

A satellite image of Earth showing swirling white clouds over a dark blue ocean and green landmasses. The text is overlaid on this image.

# **Exposing Students to Climate Science via HBCU Service Learning Outreach**

**David A. Padgett  
Associate Professor of Geography  
Director, Geographic Information Sciences Laboratory  
Tennessee State University  
Nashville, Tennessee**

**American Meteorological Society  
23<sup>rd</sup> Symposium on Education  
February 4, 2014  
Atlanta, Georgia**

# Weather and Climate (GEOG 3500) – AMS Weather Studies Curriculum

- taught each **fall** at Tennessee State University (TSU), a Historically Black College and University (HBCU) located in Nashville, Tennessee (8,800 students)
- AMS Education Program staff provides real-time content and lessons covering North America's hurricane season, fall tornado season, and other phenomena.
- GEOG 3500 is a TSU Designated Service Learning Course

## WEATHER & CLIMATE

(GEOG 3500) 3 Credit Hours  
**FALL SEMESTER - 2013**  
Tue/Thu 9:40-11:05 am



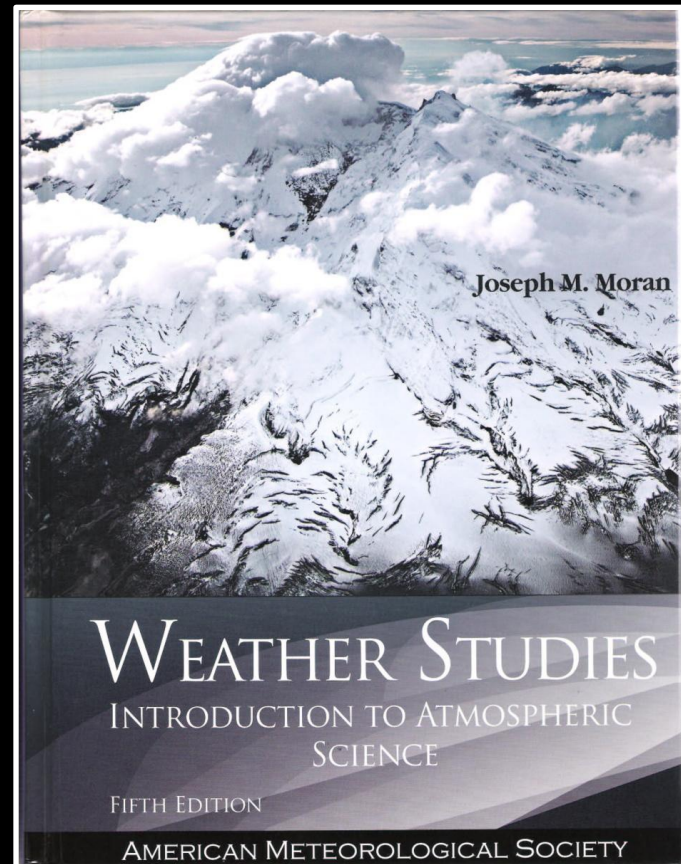
HURRICANE KATRINA – AUGUST 29, 2005 – LANDFALL WEATHER RADAR

Instructor: David A. Padgett  
Office: 213 Crouch Hall (Graduate Building)  
Phone: 963-5508 or 963-5471  
Email: [dpadgett@tnstate.edu](mailto:dpadgett@tnstate.edu)

### COURSE DESCRIPTION

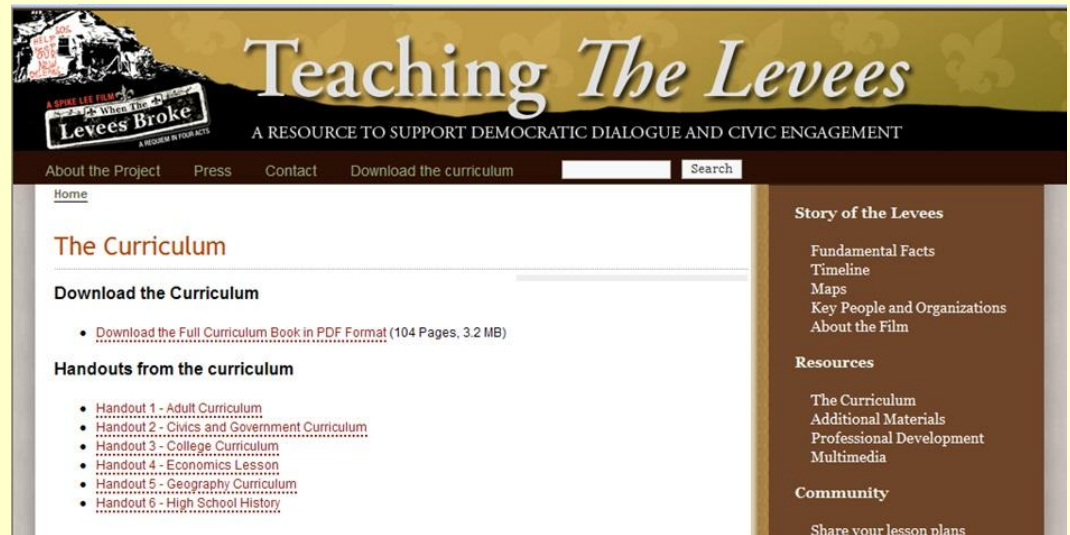
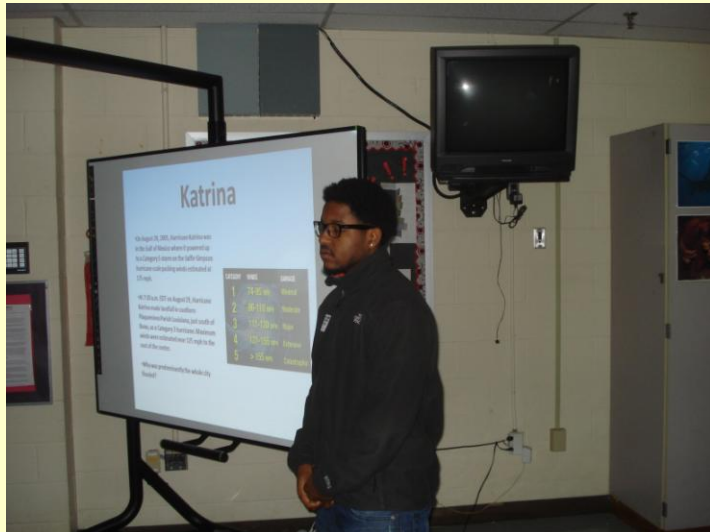
The properties, behavior, and importance of the atmosphere. Emphasis is given to observation and analysis of clouds and storm systems—cyclones, tornadoes, and hurricanes—the causes and global distribution of climate types, and major atmospheric concerns, including the greenhouse effect, acid rain, the ozone hole, and climatic change.

The course is supported by online content from the American Meteorological Society Climate Studies Diversity Project (<http://amsedu.ametsoc.org/amsedu/online/info/diversity.html>), the Global Learning and Observations to Benefit the Environment (GLOBE) program ([www.globe.gov](http://www.globe.gov)), and the WeatherBug Achieve program (<http://achieve.weatherbug.com/>)





Undergraduate TSU students enrolled in the fall Weather & Climate (GEOG 3500) course are required to develop and teach learning modules for Pearl-Cohn High School students on the dynamic impacts of hurricanes and applications of geographic information systems (GIS) in extreme weather disaster response and preparedness. Pearl-Cohn's enrollment is 93% African American with 93% of students qualifying for the free and reduced price lunch program.



The *Teaching the Levees* Curriculum – based upon Spike Lee's documentary "When the Levees Broke"



Free Geospatial Technology learning modules for high school students - James Madison University

# Mapping Nashville's **Red Cross** Emergency Shelters with Geospatial Technology: A **Pearl-Cohn High School** and TSU Community Engagement Partnership 2008-2009



**American  
Red Cross**



[www.lanceradvanced.com](http://www.lanceradvanced.com)

**Pearl Cohn High School**



TSU Pilot Center for Academic  
Excellence in Intelligence Studies



TSU Geographic Information  
Sciences Laboratory

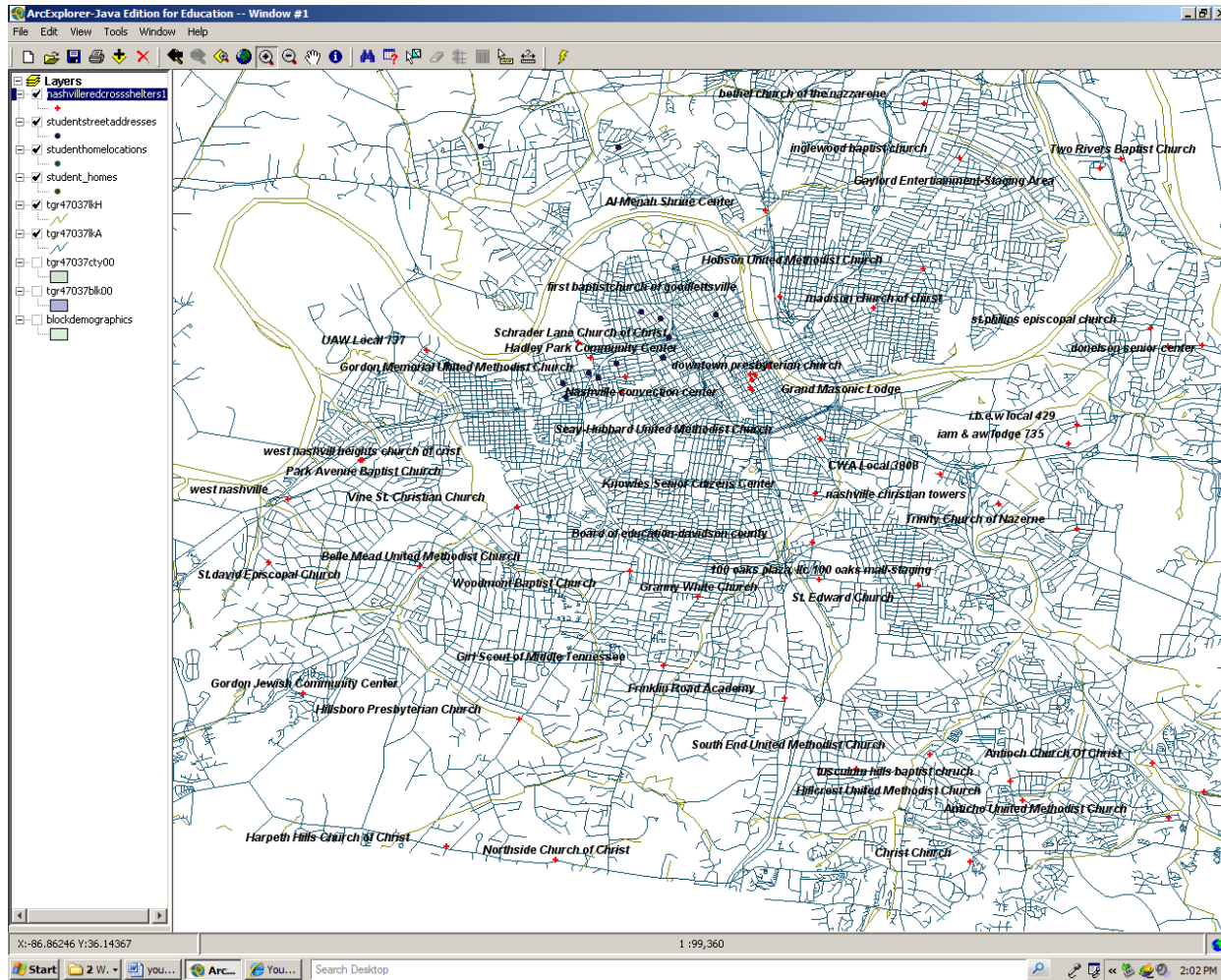


**Academic year 2008-2009:** TSU **Weather & Climate (GEOG 3500)** students worked with Pearl-Cohn High School students to produce emergency shelter maps for the Nashville Red Cross Chapter.



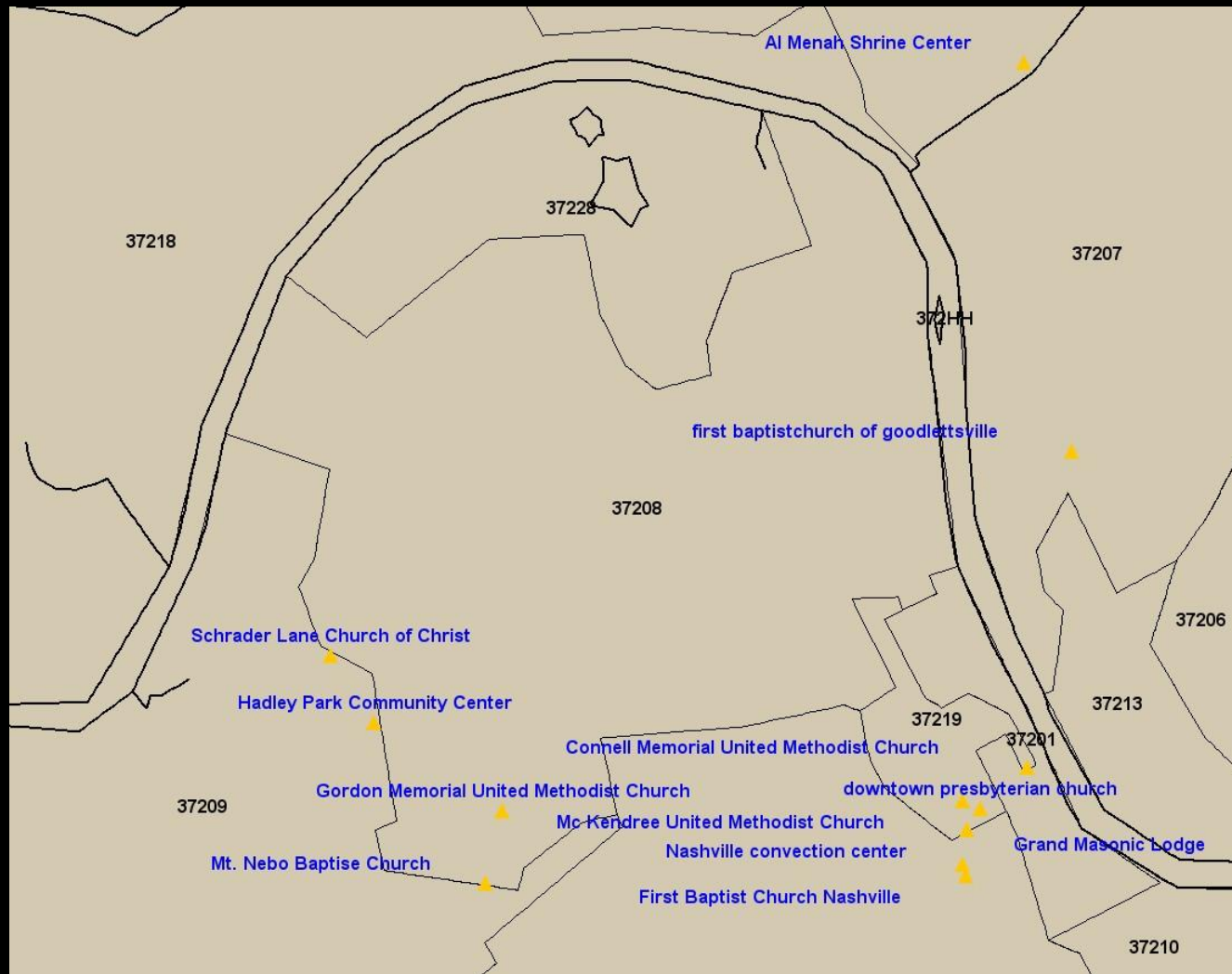
# Project Outcomes

**May 2009** - The Pearl-Cohn High School students produced the first maps of the locations of Nashville's **Red Cross** Emergency Shelters. Prior to this project, no such maps existed.



**May 2009 – The TSU/Pearl-Cohn High School Red Cross Emergency Shelters mapping project reveals that Nashville's lowest income zip code area (37208) is underserved in terms of emergency shelter availability.**

**Pearl-Cohn is located within the 37208 zip code area.**





**June 2009** - For producing the first maps of emergency shelters for the Nashville Chapter of the **American Red Cross**, each Pearl-Cohn High School student and their teacher, Mrs. Debbie Hirsch, was presented a volunteer award certificate

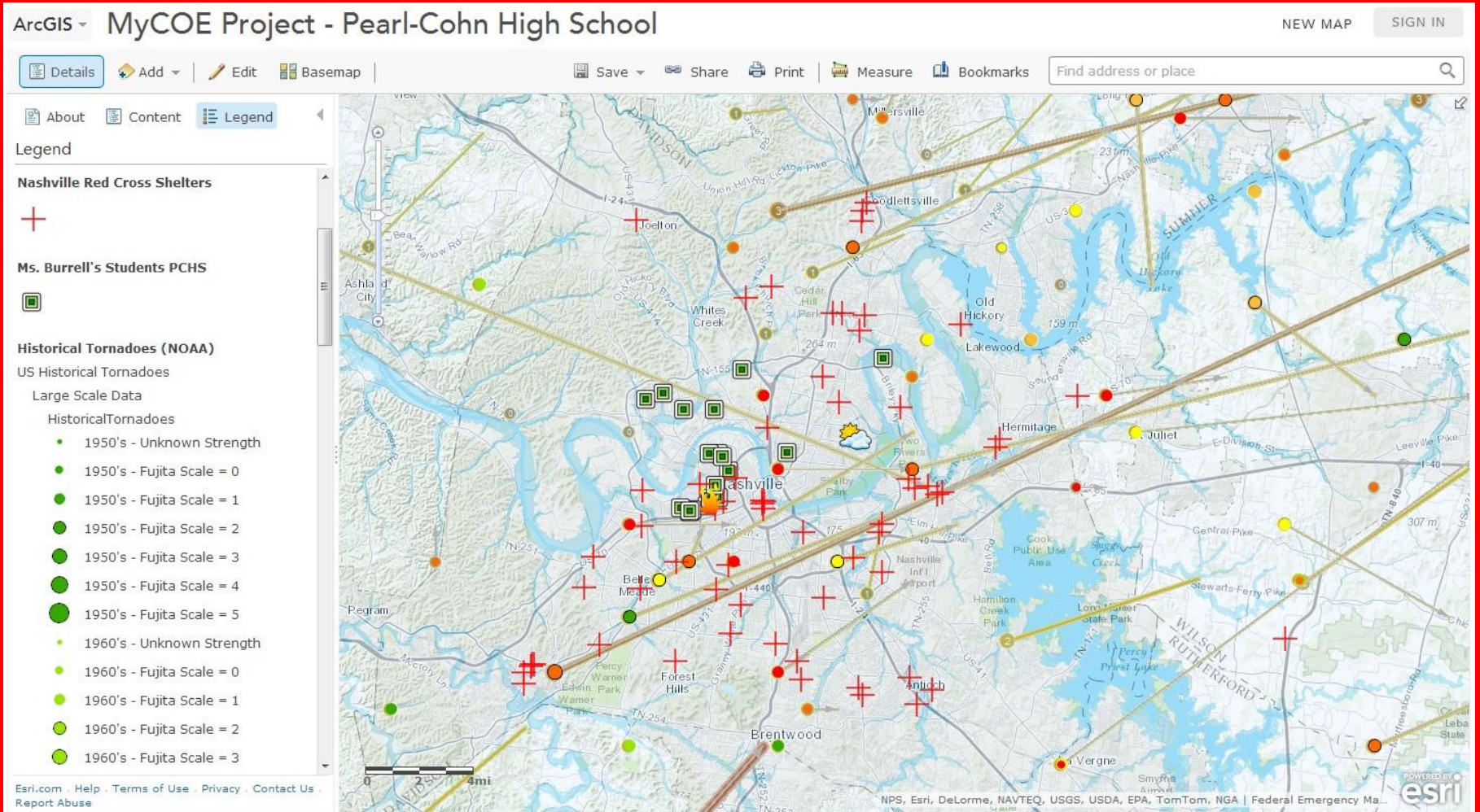


# May 2010 - Nashville, Tennessee : 500-1000 Year Flood Event

- Worst flooding in 140 years
  - 500-1000 year flooding
  - 17 inches of rain in 2 days
- Cumberland River crested at 52 feet
  - 12 ft above the flood stage
- Release of water by the Army Corps of Engineers
  - Protect critical structures
  - Potentially increased flooding
- \$2 Billion in damages
- Approximately two dozen fatalities
- More than 10,000 people displaced



The predominantly African American and low-income population in and near the 37208 zip code area was significantly impacted by the 2010 flood, in part due to lack of emergency shelters.



**Fall 2012** – Weather & Climate course students worked with Ms. Yolanda Burrell's Pearl-Cohn High School Physical Sciences class to produce a My Community, Our Earth ([www.mycoe.org](http://www.mycoe.org)) "Investigating Hazards Activity" online mapping project based upon emergency preparedness for extreme weather hazards.



# Weather and Climate (GEOG 3500) – AMS Climate Studies Curriculum

- taught each **summer** at Tennessee State University (TSU), a Historically Black College and University (HBCU) located in Nashville, Tennessee (8,800 students)
- AMS Education Program staff provides content and lessons covering topics such as climate change, climate region classification, El Nino/La Nina, etc.
- GEOG 3500 is a TSU Designated Service Learning Course

## WEATHER & CLIMATE

(GEOG 3500) 3 Credit Hours  
MAYMESTER 2013 (May 13 – June 3)  
MTWR, 12:30–4:00 pm



Instructor: David A. Padgett  
Office: 213 Crouch Hall (Graduate Building)  
Phone: 963-5508 or 963-5471  
Email: [dpadgett@tnstate.edu](mailto:dpadgett@tnstate.edu)

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## Climate Studies

Introduction to  
Climate Science

*Joseph M. Moran*



American Meteorological Society

Undergraduate TSU students enrolled in the summer Weather & Climate (GEOG 3500) course are required to develop and teach learning modules for Stratford STEM Magnet High School students based upon the Global Learning and Observations to Benefit the Environment (GLOBE) Atmosphere Protocol. The lesson must be supplemented with geospatial technology applications and data from the school's WeatherBug station. **Stratford's enrollment is 68% African American, 6% Hispanic with 91% of students qualifying for free and reduced price lunch.**



THE GLOBE PROGRAM

Home About GLOBE Explore Science What's New? Classic GLOBE

21 and 22 May: Online GLOBE [Webinar](#) - latest news about the Student Climate Research Campaign

16 - 20 July: 16th GLOBE Annual Partner Meeting - [Register now](#)

Partners - Nominate your students for the [Student Science Symposium](#)

THE GLOBE SCIENCE NETWORK

Regions

North America Latin America/Caribbean Europe/Eurasia Near East/North Africa Africa Asia/Pacific

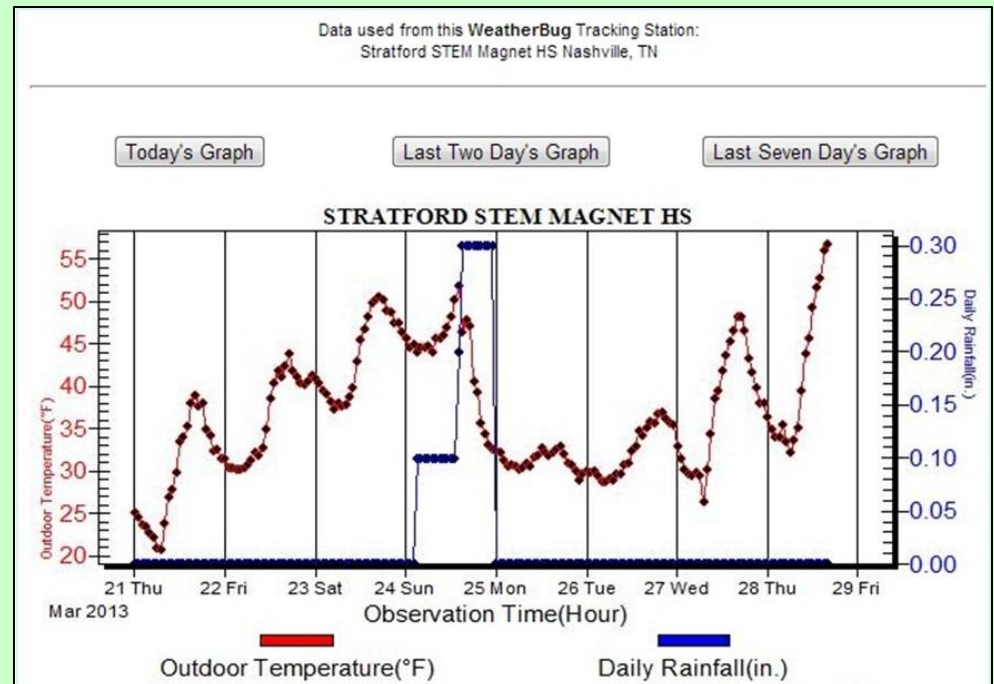
View all GLOBE Countries

Student Climate Research Campaign

GLOBE STARS

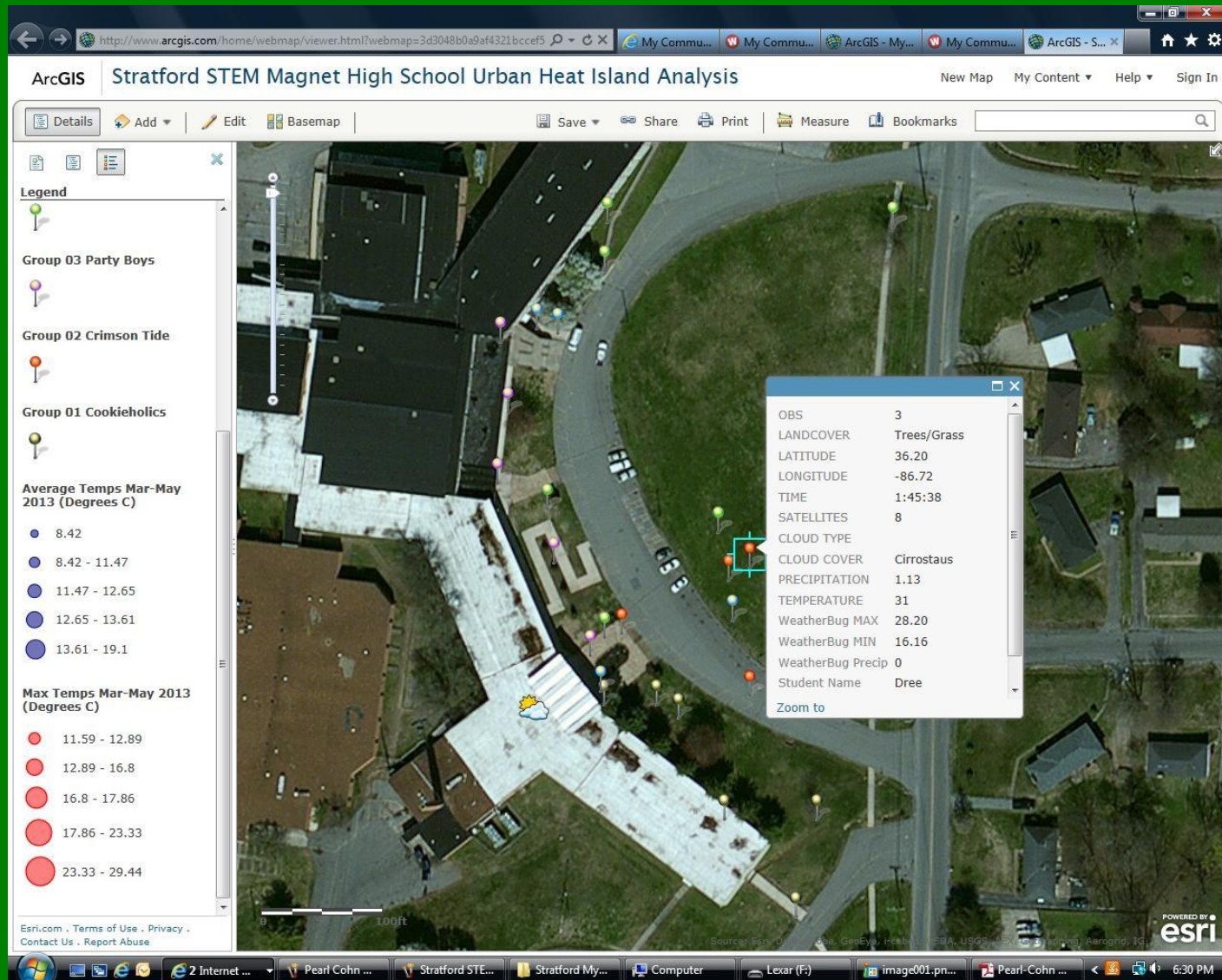
RECENT TWEETS

GLOBE is represented at International Symposium on Urban Lakes Monitoring and Management in Sri Lanka <http://www.sylm2013.org/>





Summer 2013 – Weather & Climate students worked with Stratford students enrolled in Ms. Allison McVey's AP Geography course on a My Community, Our Earth ([www.mycoe.org](http://www.mycoe.org)) online mapping project entitled "Urban Heat Islands Analysis".



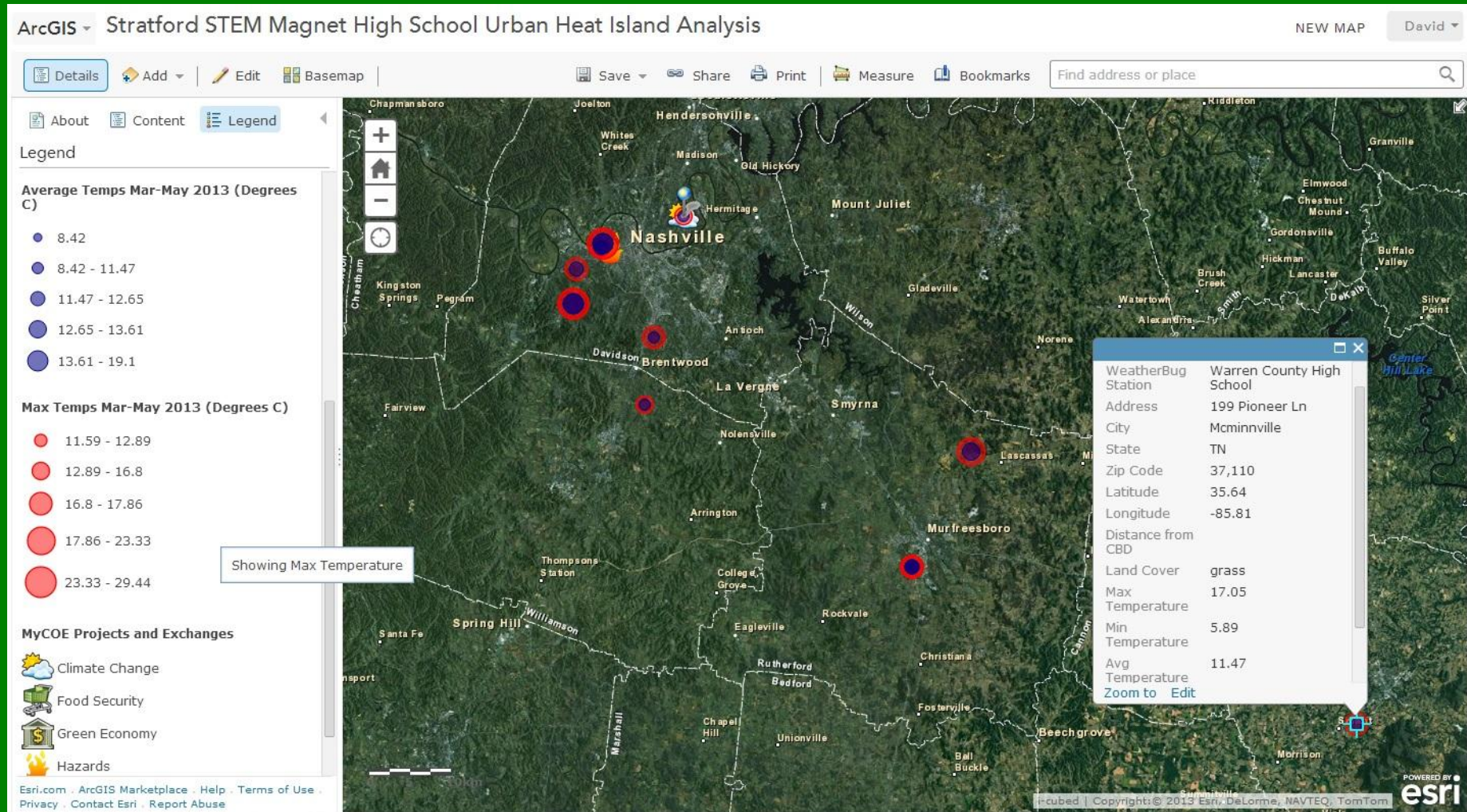


Precipitation, temperature, and cloud cover data were collected per the GLOBE Atmosphere Protocol. GPS receivers were used to record data collection point locations on Stratford's campus. Infrared thermometer data will also be collected from various land surfaces during summer 2014 course.





Maximum and Average Daily Temperature data recorded by the Stratford High School WeatherBug Station and other regional stations were downloaded and analyzed with regard to effect of land cover upon observed temperatures.



**THANK YOU!**  
**For your time and attention.**



**Dr. David A. Padgett, Associate Professor of Geography**  
**Director, Geographic Information Sciences Laboratory**  
**Tennessee State University, Nashville, Tennessee**  
**615.963.5508    [dpadgett@tnstate.edu](mailto:dpadgett@tnstate.edu)**