

Using Causes of Weather Deaths in Weather Safety Education and Preparedness



William P. Roeder¹ Kimberly H. Chafin² William A. Ulrich¹

HaeJean Kwun² Henry C. Okonkwo²

¹45th Weather Squadron
Cape Canaveral Air Force Station, FL

²Lake Nona High School
Orlando, FL

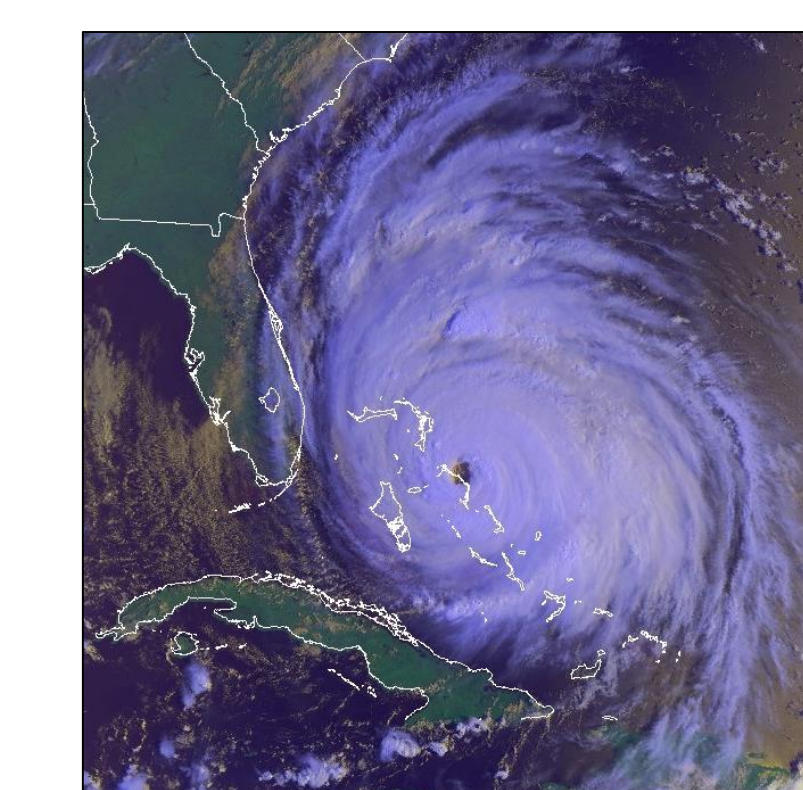
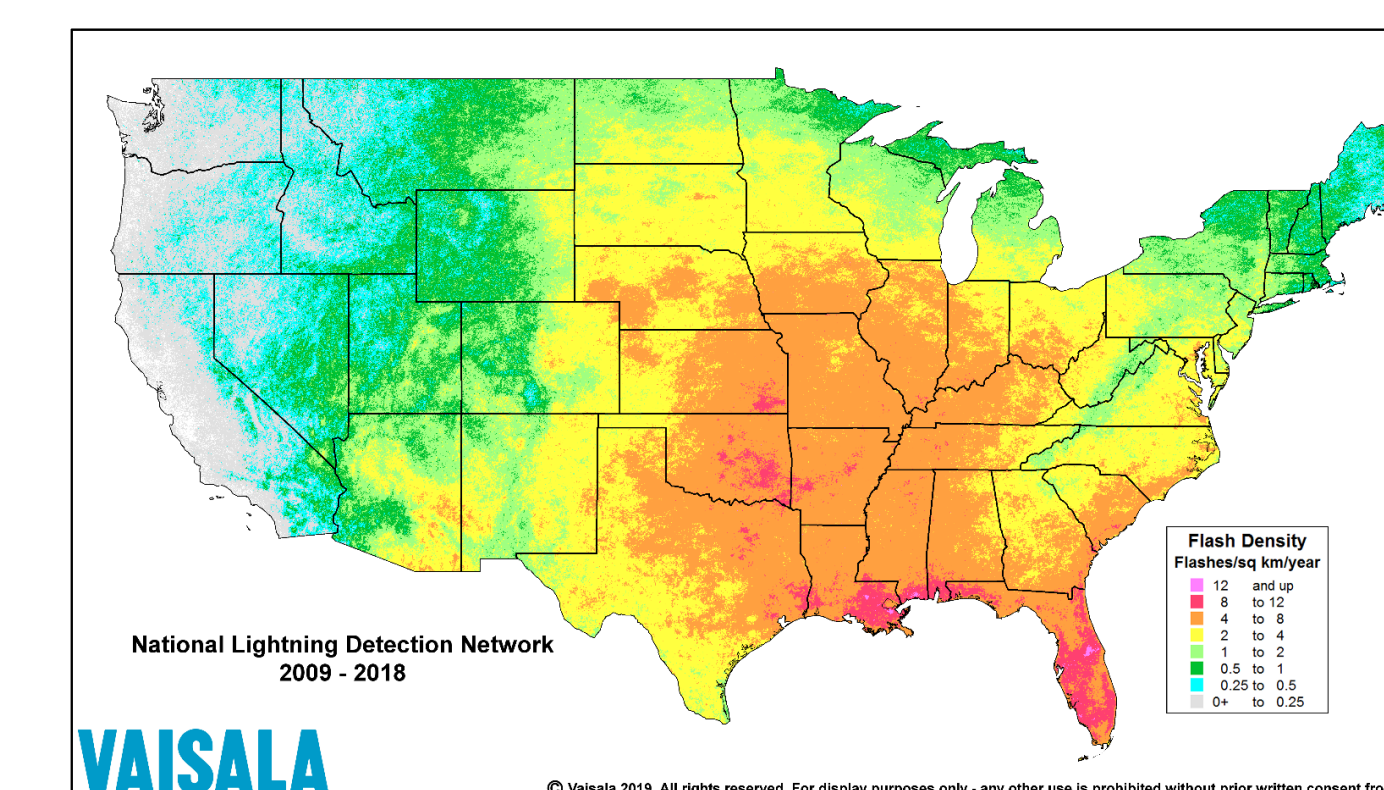
High school students improving U.S. hurricane preparedness!

COLLABORATIVE RESEARCH

- Lake Nona High School, Orlando, FL
 - AP Calculus and AP Statistics classes
- 45th Weather Squadron (45 WS), Cape Canaveral Air Force Station, FL
 - Provides weather support to space program at Cape Canaveral Air Force Station, NASA Kennedy Space Center, and Patrick Air Force Base, FL
- 5th Year in-progress (2019-2020)
 - 4 years completed (2015-2019)
- Lake Nona High School students motivated to pursue Science, Technology, Engineering, and Math (STEM)
- 45 WS gets operational research
- Business Paradigm
 - 45 WS specifies requirements
 - Students decide how to meet requirements
 - In addition to STEM, students also learn:
 - Leadership
 - Management
 - Followership
 - Teamwork
 - Planning
 - Scheduling
 - Speaking & Presentation Skills
- Done on volunteer basis
 - No \$-cost to either organization

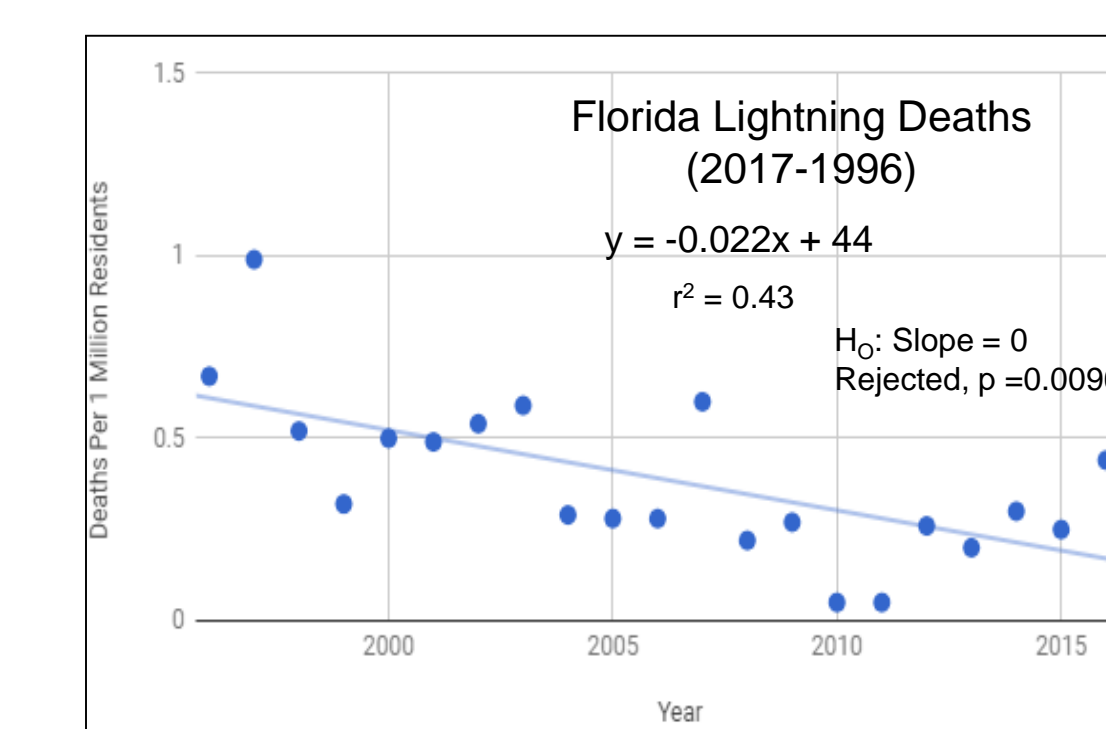
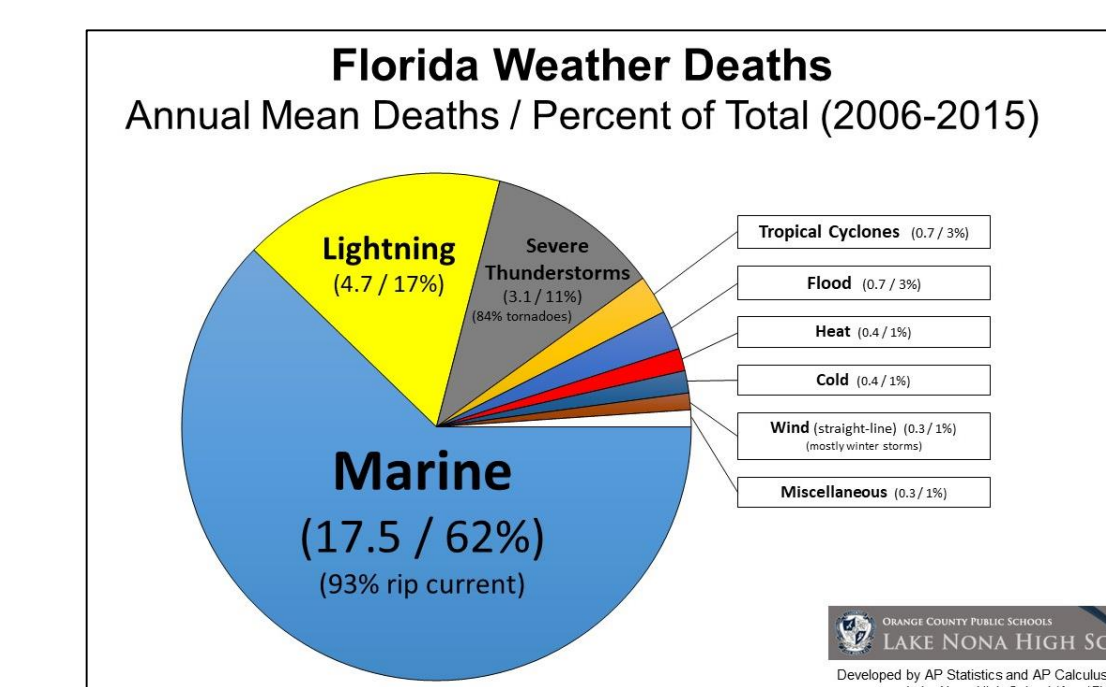
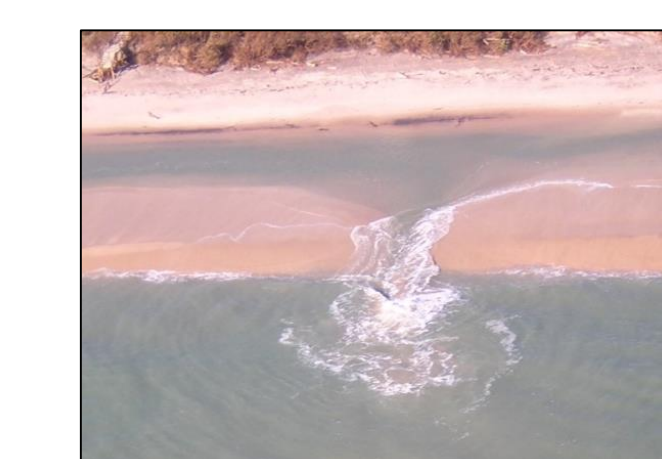
2 MAIN PROJECTS:

- 1) Florida Weather Deaths
- 2) CONUS Tropical Cyclone Deaths



1) Florida Weather Deaths: (Year-4)

- Distribution of weather deaths over past 10 & 30 years
- Lightning deaths since 1998
 - Intensive lightning safety education began in Florida in 1998
 - Annual rate of lightning deaths down 53%
 - Per capita lightning deaths down 81%
 - Only statistically significant trend of all weather deaths
 - **Weather safety education works!**
- Updating results to include 2018



2) CONUS Tropical Cyclone (TC) Deaths: (New!)

- Updated weather causes of CONUS TC Deaths (2006-2018)
- Storm Surge surged from 1% to 49% of deaths
 - Likely due to 2-3 extreme events, especially Hurricane Katrina (2005)
- Storm Surge reverted back to small contributor
- Rain returned as a larger contributor than before
- **Opportunity to improve U.S. hurricane preparedness!**
- On-going Work: Add 2019. Resampling for error bars & hypothesis testing. Analyzing Puerto Rico separately.

