



**ABSTRACT**

Climate change is occurring in the Southeastern United States and one manifestation is changes in frequency and intensity of extreme events. A vulnerability assessment is performed in the state of Georgia (United States) at county level from 1975 to 2012 in decadal increments. One unique aspect is the consideration of both gradual changes in temperature and precipitation as well as extreme hydroclimatic events such as flood, drought and heat wave. The main objective of this study is to combine climatic and social components together into a unified vulnerability assessment capturing both long-term change and episodic events. Climate change vulnerability indices are derived for the 1980s, 1990s, 2000s, and 2010s.

Greater anomalies in temperature and precipitation with an overall trend towards drying and warming have been observed. Our results capture the anomalous cooling period in Georgia during the 1970-1980 period as well as the post-1980 warm-up. A clearly established increase in extreme hydroclimatic events is also detected in recent decades. Climate vulnerability is highest in some metropolitan Atlanta and coastal counties. However, the southwestern region of Georgia, and part of the rural Black belt region are found to be climate change-vulnerable.

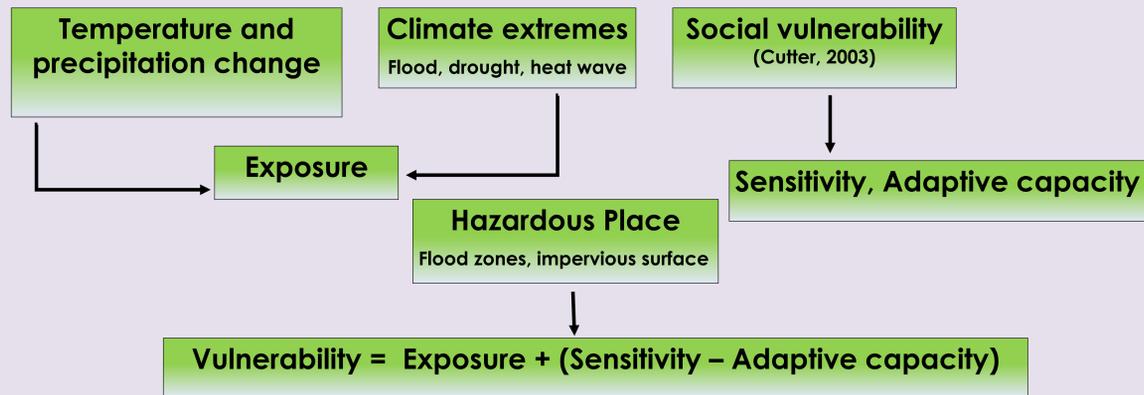
**OBJECTIVES**

- To develop a vulnerability index for counties in Georgia from 1975 to 2012 at decadal span
- Assess spatial variation of vulnerability to climate change
- Provide a tool for decision makers and stakeholders to identify vulnerable and exposed populations

**DATA**

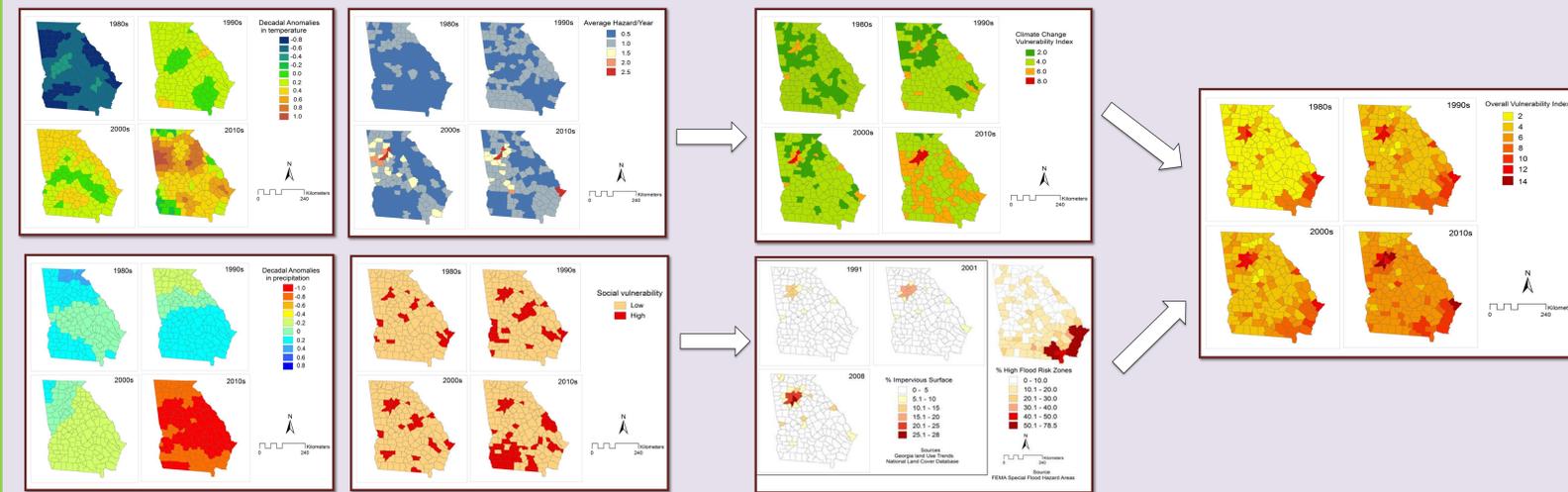
- Temperature and Precipitation
- NOAA's United States Historical Climatology Network (USHCN)
- Extreme events
- Divisional Historical Palmer Drought Severity Index (PSDI)
  - Spatial Hazard Events and Losses Database for the United States
- Socioeconomic
- Census Bureau of statistics
  - American Medical Association
  - USDA-NASS census of Agriculture
- Place based hazard
- Georgia Land Use Trends
  - National Land Cover Data set
  - Federal Emergency Management Agency (FEMA)- SFHA

**METHODOLOGY**



**Vulnerability = exposure, sensitivity, adaptive capacity (IPCC, 2007)**

**RESULTS**



**CONCLUSIONS**

- Anomalies in temperature and precipitation have increased in recent decades with warmer and drier conditions than during 30 year period from 1971 to 2000.
- Extreme hydroclimate events like flood and drought have also increased in frequency in the study region, particularly metropolitan Atlanta.
- The metro Atlanta counties and Black belt counties in Georgia emerged as socially and climatologically vulnerable.
- This study provides a broader perspective into vulnerability from past climate change as well as helpful to determine risk from potential climate change in future and in coastal counties in Georgia.
- The end results will help the planning agencies to develop strategies for adaptation to climate change in vulnerable counties.

**ACKNOWLEDGEMENT**



**REFERENCES**

IPCC, 2007: Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change [Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K.B. Averyt, M.Tignor and H.L. Miller (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

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