

Brian K. Hornbuckle

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Professional Preparation

- Sc.B. Brown University, Electrical Engineering (Systems), Magna Cum Laude with Honors in Engineering, 1994.
- M.A. The University of Mississippi, Secondary Education (Science), 1996.
- M.S.E. The University of Michigan, Electrical Engineering (Electromagnetics), 1997.
- Ph.D. The University of Michigan, Electrical Engineering and Atmospheric Science (Geoscience and Remote Sensing), 2003.

Appointments

- 2018 - Professor, Department of Agronomy, Department of Electrical and Computer Engineering (courtesy), Department of the Earth, Atmosphere, and Climate (courtesy), Iowa State University of Science and Technology.
- 2009 - 2018 Associate Professor, Iowa State University of Science and Technology.
- 2003 - 2009 Assistant Professor, Iowa State University of Science and Technology.
- 1996 - 2002 NSF and EPA STAR Graduate Research Fellow, The University of Michigan.
- 1994 - 1996 Chemistry and physics teacher, Clarksdale (Mississippi) High School.

Instruction (40% of Position Responsibility)

AGRON 1830 Basic Skills for Agronomists Fall, weekly 3-hour laboratory, 2016-present. Developing the skills that agronomists employ in their work with crops, soil, and the environment through activities involving tools and methodologies used by agronomists.

AGRON/MTEOR 2060 Introduction to Weather and Climate Fall, 3-hours-per-week lecture, 2004-present. Basic concepts in weather and climate, including atmospheric measurements, radiation, stability, precipitation, winds, fronts, forecasting, and severe weather. Applied topics include global warming, ozone depletion, world climates and weather safety.

AGRON/ENSCI/MTEOR 4050/5050 Soil-Plant-Animal-Atmosphere Physics Spring (odd years), 3-hours-per-week lecture, 2005-present. The movement of energy and mass among the soil, vegetation, and atmosphere. The heat and water budget of humans, other animals, plants, and plant communities. Relevance to weather and climate, the effect of climate change on organisms, and remote sensing.

AGRON/E E/MTEOR 5180 Microwave Remote Sensing Spring (even years), 3-hours-per-week lecture, 2006-present. Microwave remote sensing of Earth's surface and atmosphere using satellite-based or ground-based instruments. Specific examples include remote sensing of atmospheric temperature and water vapor, precipitation, ocean salinity, and soil moisture.

ENSCI 6980 Environmental Science Seminar Spring, 1-hour-every-other-week seminar and symposium, 2007-present. Reports and discussion of recent research and literature.

Scholarship (40% of Position Responsibility)

Cirone, R. and B. K. Hornbuckle, The Diurnal Variation of L-Band Polarization Index in the U.S. Corn Belt Is Related to Plant Water Stress, *Remote Sensing*, doi:10.3390/rs17020180, 2025.

Hornbuckle, B. K., A. Valai, A. L. McCombs, and E. A. Griffin, All Students Can Benefit from a Personal Response System Pedagogy that Encourages Active Engagement Yet Lowers Barriers to Implementation, *Journal of Science Education and Technology*, doi:10.1007/s10956-024-10163-3, 2024.

Hartman, T., R. Cirone, K. Togliatti, B. K. Hornbuckle, and A. VanLoocke, A Spatial and Temporal Evaluation of the SMAP Cropland b-parameter across the U.S. Corn Belt, *Remote Sensing of Environment*, doi:10.1016/j.rse.2023.113752, 2023.

Walker, V. A., V. Wallace, E. Yildirim, W. E. Eichinger, M. H. Cosh, and B. K. Hornbuckle, From Field Observations to Temporally Dynamic Soil Surface Roughness Retrievals in the U.S. Corn Belt, *Remote Sensing of Environment*, doi:10.1016/j.rse.2023.113458, 2023.

Jadidoleslam, N., B. K. Hornbuckle, W. Krajewski, R. Mantilla, and M. Cosh, Analyzing Effects of Crops on SMAP Satellite-Based Soil Moisture using a Rainfall-Runoff Model in the U.S. Corn Belt, *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, doi:10.1109/JSTARS.2021.3131133, 2022.

- NASA SMAP Science Team, 2017-present.
- NASA ECOSTRESS Science Team, 2022-present.

Service (20% of Position Responsibility)

- faculty senator, Department of Agronomy; chair, Faculty Development and Administrative Relations (FDAR) Council; co-chair, Faculty Senate Workgroup on Extension Scholarship
- Director of Graduate Education, Agricultural Meteorology
- chair, Department of Agronomy Governance Document Committee
- undergraduate academic advisor, Department of Agronomy (20 students per semester)
- undergraduate research mentor (60 students up to present)
- Senior Faculty Marshall, university commencement ceremonies

Affiliations

Past Students Erik D. Kabela (Savannah River National Laboratory), Cihan Erbas (Yeni Yüzyil University, Istanbul, Turkey), Tracy L. Rowlandson (ZedX-BASF), Eric S. Russell (Washington State University), Samantha L. Irvin Purdy (USDA ARS), Jason C. Patton (University of Wisconsin, Madison), Ben D. Carr (State of Washington Department of Ecology), Victoria A. Walker (USDA ARS), Kati E. Togliatti (University of Wisconsin, Madison), Richard Cirone (USDA ARS)

Current Students Kyle DeLong (Ph.D. 2026), Matt Kavanaugh (M.S. 2025),
Emma Safranek (M.S. 2025)