

# EARTH SCIENCES

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## Departmental Student Learning Outcomes

Earth Science graduates exhibit knowledge and understanding of the component of the Earth system specific to their discipline so that they are prepared to embark on their careers and work effectively to address complex issues.

Earth Science graduates can employ evidenced-based scientific reasoning to critically think about problems in the Earth sciences. Students will engage in observation, inquiry, analysis, and synthesis to expand their knowledge and understanding of the Earth system in the courses and/or in student research.

Earth Science graduates demonstrate skill in the use of tools and the application of technologies appropriate to their discipline. Students will be able to evaluate the scientific problem to determine the appropriate tool and/or technology necessary to solve the problem and then employ that tool and/or technology effectively.

Earth Science graduates can effectively communicate their knowledge and understanding in both oral and written formats to diverse audiences.

## Program Overviews & Workforce Projections

The Earth Sciences span the disciplines of climate, energy, environmental hazards, mineral and water resources, tectonics, and weather. The need for energy, environmental protection, and responsible land and water resource management is projected to spur demand for geoscientists in the future (Bureau of Labor Statistics 2020). Earth Sciences courses are rigorous and comprehensive utilizing the most current technology so that students not only develop but also apply knowledge of their discipline to solve complex problems. Our students engage in research of critical importance such as identifying key processes in the forecasting of snowfall or determining how fluids flow through fractured and porous rock units. Graduates from the Earth Sciences curriculum find satisfying careers in the atmospheric sciences, emergency management, and the environmental geo- and ocean sciences.

Our bachelor's degrees are designed to prepare students for the professional workforce or graduate education with qualifications and skills that will ensure success. The meteorology curriculum conforms to the American Meteorological Society's (AMS) guidelines for a B.S. in atmospheric science/meteorology, and the GS-1340 civil service requirements for government employment (e.g., National Weather Service, NOAA). The BS EEOS environmental geology option exceeds the academic requirements for professional licensure and prepares every student for success through extensive opportunities to apply their skills in the field. The BS EEOS program has ocean/bay access at the Chincoteague Bay Field Station (CBFS), where students have opportunities for hands-on, feet-wet experiences, on shore and onboard research vessels. Academic minors in areas where the workforce is strong or emerging, such as data science, emergency management, environmental policy, geospatial sciences, mathematics, broadcast communication, government and political affairs, and heliophysics and space weather, are encouraged but not required.

Millersville University is a senior partner of the CBFS, institutional member of the American Geophysical Union (AGU), American Geosciences Institute (AGI), American Meteorological Society (AMS), International Association of Emergency Managers (IAEM), National Weather Association (NWA), University Corporation for Atmospheric

Research (UCAR), and an educational partner of the Weather Risk Management Association (WRMA). The University is a participant in the National Weather Service (NWS) StormReady® program and the Mid-Atlantic Regional Association Coastal Observing System, and the AMS Student Chapter is a member of the Weather-Ready Nation (WRN). For more information, see [www.millersville.edu/esci](http://www.millersville.edu/esci) (<https://www.millersville.edu/esci/>)