

Water Resources: An assessment of the Lower Cape Fear Basin

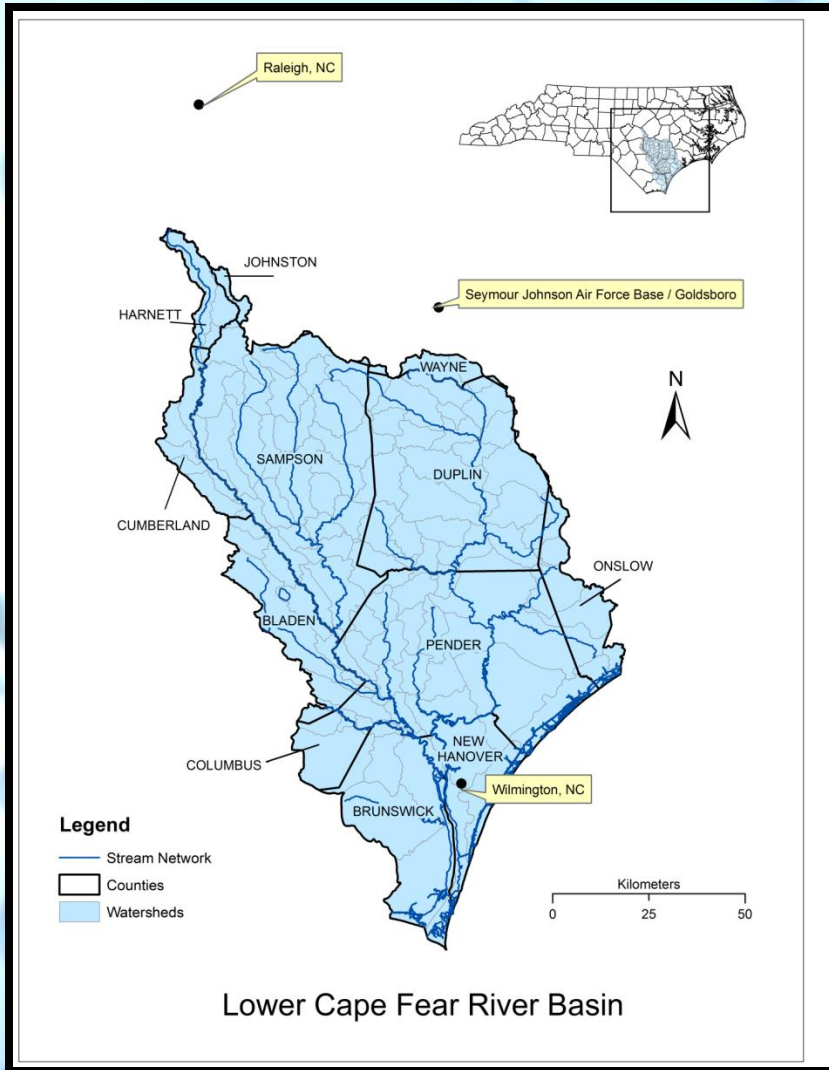
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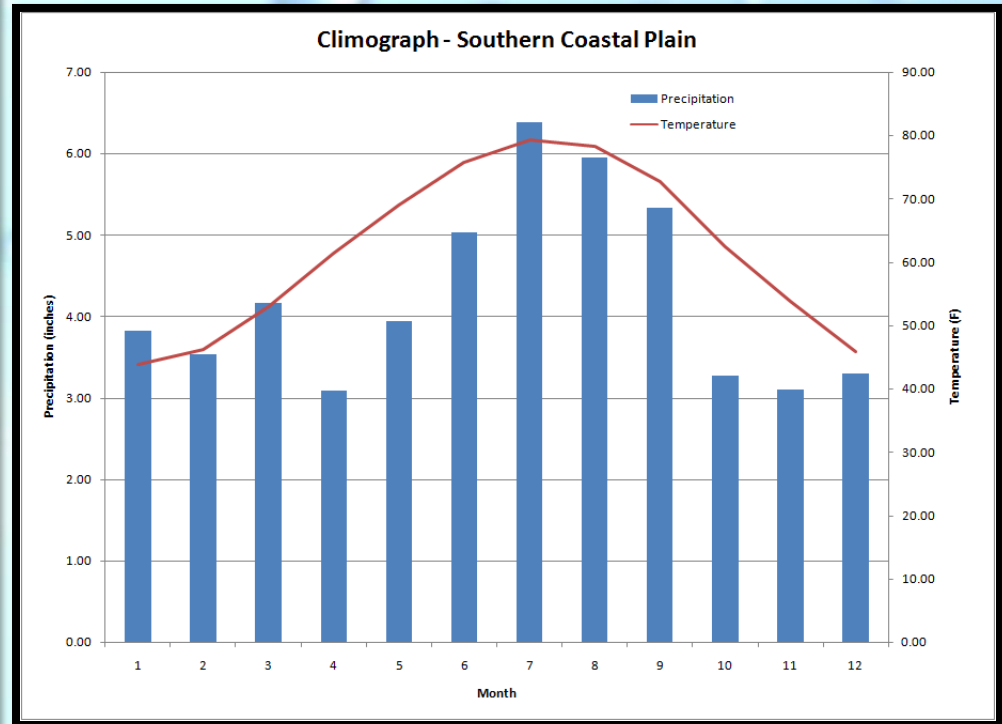
East Carolina University



Study Area



- Mean annual precipitation : 50.92 inches
- Average temperature: 61.77° F

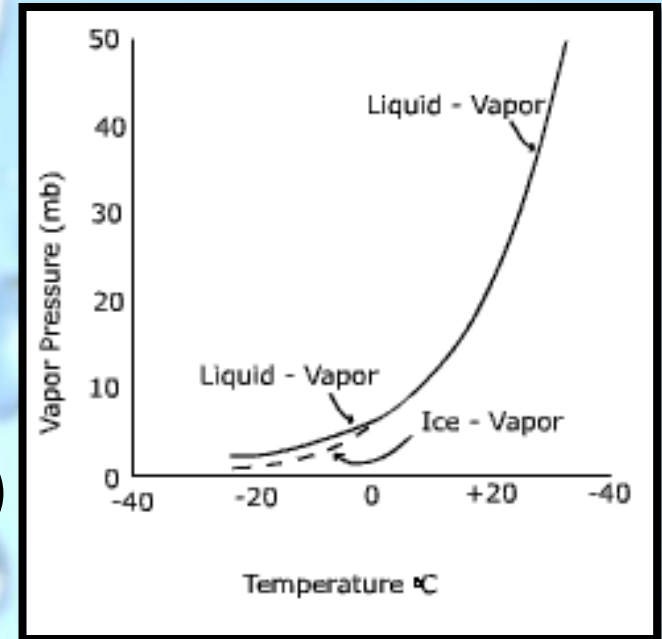


Problem

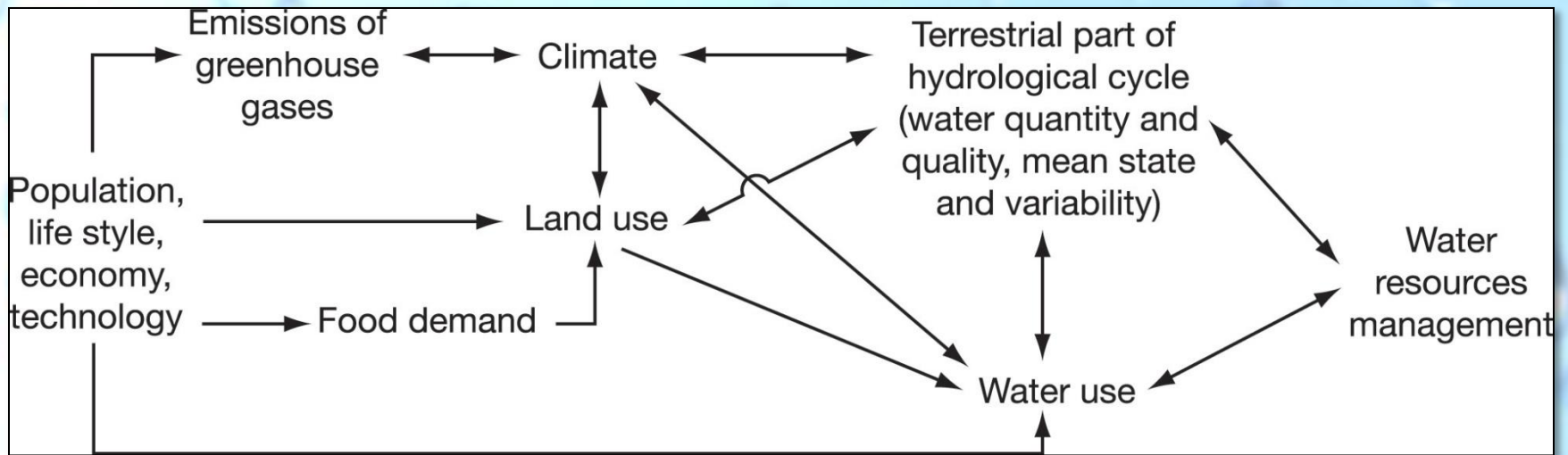
- Overall decrease in future water availability in Coastal North Carolina
 - Leading to a decrease in the water resource health
 - Increased Stress (water availability $<1700 \text{ m}^3 \text{ PPY}$)
 - Increased Scarcity (water availability $<1700 \text{ m}^3 \text{ PPY}$)
 - Drivers include:
 - Climate Change
 - Population Growth

Climate Change

- Hydrologic Cycle
 - Intensification
 - Water Quality issues
 - Temperature Increase
 - Increase in Evapotranspiration (ET)
 - Decreased runoff
 - Precipitation Increase
 - Change in seasonality
 - Increases in evaporation likely to exceed increases in precipitation

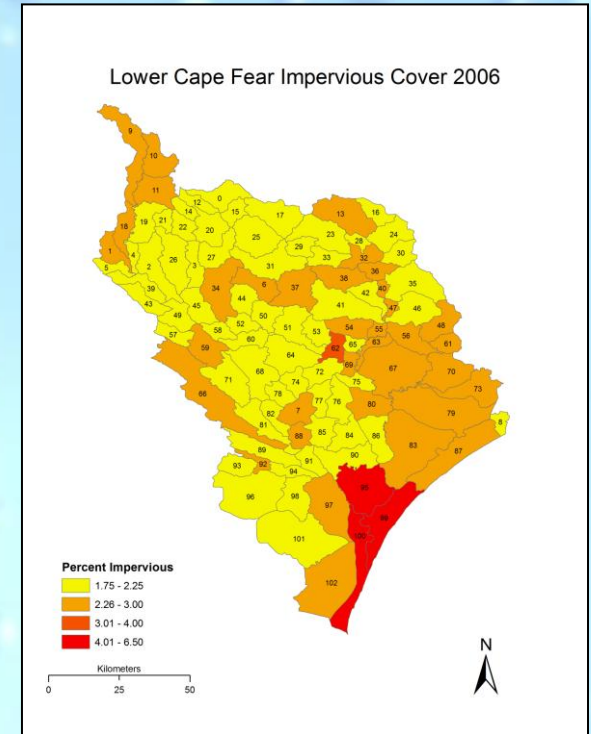
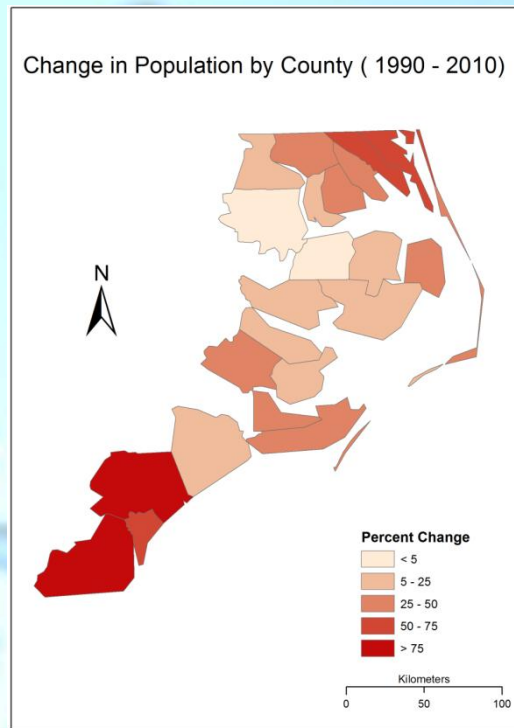
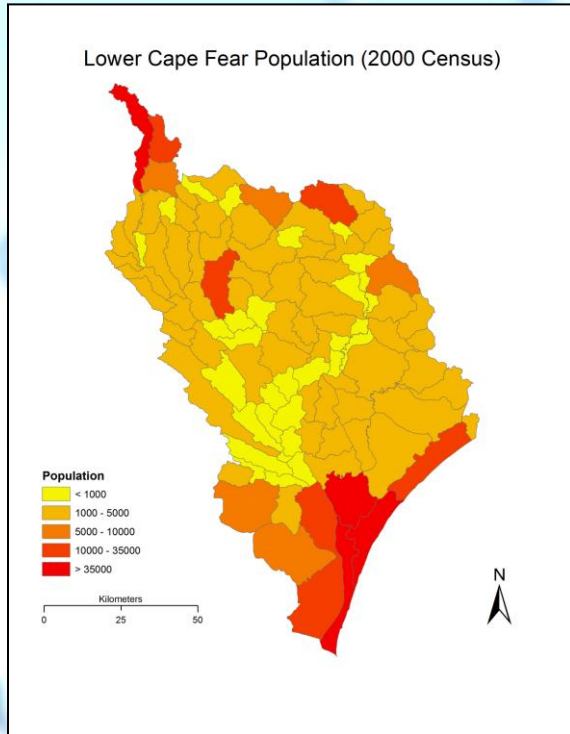


Population Impacts



(IPCC Fourth Assessment 2007)

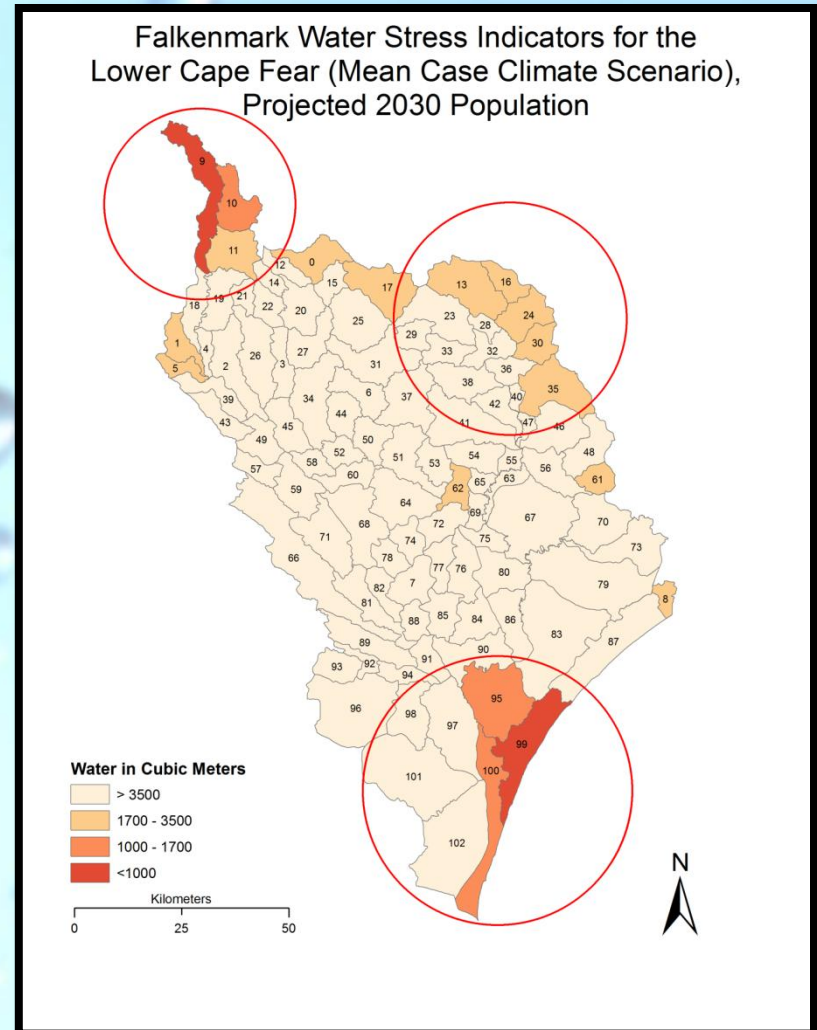
Population Growth



Population Growth (1989-2009)					
Location	1989	1999	2009	% Increase	Growth Rate (PPL per year)
New Hanover County	118,238	158,802	199,351	68.60%	4055.65
Brunswick County	50,182	71,787	108,419	116.05%	2911.85
North Carolina	6,568,810	7,948,901	9,397,397	43.06%	141429.35

Lower Cape Fear Stress Analysis

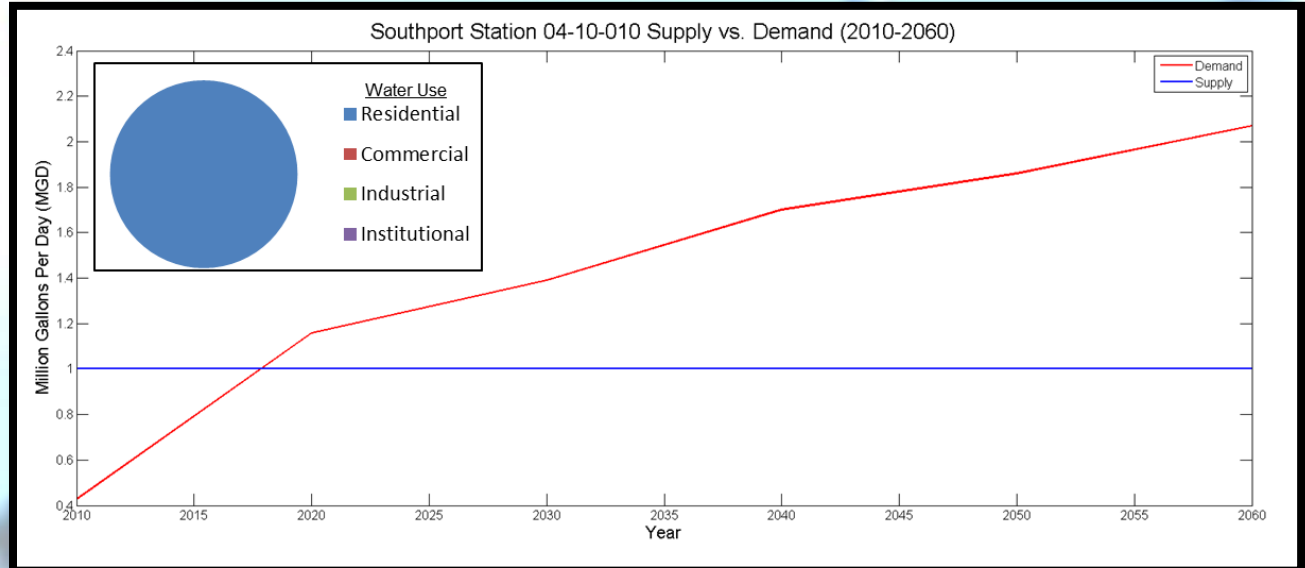
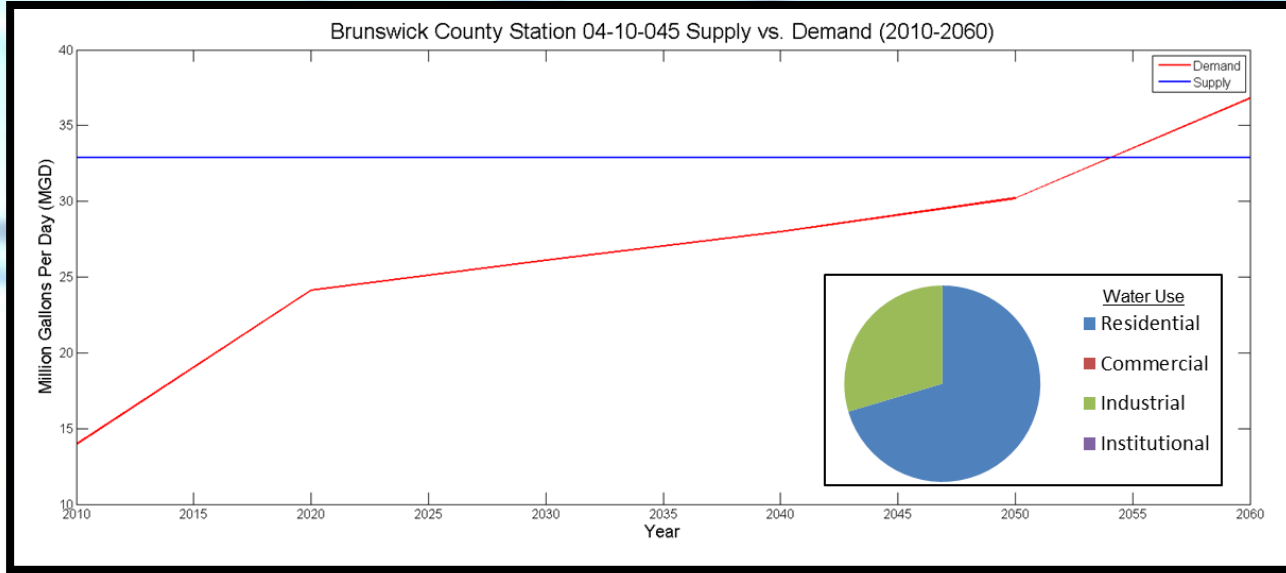
- Run under varying scenarios of climate, population, and impervious cover.
- Falkenmark indicators:
 - Stress = Below 1700 m³ per person per year
 - Scarce = Below 1000 m³ per person per year
- Three regions identified



Management Analysis

- Examine local water supply plans (NCDENR)
 - Identify at risk areas (i.e. demand surpassing supply)
 - Interview local water managers
 - Determine their management strategies
 - Understand how they plan to deal with shortages
- Review management options
 - Evaluate attitudes and opportunities for combined demand and supply management

Local Examples



Conclusions

- Water availability decreasing
- Demand increasing
- Increased stress and scarcity
- Need to explore management options to sustain future populations
- Need to consider demand management as well as supply management

Questions?

