

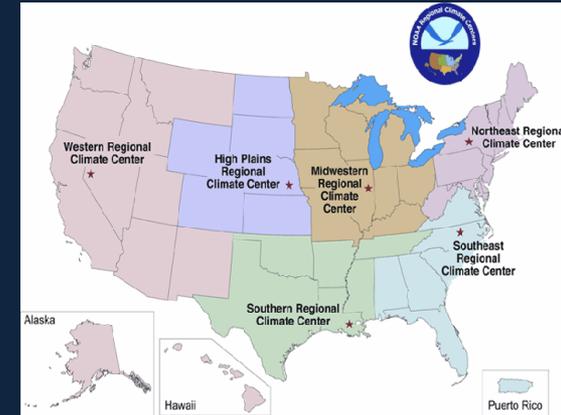
**Climate – Public Health Research
Engagement and Tool Development**

**Carolinas RISA (CISA)
The Southeast Regional Climate Center (SERCC)**

**Charles E. Konrad
Department of Geography
University of North Carolina at Chapel Hill**

**2015 RISA Meeting, Charleston, SC
January 14, 2015**

The Regional Climate Center (RCC) Program



- Interaction and engagement with climate stakeholders
- Distribution of climate data, data-products, and information
- Development web-based decision support tools
- **Education of stakeholders** on emerging regional climate issues
- Work with numerous entities, especially National Climate Data Center (NCDC) & state climatologists

Heat Illness Project

SERCC

CISA

National
Weather
Service

UNC Climate Change – Public Health Work Group

NC State Climate Office

UNC Gillings School of Public health

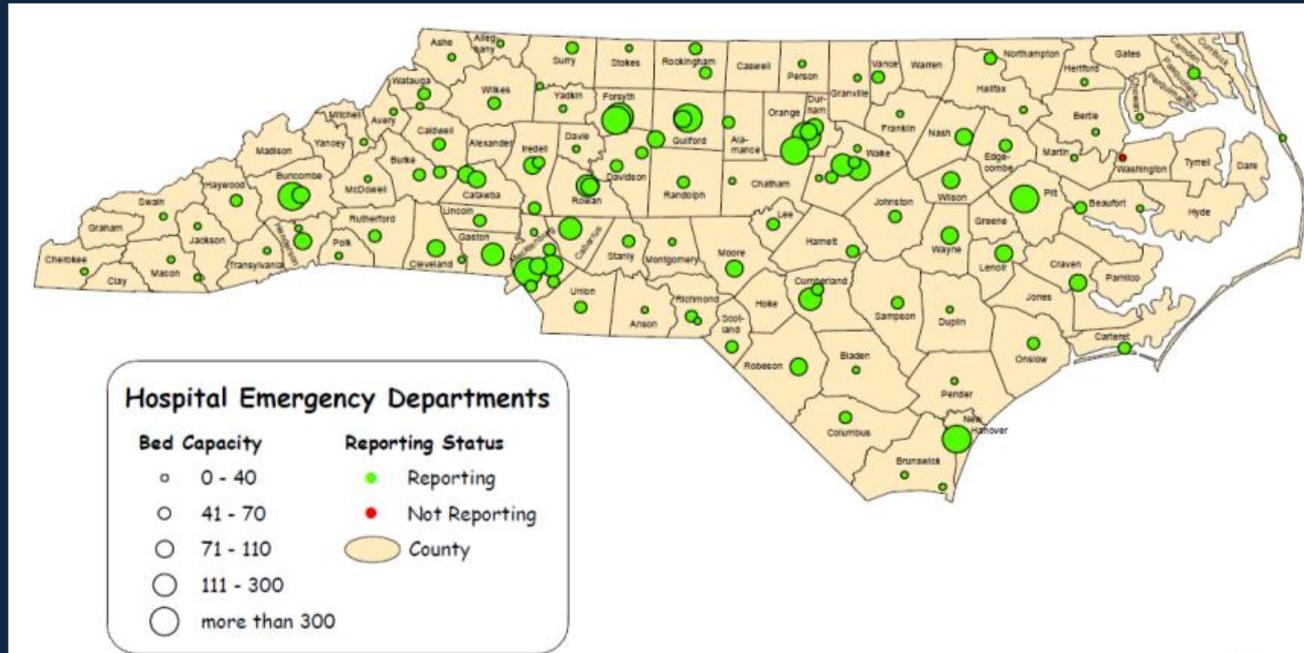
CDC BRACE program

NC Division of Public Health

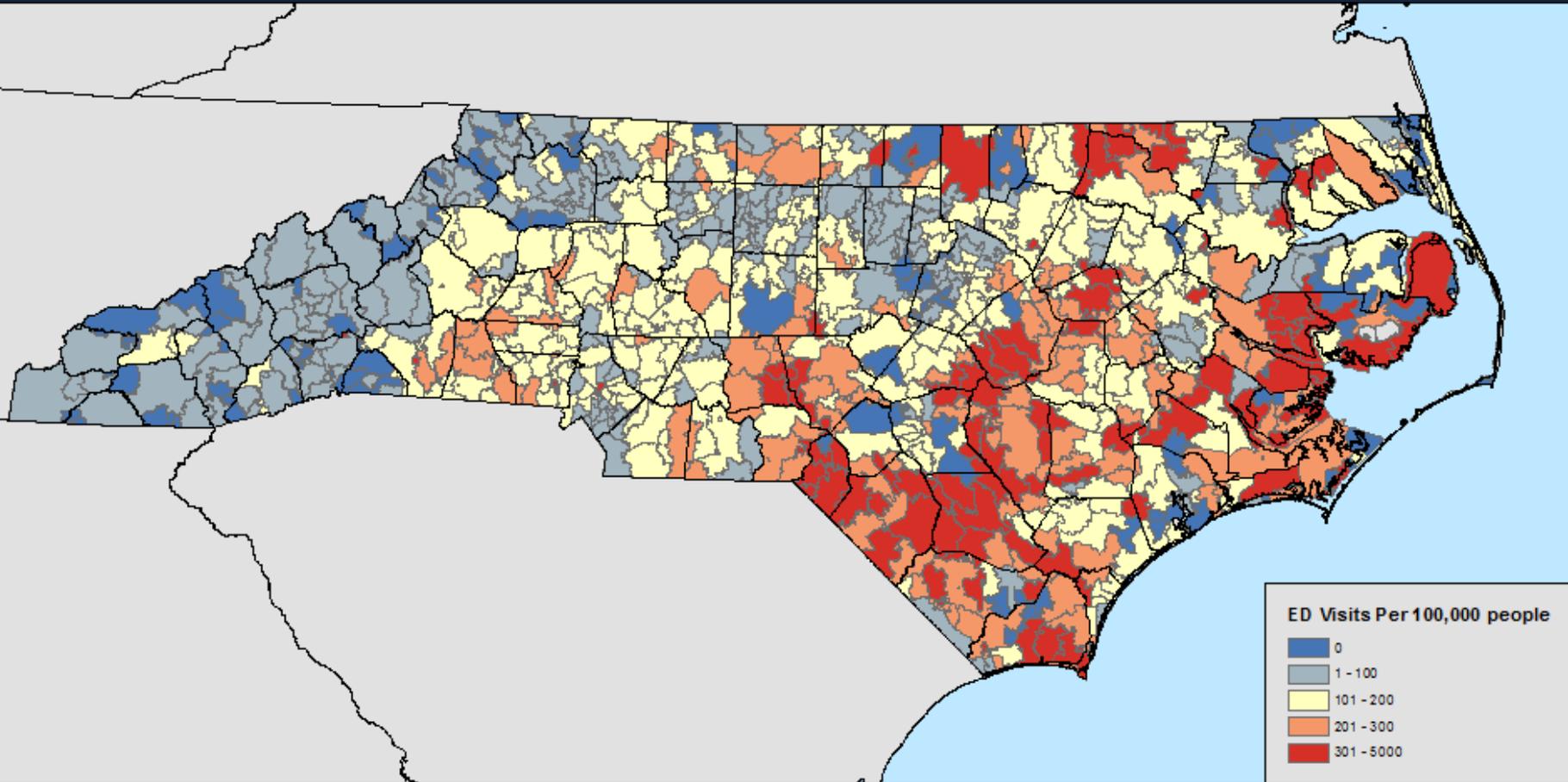
Other CDC BRACE states

Florida & Rhode Island

- **North Carolina Disease Event Tracking and Epidemiologic Collection Tool (NC DETECT)**
- **Age, gender, billing address county/zip code, & insurance info.**
- **Dates Available: 01/01/2007 – 12/31/2012**
- **Acquire all emergency department visits with ICD-9: 992.xx for both primary and secondary diagnostic codes (May – September)**

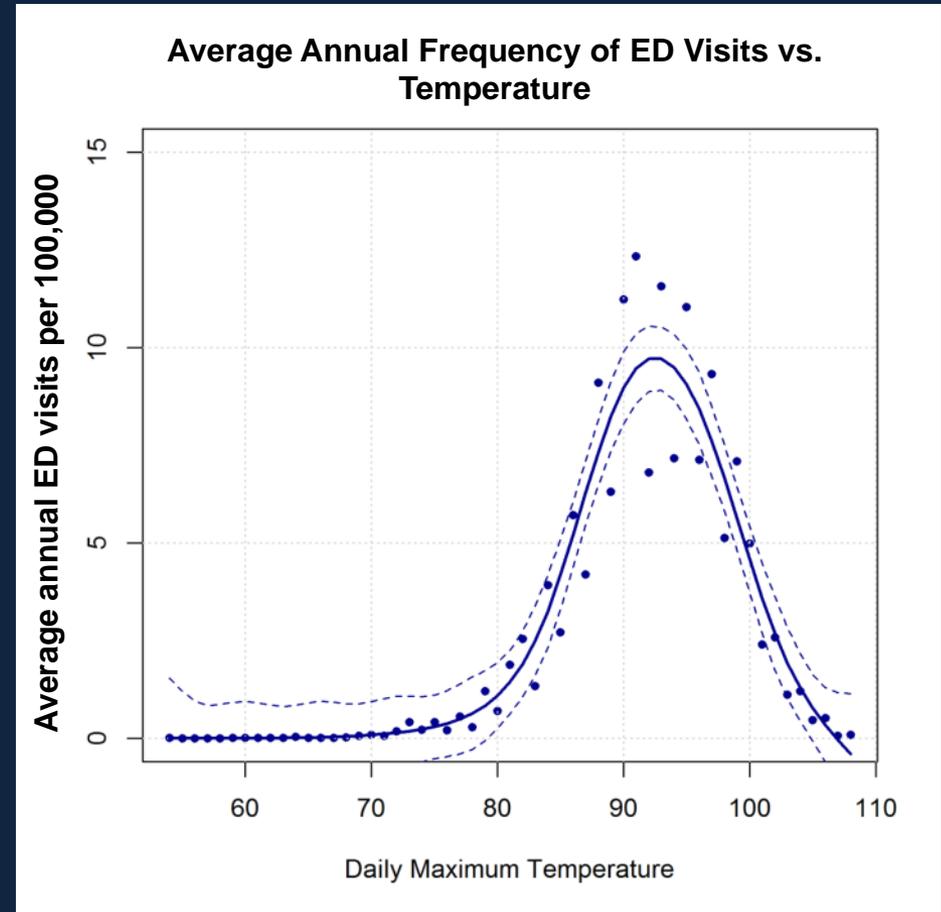


Spatial variations in emergency department (ED) admissions for heat related illness (HRI). Six warm seasons 2007-2012

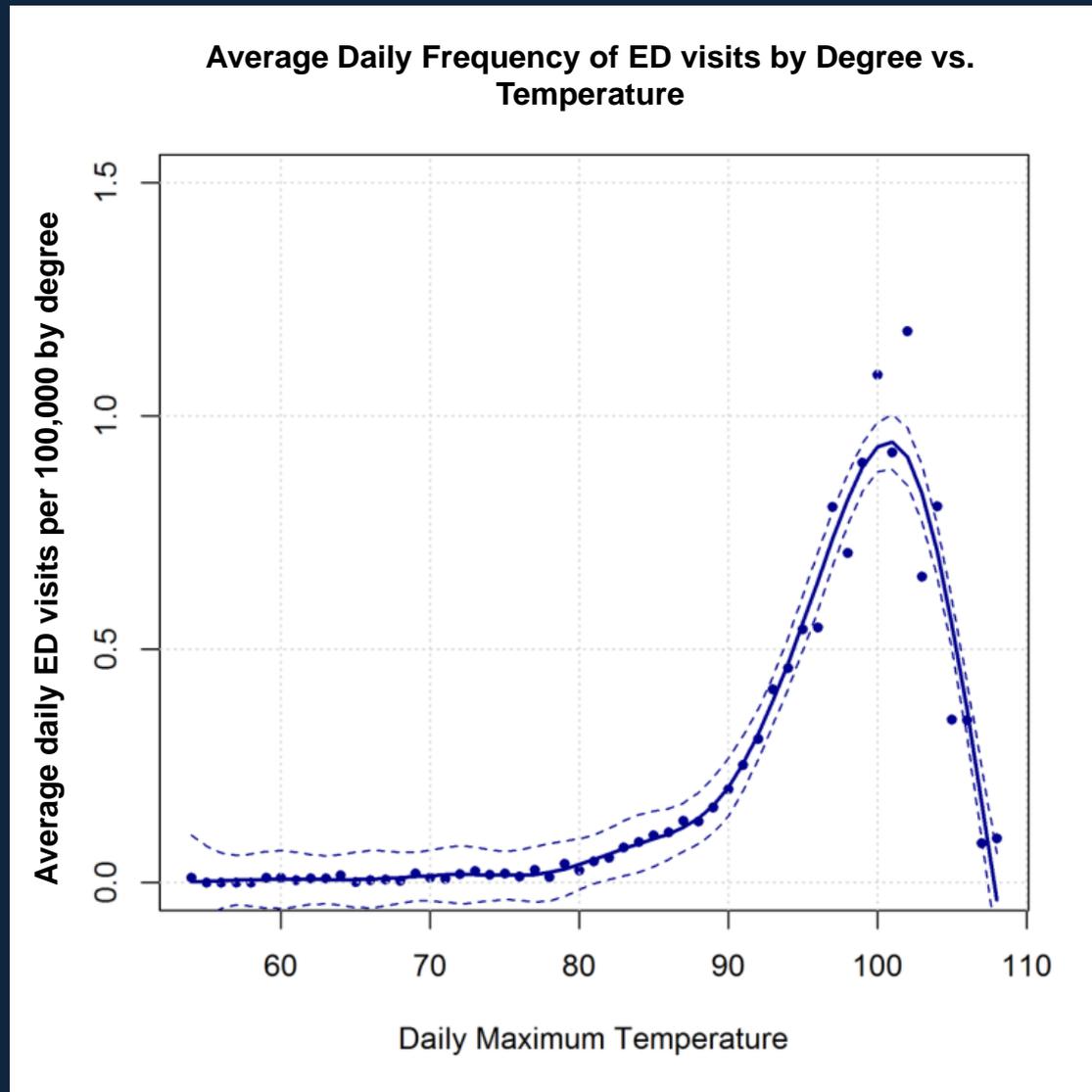


➤ Relationships between heat-related illness (HRI) and temperature

- HRI is standardized by age and sex specific 2010 Census population estimates.
- Best fit relationship identified using a Generalized Additive Model. Determine 95th percent confidence interval.

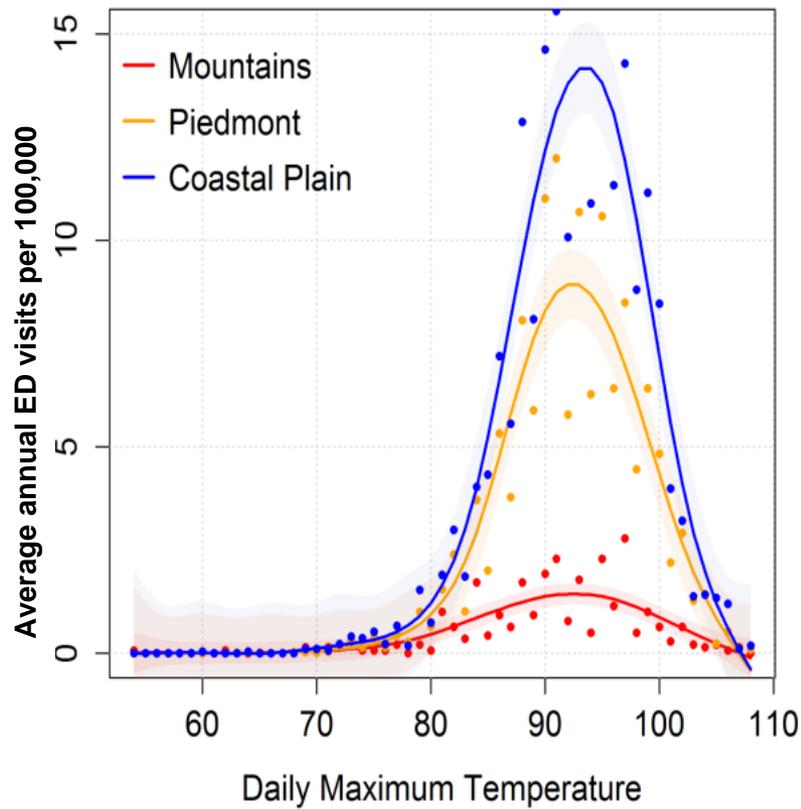


- HRI rates are adjusted for the frequency of temperature observations.
- **Marked decrease in HRI rates at the highest temperatures**

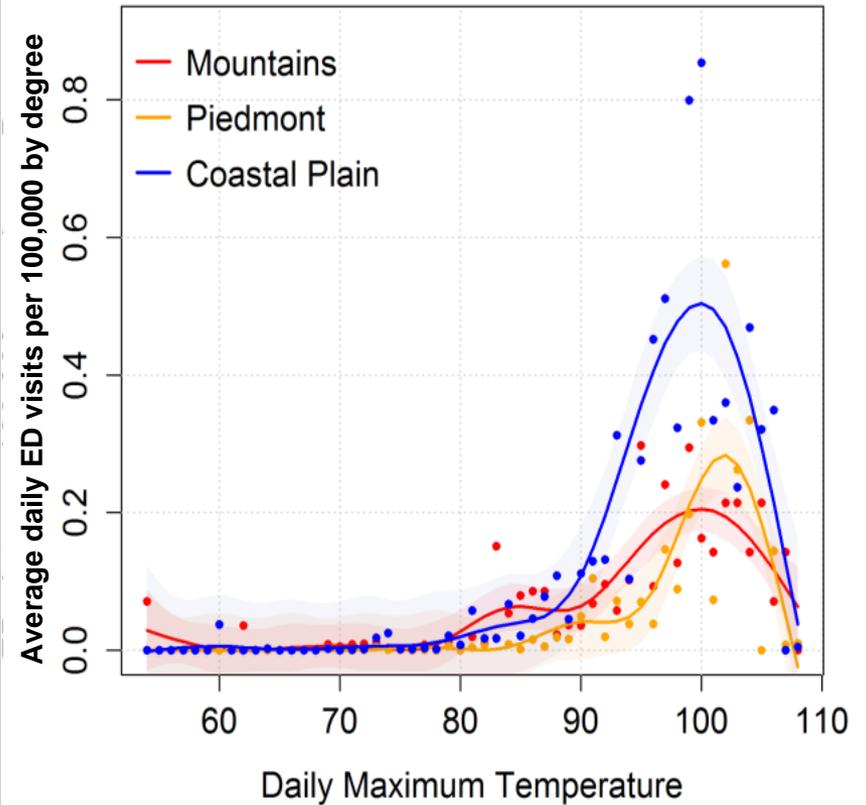


Regional Comparisons across the State

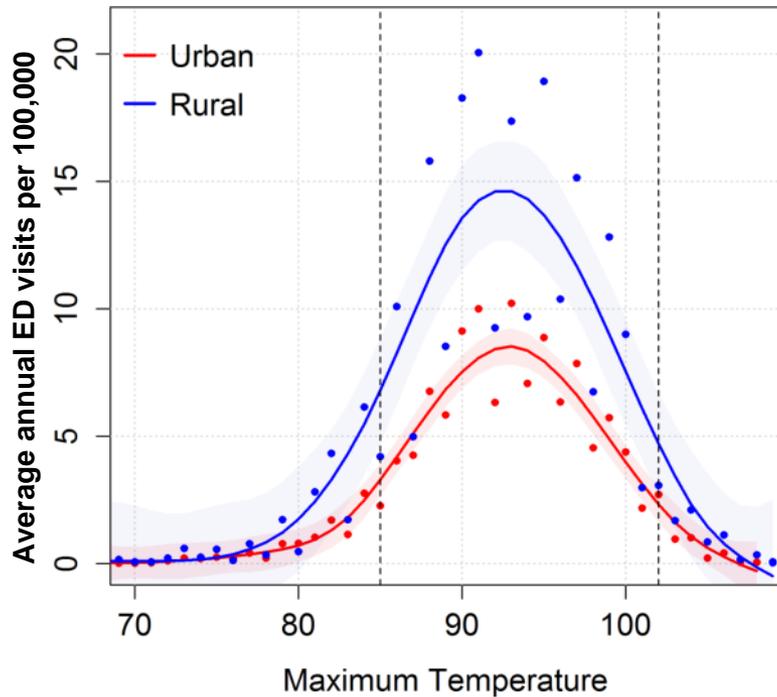
Average Annual Frequency of ED Visits vs. Temperature



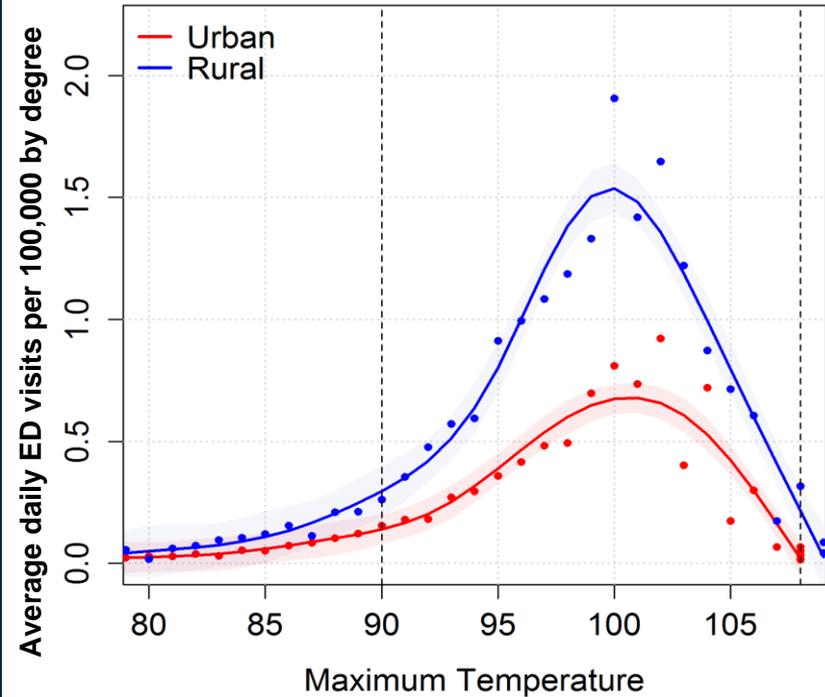
Average Daily Frequency of ED visits by Degree vs. Temperature



Average Annual Frequency of ED Visits vs. Temperature



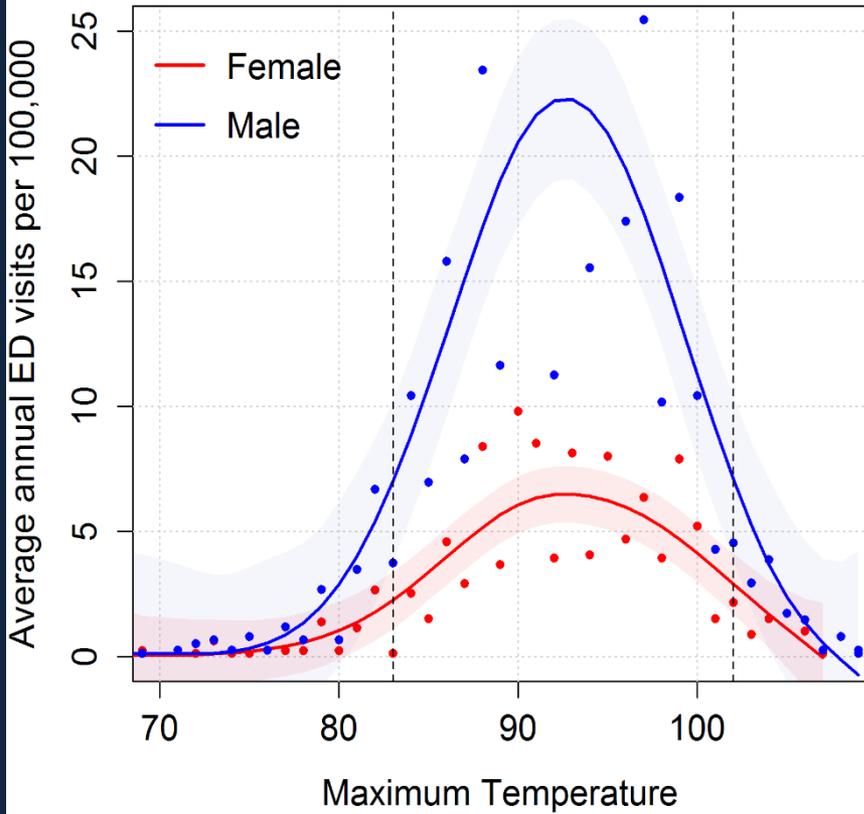
Average Daily Frequency of ED visits by Degree vs. Temperature



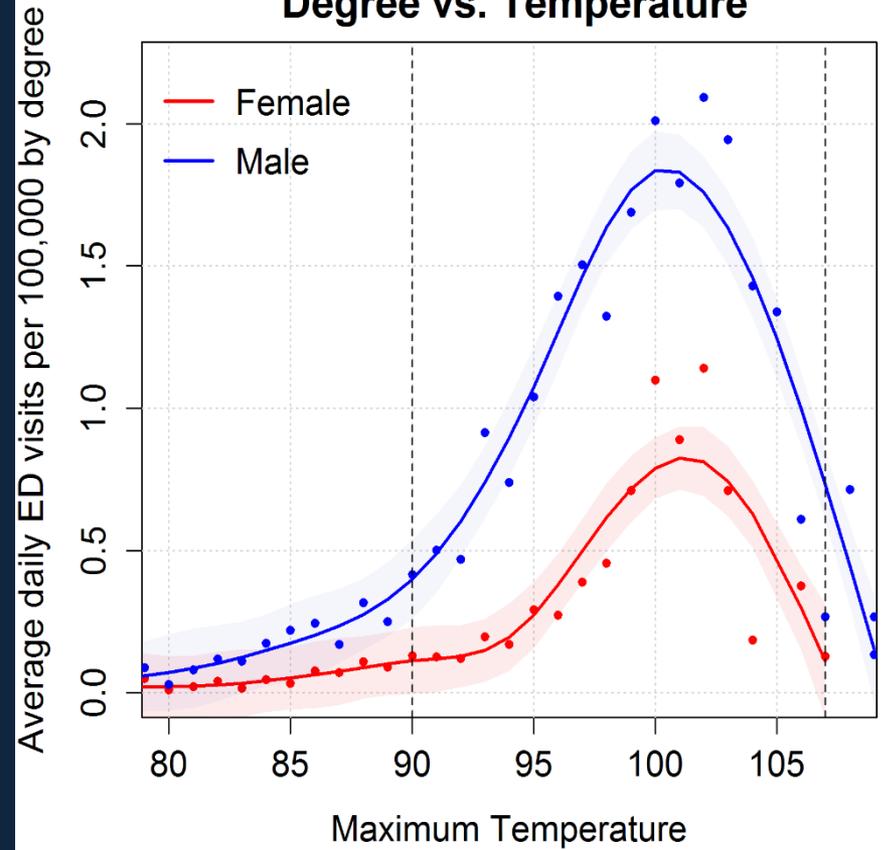
- HRI rates markedly higher in rural areas relative to urban areas.
- Variations in HRI across Piedmont/Coastal Plain of NC may relate to rural character coupled with nature of occupations

Gender differences in the Rural City Region

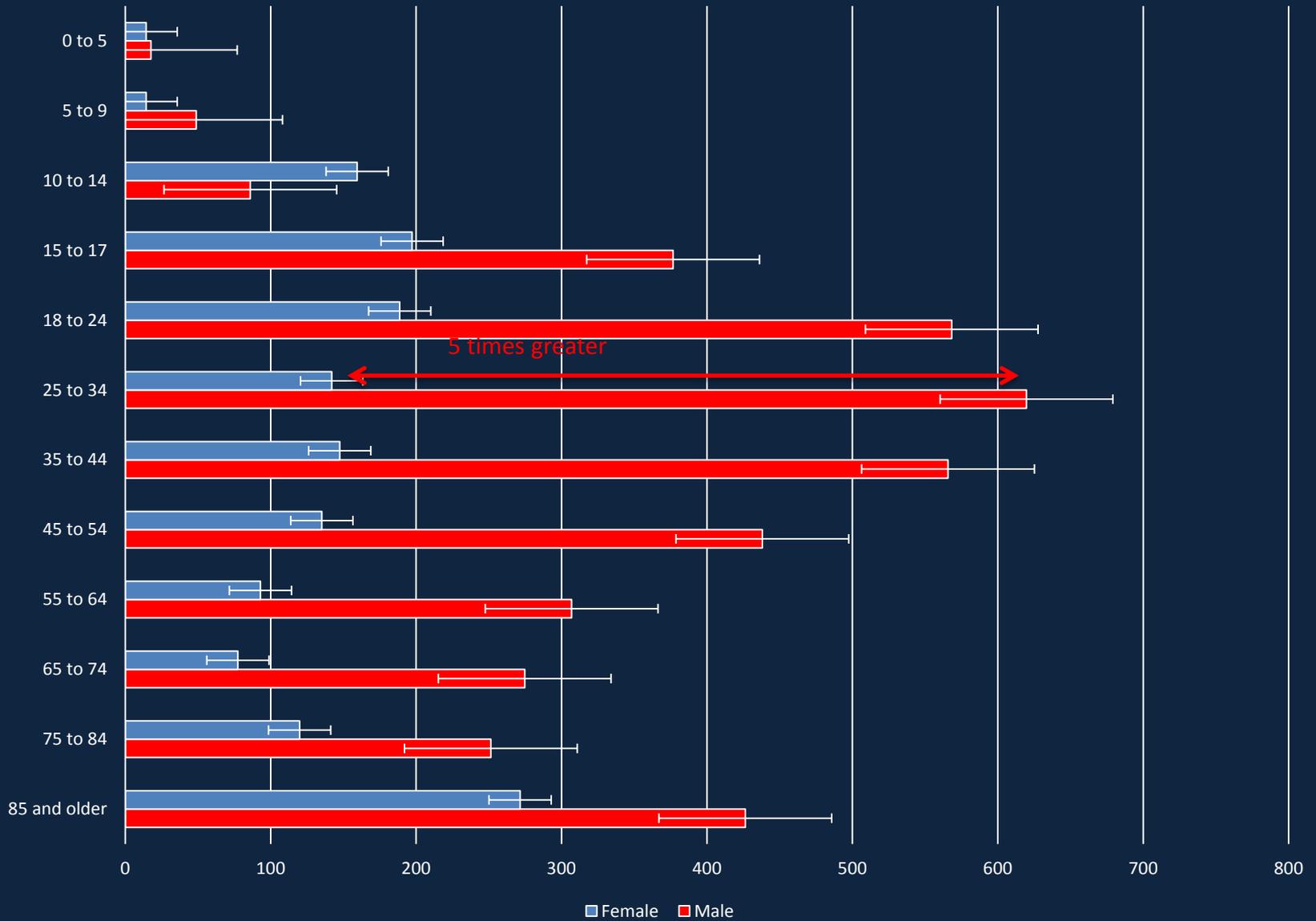
Average Annual Frequency of ED visits vs. Temperature



Average Daily Frequency of ED visits by Degree vs. Temperature



HRI vs. Age & Gender for the Rural City Region



Web-Based Heat-Health Vulnerability Tool

Inputs NWS maximum temperature forecasts and translates these values into predictions of the number of cases of heat illness.

- County or region level
- Demographic/socioeconomic group (e.g. adult males, those in poverty etc.)



Heat Health Vulnerability Tool

Select a county: Bladen County

Select a model: Isolated Rural (Per Capita Degree)

Category

- PerCapitaDegree
- Upper / Lower

Choose a display color: Red

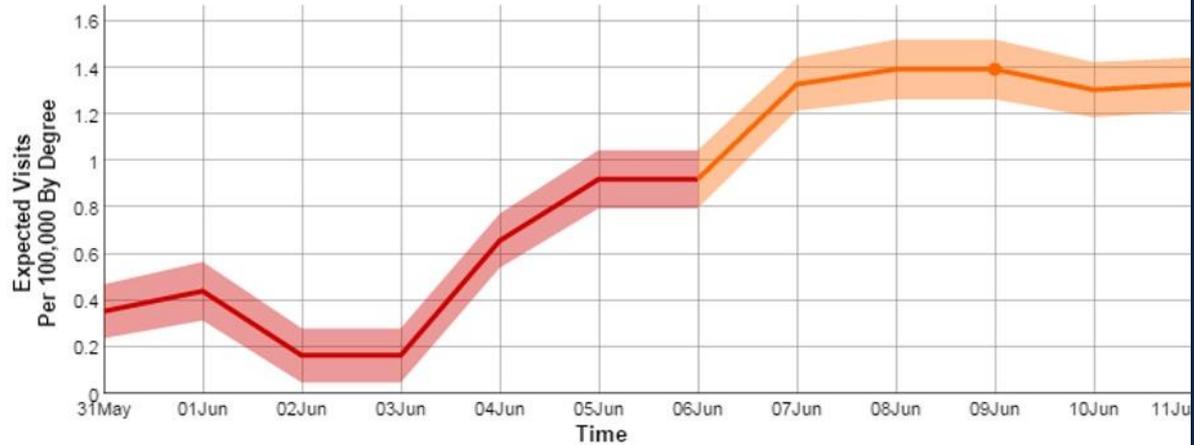
Choose a valid forecast date: August 10 2013

Graph

Isolated Rural (Per Capita Degree) Model for Bladen County at Brown Field (KEYF)

Observations from 2008-05-31 through 2008-06-06

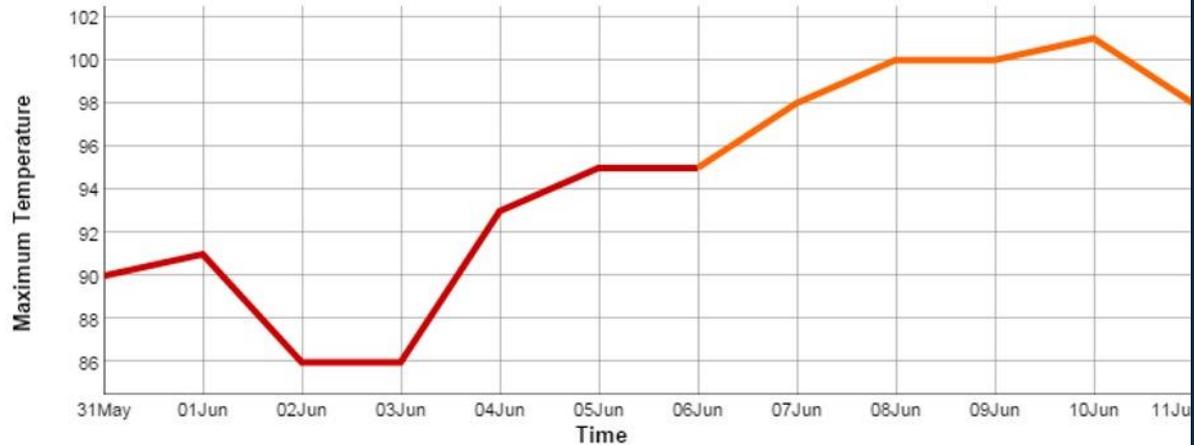
Daily forecasts valid 2008-06-07 through 2008-06-11



Maximum Temperature for Bladen County at Brown Field (KEYF)

Observations from 2008-05-31 through 2008-06-06

Daily forecasts valid 2008-06-07 through 2008-06-11



User Engagement with the Heat Illness Tool

Collaboration with NC CDC BRACE Program (Lauren Thie)

- Identify and grow a user group that includes county level health departments, emergency room personnel, and NWS
- Hold user engagement sessions to introduce tool (May) and get feedback on this use (September).
- Refine tool on the basis of the feedback

Goal is to provide guidance for

- Targeted messaging
- Emergency room staffing
- Refinement of NWS heat watches/warnings

Acknowledgements

- NOAA funded Southeast Regional Climate Center (SERCC)
- NOAA funded Carolinas Regional Integrated Science and Assessments (CISA) program
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- NSF Doctoral Dissertation Improvement Grant NSF 11-547 (Maggie Kovach)
- Climate Change – Public Health working group at UNC- Chapel Hill
- North Carolina Department of Health and Human Services

The NC DETECT Data Oversight Committee does not take responsibility for the scientific validity or accuracy of methodology, results, statistical analyses or conclusions presented.

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