

Regional Climate Modeling and Decision Aids

Background

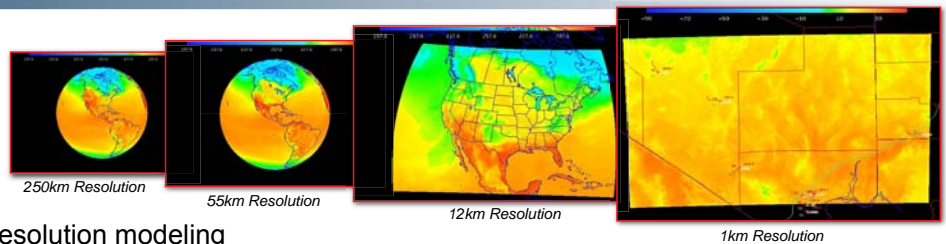
- The earth is warming beyond the observed natural climate variability
- Measurable effects of climate change will be felt over the next 50 years
- The need to adapt to an evolving climate will be critical to society

Objective

- Downscale coarse resolution global climate model data by running an ensemble of high resolution Regional Climate Models (RCM's)
- Develop regional decision aids that translate RCM data into actionable information to support climate mitigation and adaptation efforts

Climate Modeling

- State of the art **global** climate models consist of atmospheric, ocean, land surface and sea ice components
- The atmospheric model runs at very coarse resolution
- Impacts of climate will be felt on the regional scale, requiring much higher resolution modeling
- Simulations of future climate scenarios produced with high-resolution climate models show features and trends in temperature and precipitation that are not resolvable by global models.



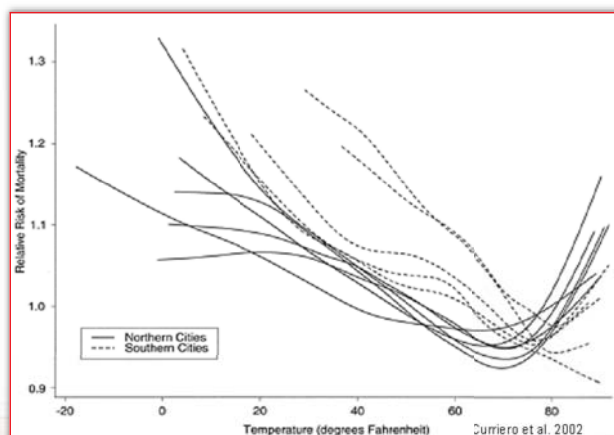
Climate Decision Aids

- State of the art RCM's are required to answer questions related to climate adaptation
- Adaptation strategies emphasize different temporal scales, cost level, target audience, technology and policy decisions and decision rules
- Specific decision aids will be developed that address the health, energy, agriculture, and water management industries

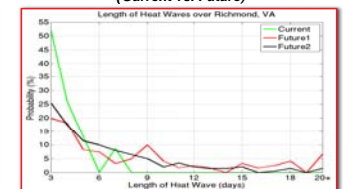
Climate Decision Aid Example

- Heat waves cause more deaths than hurricanes, lightning, tornadoes, floods, and earthquakes combined
- Lack of public recognition
- No damage to infrastructure (silent killer)
- Many deaths go unreported or unattributed
- A decision aid that provides guidance on future heat wave potential over CONUS will assist local planners in reducing mortality

Temperature-Mortality Relation for 11 U.S. Cities, 1973–1994



Heat Wave Potential at Richmond, VA (Current vs. Future)



Change in Heat Wave Days Experienced (Current-Future) (2038-2070)

