The AMS Climate Studies Course with Supplemental Geographic Information Systems and Service Learning Content

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Abstract

The course, Weather and Climate (GEOG 3500), is taught each fall semester at Tennessee State University (TSU), an Historically Black College and University (HBCU) hosting a total enrollment of approximately 9,200 students. The course content is supplemented in part with instructional innovations discussed at the 2012 NSF-AMS Climate Studies Diversity Project Course Implementation Workshop. Among the primary objectives is to expose underrepresented students from many academic disciplines and backgrounds to climate science.

With community outreach being an HBCU tradition, official service learning course designation is added as a strategy to recruit students. The service learning component of the course is supported with funding from the State Farm Good Neighbor Service Learning Grant Program ($15,000.00), the U.S. Department of Housing and Urban Development (HUD) HBCU Grant Program ($10,000.00), and the Global Learning and Observations to Benefit the Environment (GLOBE) Teacher Workshop on Climate Grant Program ($3,380.00). Funds support students' in exposing predominantly African American and low-income high school students to climate science and geospatial technology. Funds also support GLOBE Certification for pre-service teachers enrolled in the GEOG 3500 course.

GEOG 3500: Major Course Requirements – Fall 2012

American Meteorological Society Climate Studies Investigations

Students will learn to interpret real-time weather data provided by the American Meteorological Society (AMS) Climate Studies Geosciences Diversity/National Dissemination Project (http://www.ametsoc.org/amsedu/login.cfm), and complete assigned readings from the Climate Studies textbook. Each week, students will answer assigned questions in the AMS Investigations Manual: Climate Studies and/or Textbook Chapter Questions. Completed assignments will be due each Tuesday.

Weekly Earth Gauge Reports

In support of the Earth Gauge program (http://www.earthgauge.net), each week students will submit reports containing environmental information related to weather and its potential environmental impacts upon the Nashville/middle Tennessee area. Your reports must be based upon weekly weather conditions observed at the TSU Weather Bug site (www.weatherbug.com) and/or the AMS Daily Weather Summaries or Weekly Weather/Climate News. Potential sources of articles include, but are not limited to academic journal, popular magazine, or newspaper articles, etc. Your reports must also include a screen capture of the Weather Bug site five-day forecast and a printout of the AMS Daily Weather Summary/Weekly Weather Climate News information you used. The best reports will be forwarded to the local television meteorologists using the Earth Gauge service.

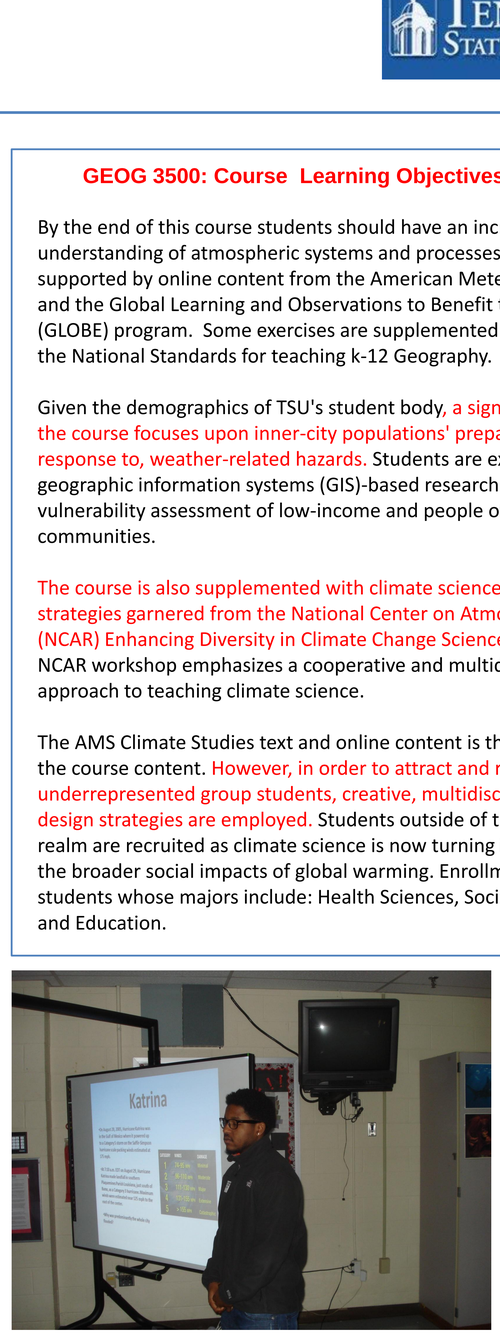
GEOG 3500: Course Learning Objectives – Fall 2012

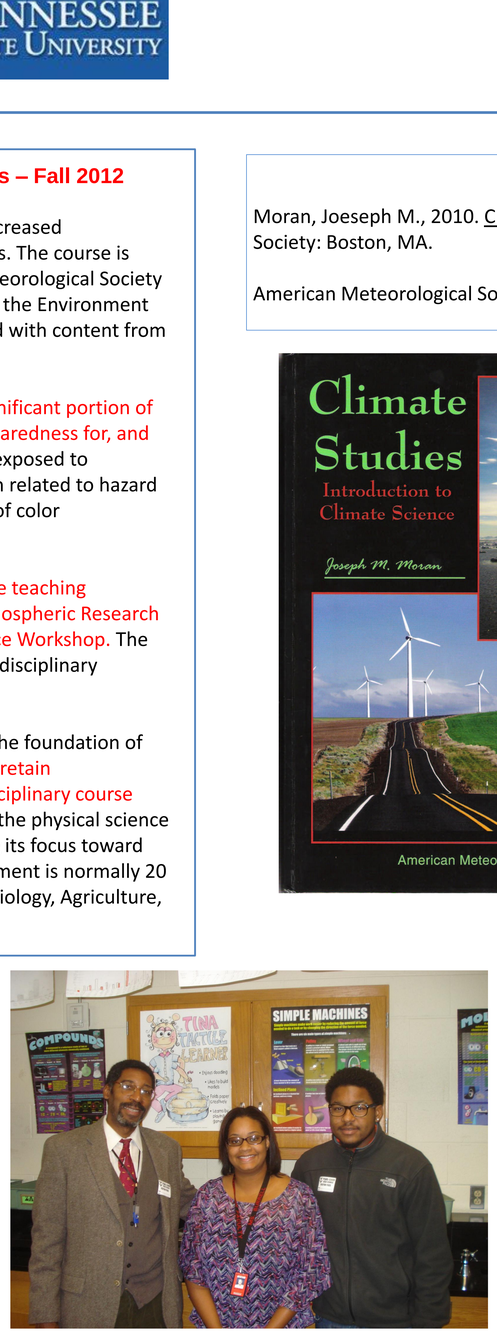
By the end of this course students should have an increased understanding of atmospheric systems and processes. The course is supported by online content from the American Meteorological Society and the Global Learning and Observations to Benefit the Environment (GLOBE) program. Some exercises are supplemented with content from the National Standards for teaching k-12 Geography.

Given the demographics of TSU's student body, a significant portion of the course focuses upon inner-city populations' preparedness for, and response to, weather-related hazards. Students are exposed to geographic information systems (GIS)-based research related to hazard vulnerability assessment of low-income and people of color communities.

The course is also supplemented with climate science teaching strategies garnered from the National Center on Atmospheric Research (NCAR) Enhancing Diversity in Climate Change Science Workshop. The NCAR workshop emphasizes a cooperative and multidisciplinary approach to teaching climate science.

The AMS Climate Studies text and online content is the foundation of the course content. However, in order to attract and retain underrepresented group students, creative, multidisciplinary course design strategies are employed. Students outside of the physical science realm are recruited as climate science is now turning its focus toward the broader social impacts of global warming. Enrollment is normally 20 students whose majors include: Health Sciences, Sociology, Agriculture, and Education.





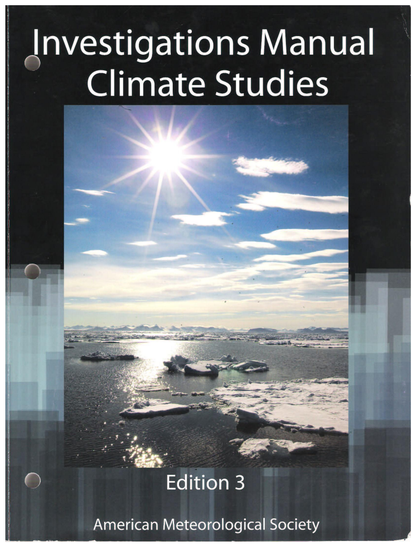
GEOG 3500: Service Learning Outreach Project – Fall 2012

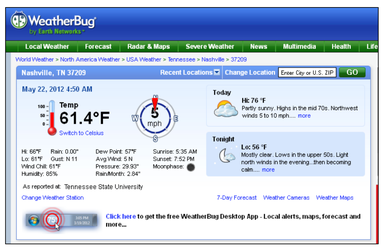
Tennessee State University Weather & Climate (GEOG 3500) students developed, and then presented, detailed lessons on extreme weather hazards and the unique properties of water to Ms. Burrell's Physical Sciences class at Pearl-Cohn High School. Students were required to write a 1000+ word "Outreach Project Expectations Essay" as they co-operatively created the lessons, and then were required to write an expository "Outreach Project Reflection Essay," after completing the project.

Required Texts and Materials

Moran, Joeseph M., 2010. Climate Studies: Introduction to Climate Science, American Meteorological Society: Boston, MA.

American Meteorological Society. 2012. *Investigations Manual: Climate Studies*, (Edition 3), Boston, MA.





GEOG 3500: Future Plans for Spring/Summer/Fall 2013

1. Spring 2013 - Geographic Information Sciences Laboratory student research assistants will assist in the installation of a WeatherBug Weather Station at Stratford STEM Magnet High School.

2. "May-Mester" 2013 – The Weather & Climate course will be offered during the three week May-Mester session.

3. Fall 2013 – Students enrolled in the Weather & Climate course will be engaged in the development of the TSU-Stratford STEM Magnet High School GLOBE Partnership. The high school is over 90 percent African American with the majority of the students receiving free and reduced price meals. The weather station offers the students the opportunity to collect and observe real-time local weather data.