. Comparison of two interglacial records from the midwestern U.S.A., *Phys. Chem. Earth*, 24, 793-798.
- Geiss, C.E.** & Banerjee, S.K., 1997. A multi-parameter rock magnetic record of the last glacial-interglacial paleoclimate from south-central Illinois, USA, *Earth Planet. Sci. Lett.*, 152, 203-216.
- Geiss, C.E.**, Heider, F. & Soffel, H.C., 1996. Magnetic domain observations on magnetite and titanomaghemite grains (0.5 - 10  $\mu\text{m}$ ), *Geophys. J. Int.*, 124, 75 - 88.

Heider, F., **Geiss, C.E.**, Dunlop, D.J. & Inokuchi, H., 1992. Rock magnetic investigation of basalts from the southern Kerguelen Plateau (Leg 120). in *Proceedings of the Ocean Drilling Program, Scientific Results*, pp. 79-87, eds. Wise Jr., S. W. & Schlich, R., College Station, TX.

### **Presentations at Conferences**

(underlined authors are Trinity undergraduate students)

#### **2015**

Camill, P., C. E. Umbanhowar, M. B. Edlund, and **C. E. Geiss** (2015), Peat initiation, soil carbon accumulation, fire, and vegetation changes in north-central Canadian arctic lowland forest peatlands during the Holocene Abstract B11H-0551 presented at 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec.

**Geiss, C. E.**, and L. E. Hasbargen (2015), Magnetic and Sedimentological Analyses of Sediment Cores from Otsego Lake Reveal Climate and Possible Delta Dynamics Throughout the Holocene Abstract GP51A-1317 presented at 2015 Fall Meeting, AGU, San Francisco, Calif., 14-18 Dec.

#### **2014**

**Geiss, C.E.**, Camill, P., Edlund, M.B., Umbanhowar Jr, C.E., 2014. Climatic and Local Drivers of Sediment-magnetic Properties for Sub-arctic Lakes. *Geological Society of America Abstracts with Programs* 46(6).

#### **2013**

**Geiss, C.E.**, 2013. Does Timing Matter? Temporal Stability of Soil-Magnetic Climate Proxies. Abstract GP51D-05, presented at 2013 Fall Meeting, AGU, San Francisco, Calif. 9-13 Dec.

Hasbargen, L.E., **Geiss, C.E.** & Kromhout, S., 2013. Flood stratigraphy at the margin of a delta front in a modern reservoir: Morris Pond, NY, *Geological Society of America Abstracts with Programs*, 45, 0.

Roman, S.A. & **Geiss, C.E.**, 2013. Grass fires - an unlikely process to explain the magnetic properties of prairie soils, *Geological Society of America Abstracts with Programs*, 45, 136.

#### **2012**

Camill, P., Hall, A., Westervelt, A., Adams, C., Umbanhowar, C.E., **Geiss, C.E.** & Edlund, M.B., 2012a. Disentangling the effects of climate and local ecosystem dynamics on carbon accumulation in boreal and low-Arctic peatlands in northern Manitoba, Canada, *presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.*, Abstract PP21E-02.

**Geiss, C.E.** & Hasbargen, L.E., 2012. Rock-magnetic Analyses of Lacustrine Near-shore Sediments to Reconstruct Storm Frequency in Upstate New York, U.S.A., *presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.*, Abstract GP41A-1096.

Hasbargen, L.E. & **Geiss, C.E.**, 2012. Muddy waters: Particle size distributions in a Holocene

lacustrine delta, *Geological Society of America Abstracts with Programs*, 44, 317.

Smith, J.L. & **Geiss, C.E.**, 2012. Mapping of Arctic peatlands using ground-penetrating radar and borehole data, *Geological Society of America Abstracts with Programs*, 44, 53.

Umbanhowar, C.E., Camill, P., Edlund, M., **Geiss, C.E.**, Kreger, D., Durham, W., Molano, W., Raskob, C., Stocker, M., Tvera, A. & Williams, J., 2012. Contrasting Changes for Surface Waters and Barrens Over the Past 60 Years for a Subarctic Forest-Tundra Region Located in Northern Manitoba Based on Comparison of Remote Sensing Imagery, *presented at 2012 Fall Meeting, AGU, San Francisco, Calif., 3-7 Dec.*, Abstract GC23B-1056.

## 2011

**Geiss, C.E.**, 2011. Effect of fire on the magnetic properties of loessic soils, *Geological Society of America Abstracts with Programs*, 43, 663.

**Geiss, C.E.**, Camill, P., Umbanhowar Jr, C.E. & Edlund, M.B., 2011. Rock-magnetic Records of Arctic Lake Sediments Reveal Complex Links Between Lakes and Environmental Change, Abstract PP31A-1852 presented at 2011 Fall Meeting, AGU, San Francisco, Calif., 1855-1859 Dec.

Payton, B.M., Johnson, W.C., Terwilliger, V. & **Geiss, C.E.**, 2011. Magnetic analysis of fluvial soils may aid in reconstruction of Ethiopian paleoclimates, *Geological Society of America Abstracts with Programs*, 43, 617.

## 2010

Camill, P., Umbanhowar, C.E., **Geiss, C.E.**, Teed, R.E., Dorale, J.A. & Lynch, J.A., 2010. Multiproxy, cross-biome analysis of ecosystem dynamics during late-glacial and Holocene climatic change In north-central North America, *Abstract B21A-0288 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.*

**Geiss, C.E.**, Oleskewicz, M., West, D. & Post, D.M., 2010. Magnetic properties of lake sediments as a possible tool to improve estimates of prehistoric fluctuations in fish population, *Abstract GP33-01 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.*

Lopez, G., Johnson, W.C. & **Geiss, C.E.**, 2010. The Effect of Prairie Fires on the Magnetic Properties of Modern Soils at Konza Prairie, Kansas, *Abstract GP13B-0783 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.*

Quinton, E.E., Dahms, D. & **Geiss, C.E.**, 2010. Magnetic Properties of a Fluvial Chronosequence From the Eastern Wind River Range, Wyoming, *Abstract GP13B-0782 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.*

Schultheiss, S., **Geiss, C.E.**, Camill, P., Edlund, M. & Umbanhowar Jr, C.E., 2010. Estimates of Arctic Wetland Extent Using Ground Penetrating Radar, *Abstract NS23A-1452, presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.*

Shinneman, A., Hobbs, W., Edlund, M., Umbanhowar, C.E., Camill, P. & **Geiss, C.E.**, 2010. Interpreting linkages among landscape, water chemistry, and diatom communities to better understand subarctic paleoenvironmental records, *Abstract GC43A-0944 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.*

Umbanhowar, C.E., Henneghan, P., Passow, K., Emmons, E., Kubis, M., Parker, M., Camill, P., **Geiss, C.E.** & Edlund, M., 2010. Distribution of carbon and cations across aquatic and terrestrial ecosystems of the western Hudson Bay low Arctic, Manitoba, Canada, *Abstract GC43A-0959 presented at 2010 Fall Meeting, AGU, San Francisco, Calif., 13-17 Dec.*

## 2009

**Geiss, C.E.**, 2009. Rock-magnetic record of two glacial lakes reflects history of glacial retreat and landscape stabilization in the eastern Wind River Range at the Pleistocene-Holocene transition, *Geological Society of America Abstracts with Programs*, 41, 48.

**Geiss, C.E.**, Urbano, L.D. & Munroe, C.M., 2009. Rates of Magnetic Enhancement in Loessic Soils Estimated From Profiles of Rapidly Eroding Soils, *Eos Trans. AGU Fall Meet. Suppl.*, 90, Abstract GP41C-07.

Iwachiw, I., Tucker, C.W., Gourley, J. & **Geiss, C.E.**, 2009. Prehistoric Mercury concentrations obtained from two Connecticut laes allow for reconstruction of past volcanic activity, *Geological Society of America Abstracts with Programs*, 41, 640.

Munroe, C.M., **Geiss, C.E.** & Urbano, L.D., 2009. Magnetic Enhancement of Loessic Soils Along a Toposequence at Badger Ridge-Hitchcock Nature Area, Iowa, U.S.A. , *Eos Trans. AGU, 90(52), Fall Meet. Suppl., Abstract GP43B-0855.*

Payton, B.M., Lopez, G., Doner, L., Fowler, B.K. & **Geiss, C.E.**, 2009. Sediment Magnetic Proxies Reflect Post-Glacial Climate Change for East-Central New Hampshire, *Eos Trans. AGU Fall Meet. Suppl.*, 90(52), Abstract GP43B-0856.

## Recent Invited Presentations

The Effects of Grassland Fires on the Magnetic Properties of Soils, 3/28/2014; Presentation given to geology faculty and students at Franklin and Marshall College, Lancaster PA

The Volcanic Rocks of Rockridge Park, 1/13/2014; Presentation and field trip given to a handful of students at Moylan Montessori School

The Effects of Grassland Fires on the Magnetic Properties of Soils, 11/15/2013; Presentation given to geology faculty and students at CCSU.

300 Million Years of Trinity History, 9/28/2013; Presentation given to Trinity alumni

The Fate of Arctic Carbon, 2/21/2013; Presentation given to high-school students at the Watkinson School.

Sub-arctic Wetlands and Climate Change, 2/10/2012, Presentation given to high-school students at Pomfret School.

## Recent Service to the College

2007 – present	Environmental Science Program Director
2009 – 2012	Member Educational Policy Committee
2012 – present	Member Athletic Advisory Committee
2013 – present	Member Faculty Communications Advisory Council
2013 - 2015	Faculty head of house for Trinity College house system, to be implemented in Fall 2015 and scrapped in Fall 2014
Spring 2013	Member of Subcommittee on Compliance and Support for Social Organizations
2011 – present	Faculty liaison for women’s tennis and ice-hockey teams
2010 – present	Faculty marshal
2014 – present	NCAA Faculty Athletics Representative

## Other Service

2016 – present	Guest editor Northeastern Naturalist
2015 – present	Subject editor for geophysics, FACETS Journal
2014 – present	Member Geological Society of Connecticut Academic Advisory Panel
2014	Governor's Council for Agricultural Development – Working group on producer education and innovation, member
11/2013	Hosted annual meeting of Geological Society of Connecticut
ongoing	Reviewer for numerous peer-reviewed journals (Aeolia, Boreas, Earth and Planetary Science Letters, Geophysical Journal International, Global and Planetary Change, Journal of Geophys. Research, Palaeogeography, Palaeoclimatology, Palaeoecology, Quaternary International, Quaternary Research, Soil Science Society of America Journal, Soil Science)
ongoing	Reviewer for numerous grant proposals to the National Science Foundation
ongoing	Convener of topical sessions on environmental magnetism at professional meetings (AGU and GSA), outstanding student award judge (AGU)
2004 – 2012	Town of Wethersfield Conservation Commission, member, chair

## Professional Memberships

1994 – present	American Geophysical Union (AGU), member
1994 – present	Geological Society of America (GSA), member
2002 – present	American Quaternary Association (AMQUA), member
2009 – present	Geological Society of Connecticut founding member

## **Honors, Awards and Grants**

2014 Bantam Award for distinguished contribution to Trinity Sports Program  
2013 Geophysical Journal International: Reviewer of the Year.  
2007 Dean Arthur H. Hughes Award for Achievement in Teaching

## **Recent Research Support**

2011 - 2012 National Science Foundation, MRI: Acquisition of an analytical scanning electron microscope for an interdisciplinary multi-user facility. (\$359,180)  
2010 - 2012 National Science Foundation, MRI R<sup>2</sup>: Acquisition of powder X-ray diffraction instrument for faculty research and undergraduate education (\$132,526)  
2009 - 2010 National Science Foundation, Acquisition of laboratory equipment to characterize sediments and soils for paleoenvironmental reconstructions (\$235,764)  
2008 - 2011 National Science Foundation, Collaborative Research: RUI: Landscape-level controls on terrestrial, aquatic, and wetland responses to climate change in the southern Canadian Arctic (\$83,108)  
2005 – Present Numerous research grants from Trinity College to support faculty research and undergraduate research assistants

## **Other Training**

Certified Wildland Firefighter FFT-2  
Wilderness First Aid

## **Languages**

fluent in German and English  
incomprehensible in Icelandic, Latin, and French