



## Student Scholarship Internship Opportunity (SSIO) Online System

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### SSIO 2022 Internship Opportunity Position

#### Internship Information

**Project title:** Using Wet Bulb Globe Temperature to assess heat impacts across North Carolina

**NOAA mission goal:** Weather-Ready Nation

**Hypothesis or objectives:** Wet bulb globe temperature (WBGT) is a measure of heat stress which takes into account sunshine (solar insolation), wind, humidity, and temperature. It is considered a more comprehensive metric than the heat index or apparent temperature, which only considers temperature and humidity. As a result, WBGT is gaining favor as a more thorough and representative measure of heat stress, which is becoming increasingly important given that heat dangers are projected to increase worldwide due to climate change.

In this project, the scholar will create a climatology of WBGT in North Carolina, using the ECONET network developed by the State Climate Office. These WBGT values will be compared to heat-related emergency department visit data provided by the North Carolina Department of Health and Human Services to determine if there is a correlation between high WBGT values and large numbers of heat-related illnesses. This WBGT data will also be compared to traditional heat index values to see if the WBGT presents a more robust measure of extreme heat threat to public health. Issuances of NWS heat advisories and excessive heat watches and warnings will also be examined and compared to calculated WBGT values.

The results of this project may be used to help refine National Weather Service extreme heat alerts; target these alerts for specific vulnerable populations and communities that are most at risk; and provide critical standards and thresholds for WBGT values as measures of health impact.

**Academic status:** Graduate

**Estimated start - end date:** June 2022 - August 2022

**Duration:** 3 months

**Area(s) of discipline:** Atmospheric Science, Communication, Earth Science, Environmental Science Studies, Geography, Meteorology, Physical Sciences

**Internship location:** Raleigh, NC

**Duties and responsibilities:** The scholar will be provided with training on NWS forecasting and warning operations, and will have opportunities to shadow NWS meteorologists preparing forecasts and materials during periods of excessive heat. They will learn how heat index and WBGT are derived, how they are forecast, and how they are used to aid decision makers. In addition, there will also be opportunities to observe and participate in operations during active or severe weather. They will also become familiar with daily operations at the State Climate Office and learn more about the constituents that they serve.

The student will then be introduced to a historical database of observations from the North Carolina Environment & Climate Observing NETWORK (ECONET), as well historical mortality/morbidity data from the North Carolina Dept of Health and Human Services (DHHS). Data will be extracted from both databases to see what correlations exist. Finally, the scholar will look back at any NWS Excessive Heat Warning or Heat Advisories that may have been in effect at the time.

**Special skills/training required:** General familiarity with accessing historical observational data. Familiarity with EXCEL or similar software is preferred but not necessary. Training will be provided for the use of NWS AWIPS software and other software applications used to analyze and forecast excessive heat. Additional or supplemental meteorological training will be provided as needed.

**Expected outcomes:** The scholar will determine the link between calculated WBGT and mortality/morbidity data, and determine the extent to which correlations exist. For completeness, correlations between heat index and mortality/morbidity data will also be examined. The findings of this project will be used as part of a broader messaging strategy to ensure core partners are being notified at the appropriate thresholds, and that vulnerable populations are receiving actionable information in a timely manner. The student will also gain a better understanding of NWS forecast operations and considerations that go into the Watch/Warning process, as well as how information is communicated to key stakeholders.

**Guidance and supervision:** Guidance and supervision will be provided by the Science and Operations Officer. The student will also interact with, and receive guidance from the North Carolina State Climate Office Staff as well as several National Weather Service meteorologists.

**Application package:** Letter of recommendation/or names of references  
Resume  
Unofficial transcript  
Cover letter

**Posted or modified date/time:** Monday, September 27, 2021 - 5:11:00 PM

#### Internship Travel Information

**Purpose (student's role):** ---

**Mode of transportation:** ---

**Date(s):** ---

**Destination:** ---

**Estimated cost:** ---

**Source of funding:** ---

#### Mentors Contact Information

**Name:** Daniel Leins

**Organization:** National Weather Service (NWS)

**Program office:** Raleigh, NC

**Mailing address:** 1005 Capability Dr, Suite 300  
Raleigh, NC 27606

**Fax number:** None

**Phone number:** 919-326-1042 x224

**Email:** daniel.leins@noaa.gov

**Co-Mentor name:** ---

**Co-Mentor email:** ---

**Agency or organization:** ---



### Admin Action

Submitted internship:  **Approve**  
 **Disapprove**

Additional comment(s):  
(300 characters max)

Accepted for a minimum 3-month EPP NERTO internship. Requires: a workplan developed by CSC and NOAA mentor; substantial engagement with NOAA mentor; and, NOAA-aligned professional development. Queries are sent to: oed.epp10@noaa.gov.

Admin Initials (required):

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