

Dept. of Environment & Natural Resources



PLANNING FOR CLIMATE CHANGE

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How will climate change affect our lakes?

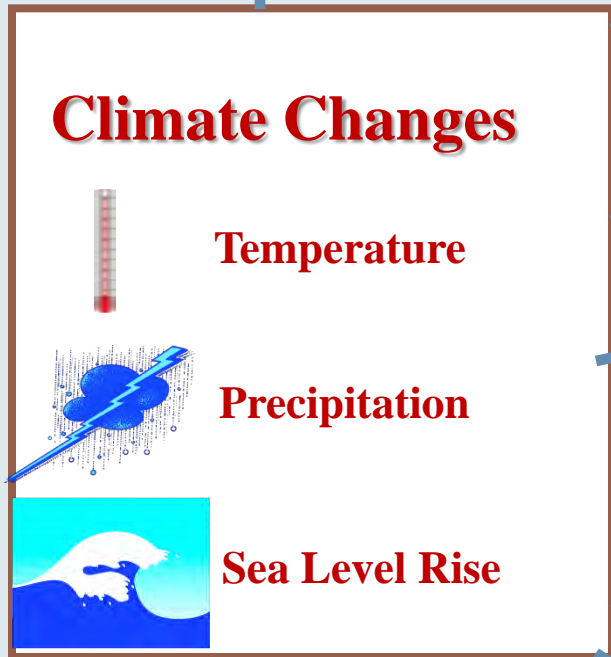


Potential Impacts of Climate Change



Infrastructure

Water
Transportation
Energy Supply & Use



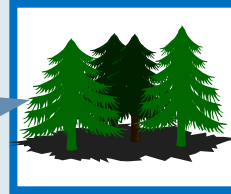
Health

Weather-related Mortality
Infectious Diseases
Air Quality -Respiratory Illnesses



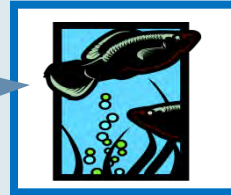
Agriculture

Crop yields
Irrigation demands



Forest

Change in forest composition
Shift geographic range of forests
Forest Health and Productivity



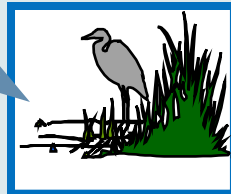
Water Resources

Changes in water supply
Water quality
Increased competition for water



Coastal Areas

Erosion of beaches
Inundate coastal lands
Costs to defend coastal communities



Wildlife and Ecosystems

Shift in ecological zones
Loss of habitat and species
Damage to Coral Reefs



Cultural Resources



Economic Disruption

Big 3 Climate Change Impacts



Temperature

- **How hot?**

Precipitation

- **How wet? How dry?**

Sea Level Rise

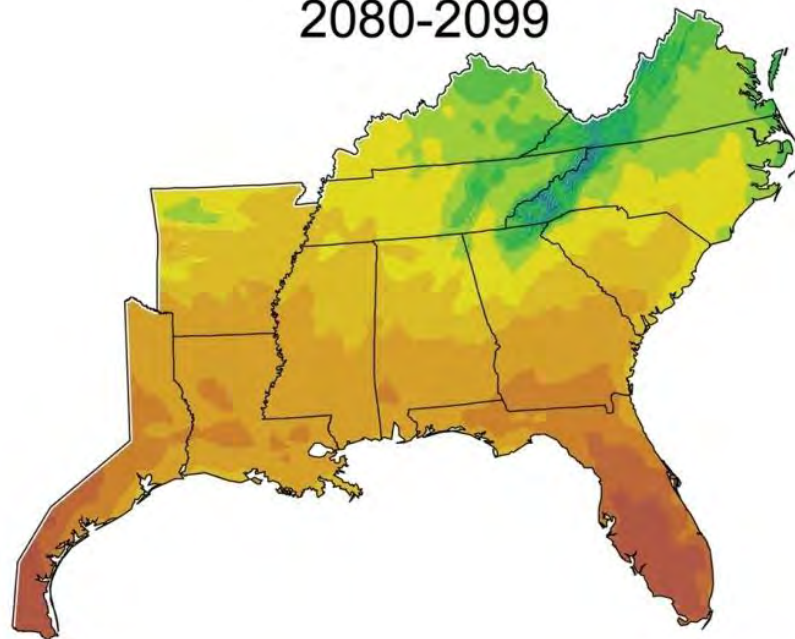
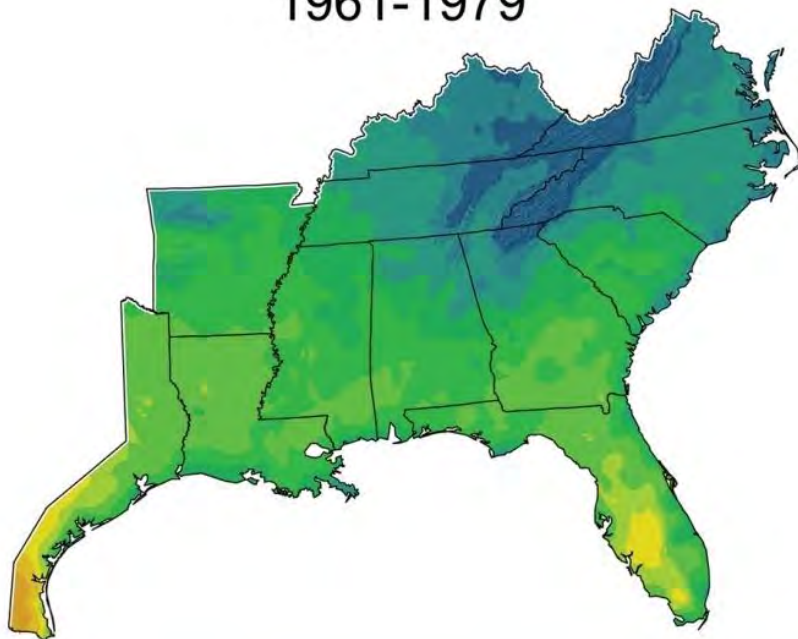
- **How deep? Where?**

More days with peaks over 90 degrees



1961-1979

2080-2099

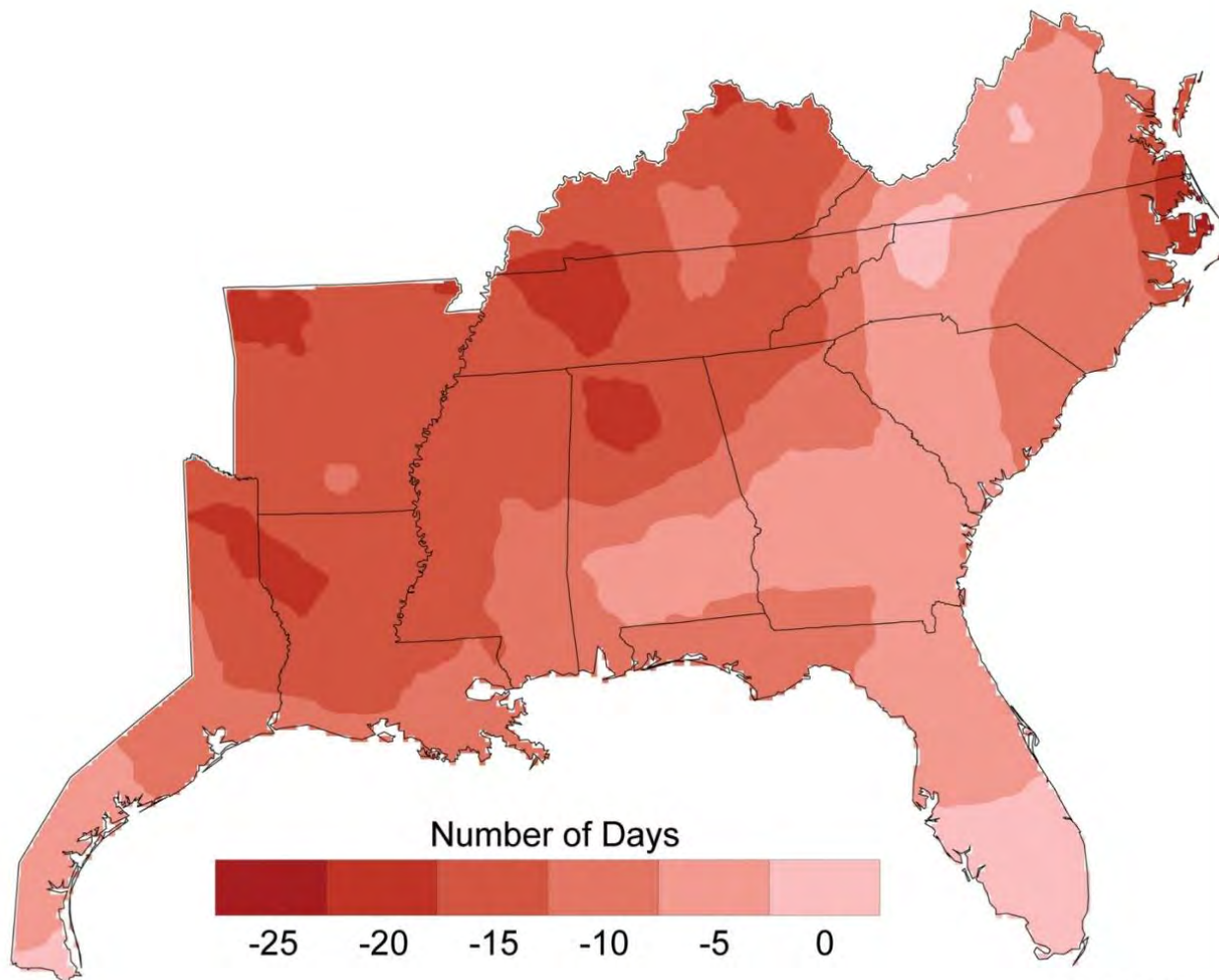


CMIP3-B¹¹⁷

Fewer days that dip below freezing



Change in
Freezing Days
per Year
1976 to 2007



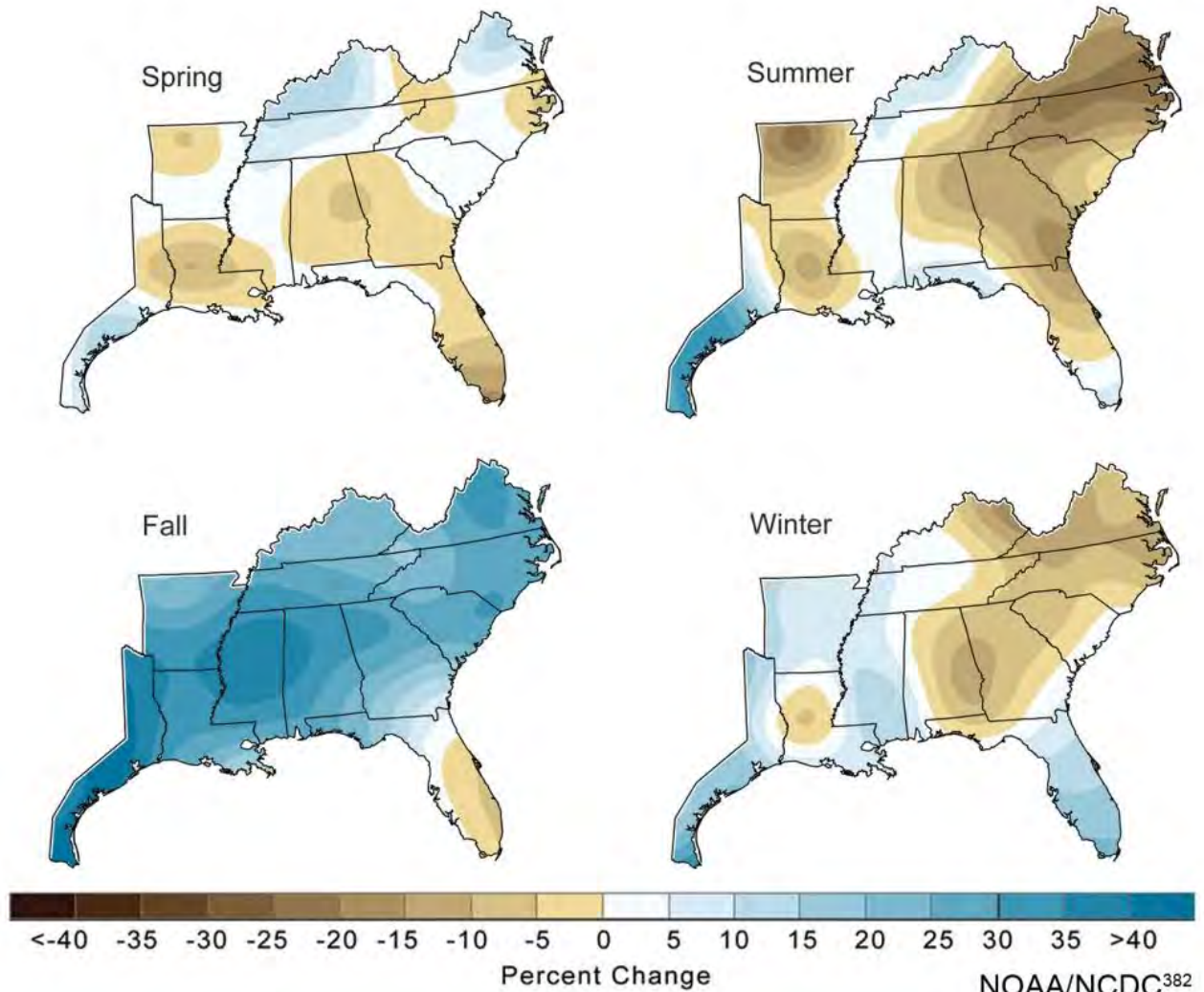
N.C. Temperature Projections



- N.C. temperature regime by 2100 will be like central Florida today.
- Warming trend of 4-5° in winter and 6-7° in other 3 seasons is extremely likely.
- Heat waves will likely become more frequent, longer lasting and more intense.

Shifts in timing & amount of precipitation

Observed changes in precipitation (1901 to 2007)



N.C. Precipitation Projections



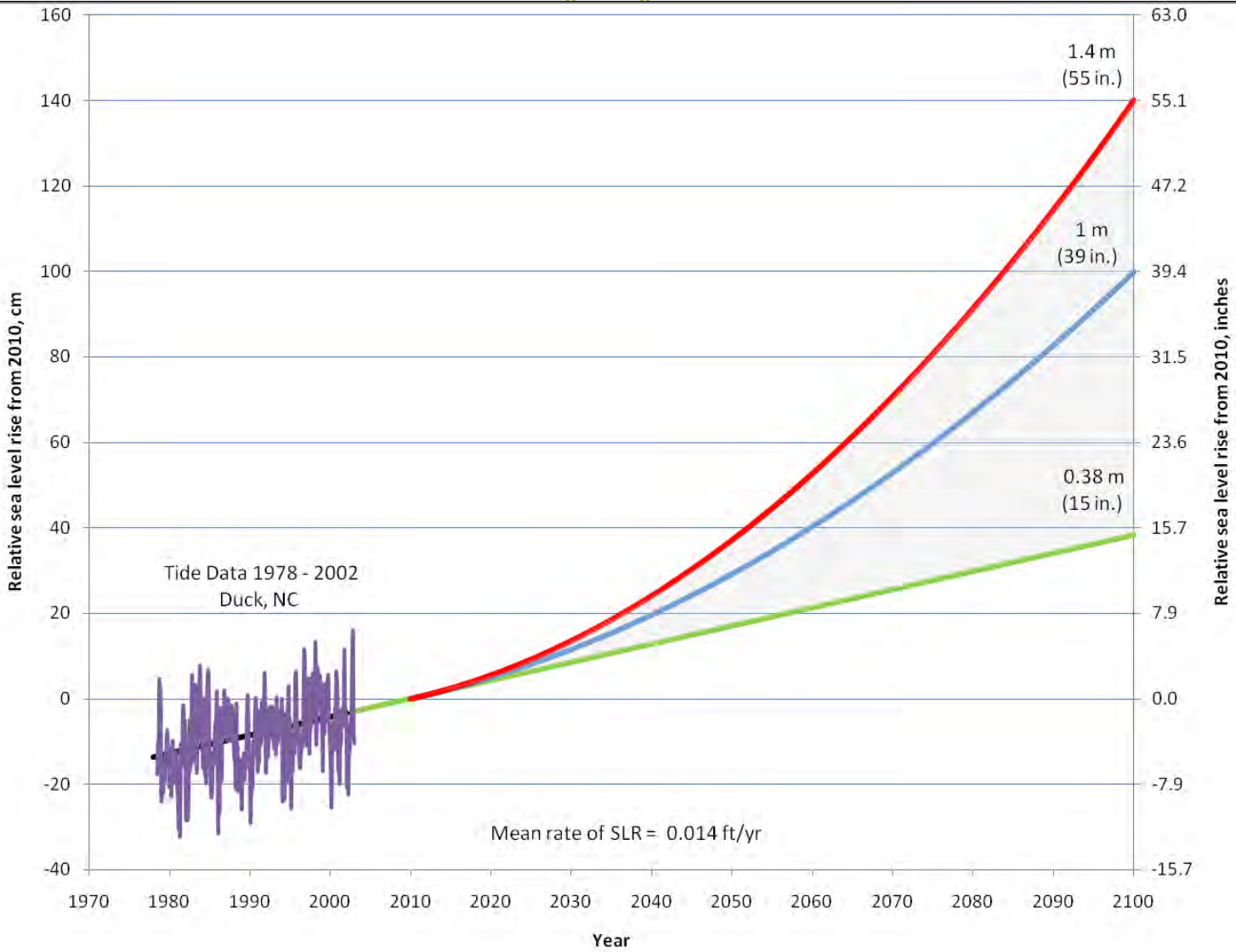
- **“Wetter wets & drier dries”**
- **Rainfall will likely be less frequent, but more intense.**
- **It is very likely that NC will experience more droughts.**
- **Increased precipitation is most likely in fall or winter, with drier summers.**

N.C. Sea Level Rise Projections

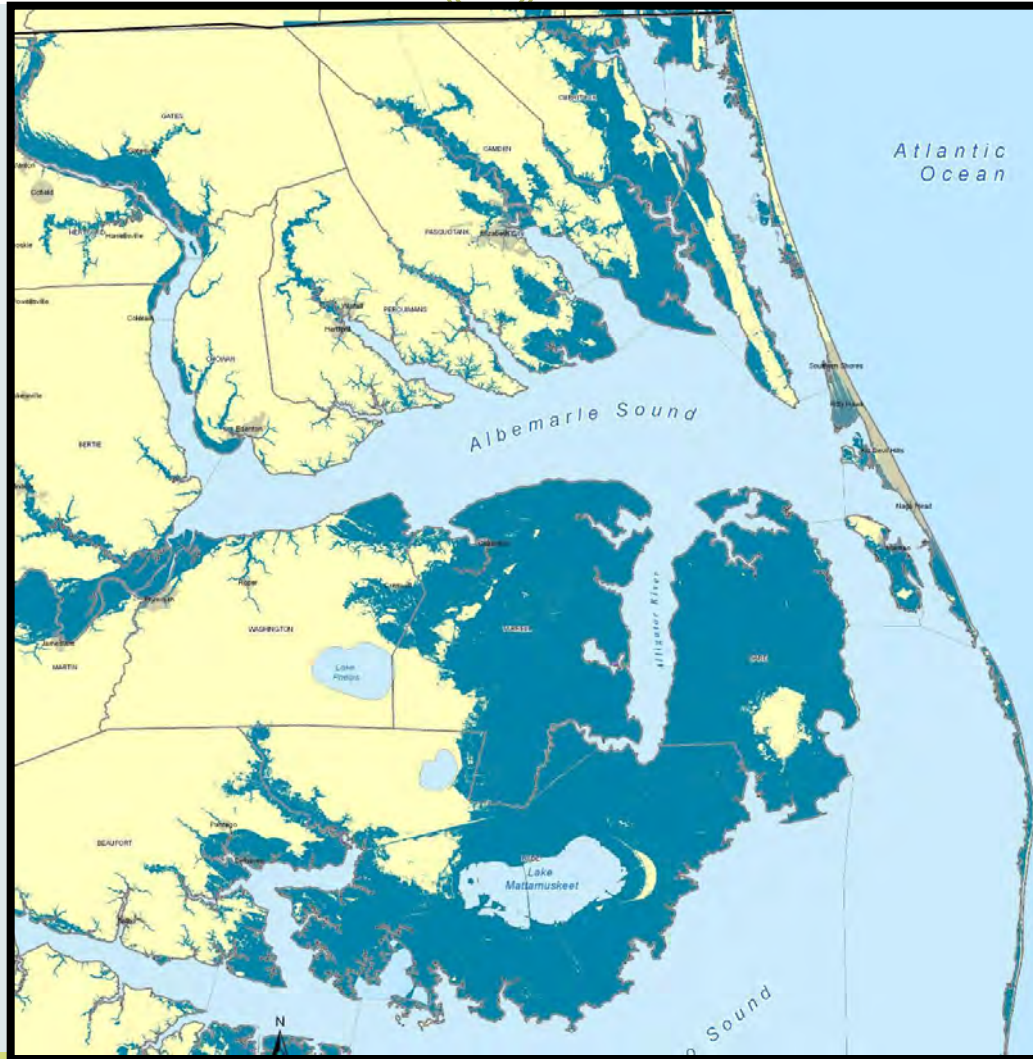


- North Carolina is projected to be among 3 worst states in impacts of Sea Level Rise
- Much of our coastline will likely be inundated.
- Increased storm intensity and frequency will produce higher storm surges.

NC Sea Level Rise Projections



Albemarle under 1 meter of water



DENR Strategic Plan:



Develop a focused approach to address climate change policy actions at state, regional and federal levels.

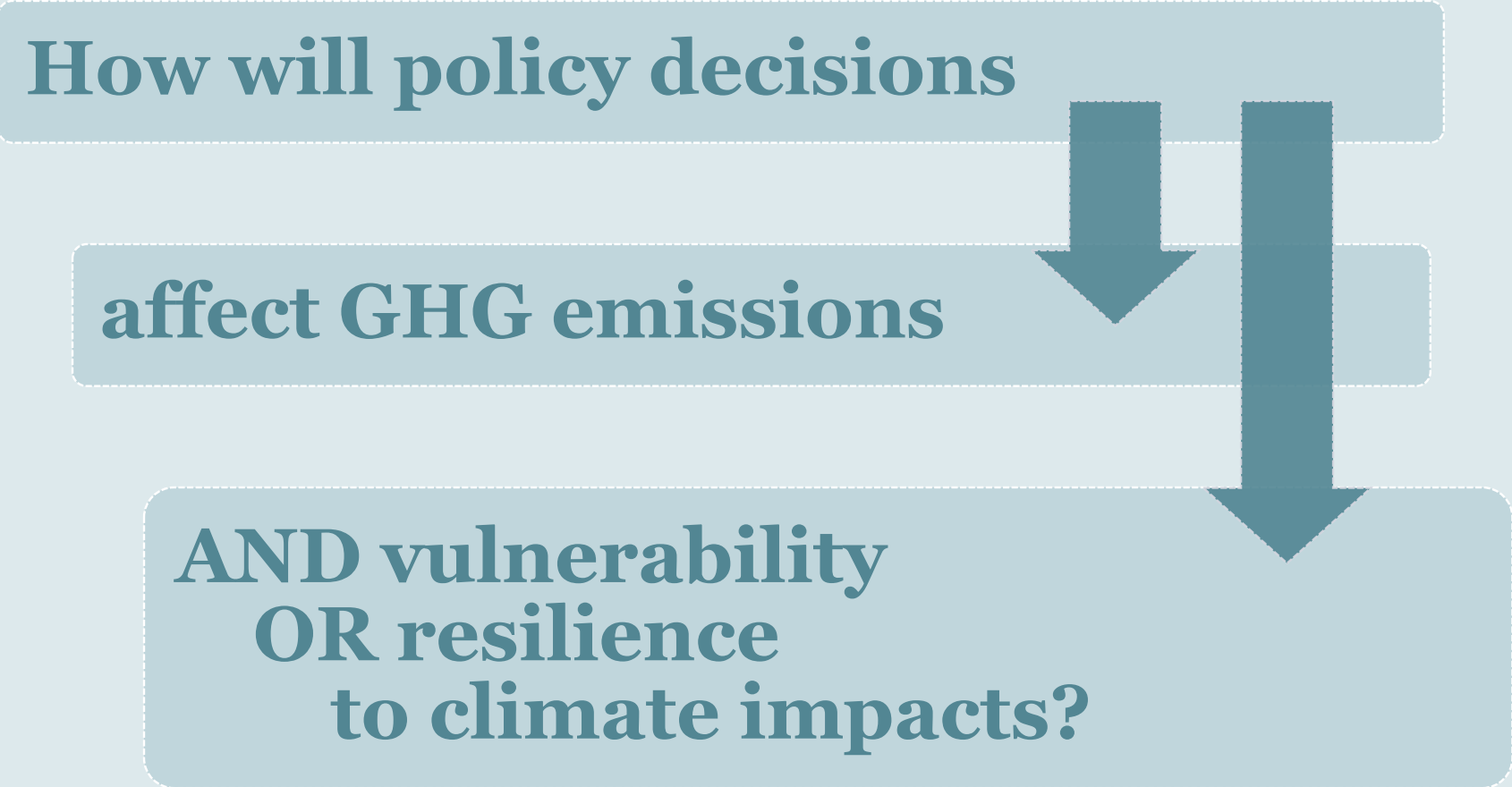
Ask the Climate Question



How will policy decisions

affect GHG emissions

AND vulnerability
OR resilience
to climate impacts?



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graph TD; A[How will policy decisions affect GHG emissions] --> B[AND vulnerability OR resilience to climate impacts?];
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DENR Strategic Plan:



Address climate change in a comprehensive way, using mitigation and adaptation strategies to increase resilience of North Carolina's resources to these complex changes.

Mitigation Strategies



Reduce Greenhouse Gas contributions to climate change, as recommended by CAPAG.

Mitigation Sectors

- 1. Greenhouse Gas Emissions Regulation and Tracking**
- 2. Greenhouse Gas Emissions Reduction**
- 3. Green Energy Development**
- 4. Carbon Sequestration**

Adaptation Strategies



Proactively prepare for and adapt to changes we can't prevent.

Adaptation Sectors

- 5. Sea Level Rise Adaptation**
- 6. Climate-Sensitive Ecosystems**
- 7. Water Management**
- 8. Public Health Impacts**
- 9. Emergency Management Preparedness**
- 10. Land Use Planning and Development**

How Changes in Air/Water Temp. could affect Water

Water Availability

Reduced ground & surface water supply



Water Quality

Increased runoff resulting in erosion and sedimentation



Increased water demand due to higher temperatures



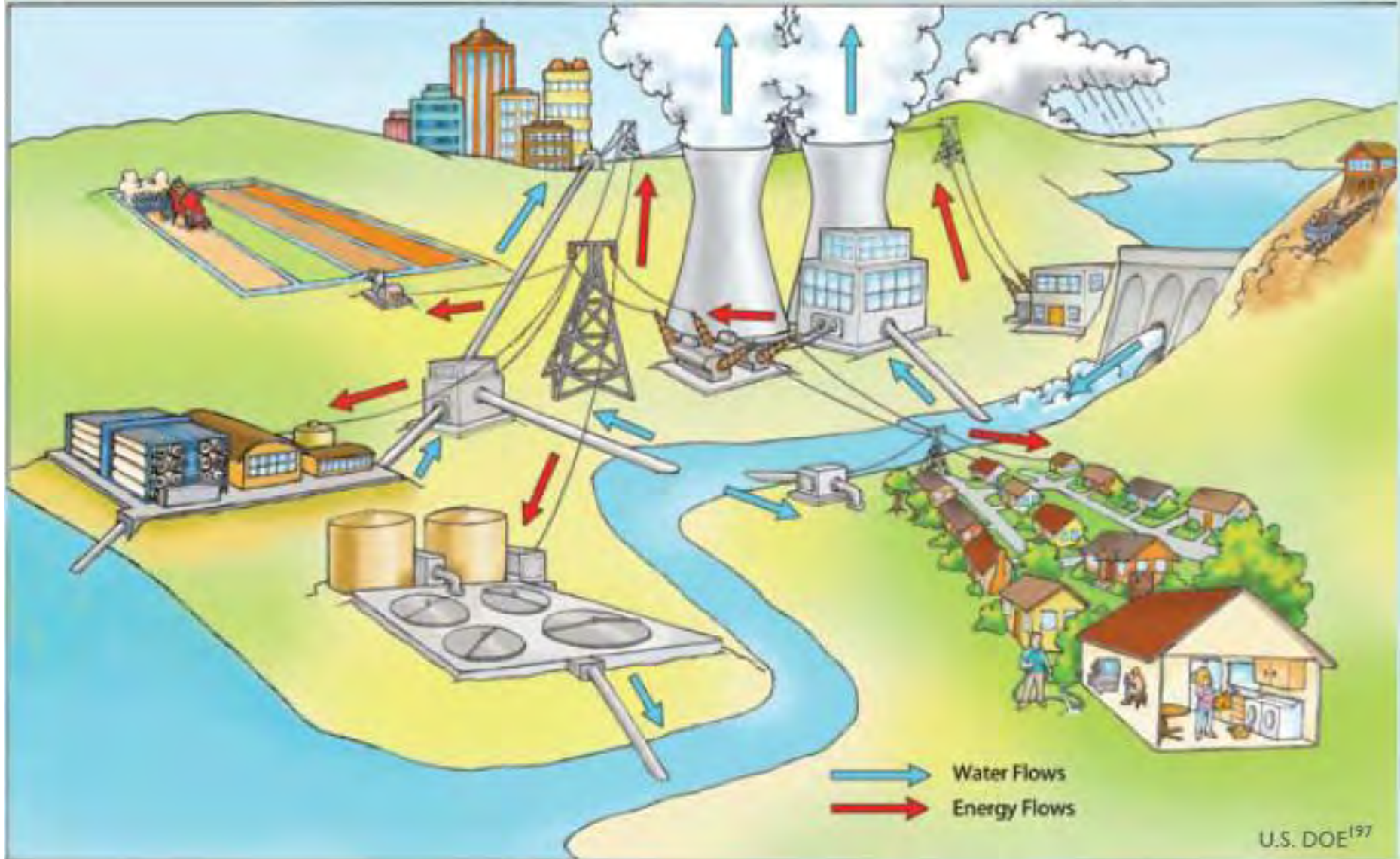
telegraph.co.uk

Overwhelmed water infrastructure due to flooding



wakeupwakecounty.com

Link between Energy and Water



Examples of Water Resource Decisions Related to Climate Forecasts

Decision/Topic	Examples of Activities Affected	Climate Forecast Info
Public water supply/waste water management	<ul style="list-style-type: none"> • New wastewater treatment facilities, reservoirs, dams, etc. • Long-term water supply and demand management plans • Drought Planning 	<ul style="list-style-type: none"> * Changes in temp., precipitation * Reductions in base-flows * Greater evaporation rates
Irrigation/water allocation for agriculture / aquaculture	<ul style="list-style-type: none"> • How much water • When to allocate it • Where to allocate it 	<ul style="list-style-type: none"> • Long/short term precipitation • Long/short term temp
Coastal Zones	<ul style="list-style-type: none"> • Erosion: marsh deterioration • Flood control, water supply, sewage treatment • Fish production, coastal food systems, salt water intrusion 	<ul style="list-style-type: none"> • Tropical storms • Changes in precipitation patterns • Wind changes • Storm surges

DENR's Partners in Planning



- 1. LCGCC has recommended DENR lead development of climate change adaptation strategy**
- 2. Interagency Leadership Team is involved in development of a Climate Action Plan for the state.**
- 3. Working with National Climate Data Center to develop down-scaled NC assessments.**
- 4. Coordinating with universities; federal, state and local government agencies; NGOs.**

For More Information



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