

Alternative Normals – NC example

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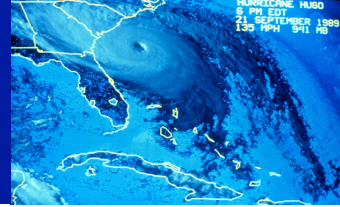
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** National Oceanic and Atmospheric Administration's National Climatic Data Center

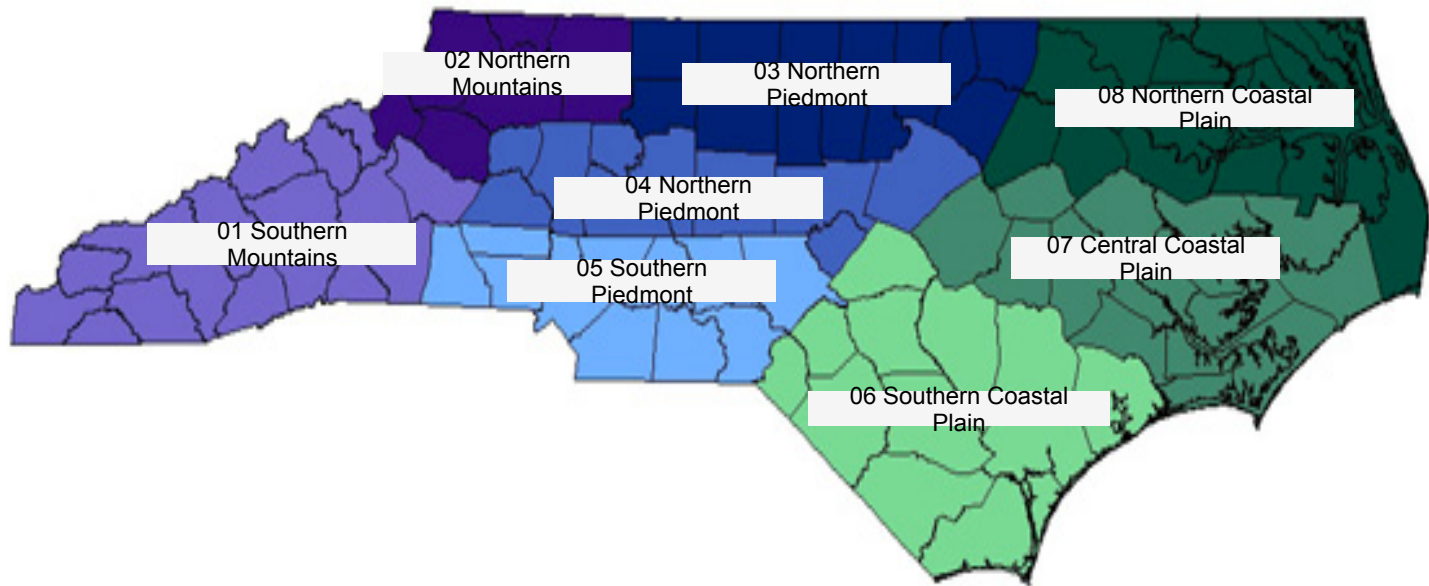
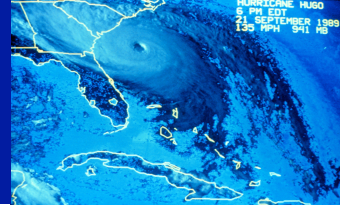


Methodology

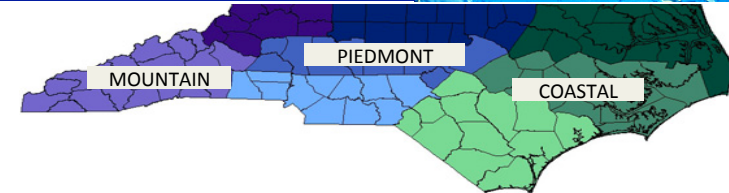
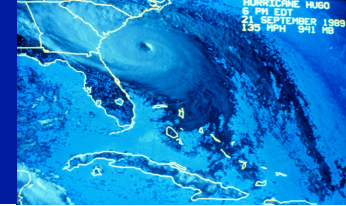


- Compute the average for the most recent N years
- Consider this as the predictor of the average of the coming M years
- Calculate the prediction “error”
- Repeat for all years of the period 1961-2010
- Average errors and find the value(s) of N that minimize the errors
- $M = 1$ year and $M = 5$ years
- $N = 1$ to 30 years
- Heating and Cooling Degree Days - NCDC

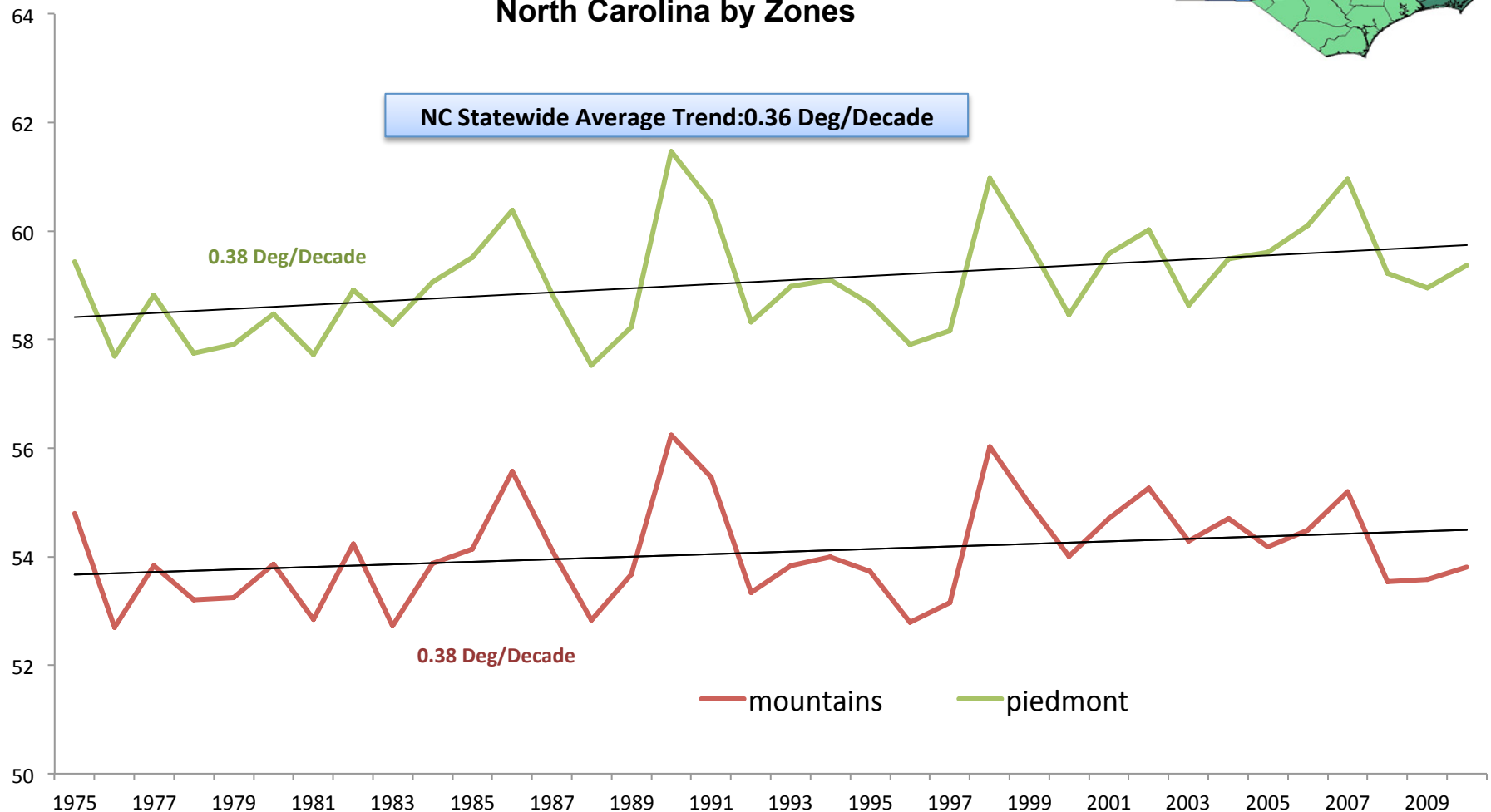
North Carolina: Climate Divisions



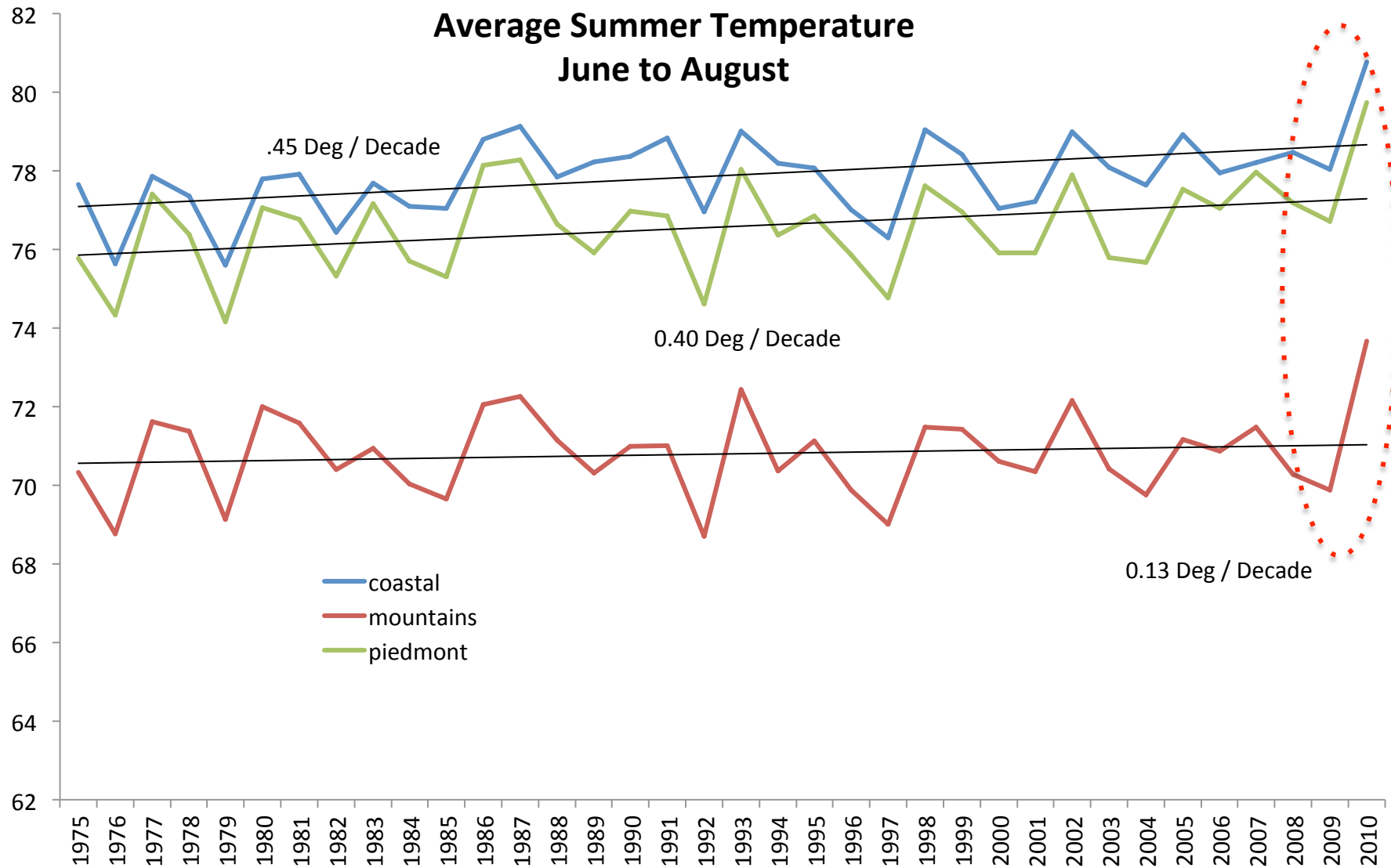
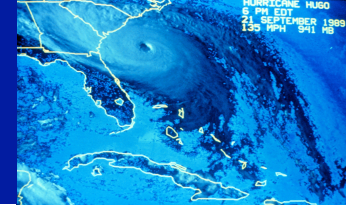
North Carolina: Temperature Trends since 1970s



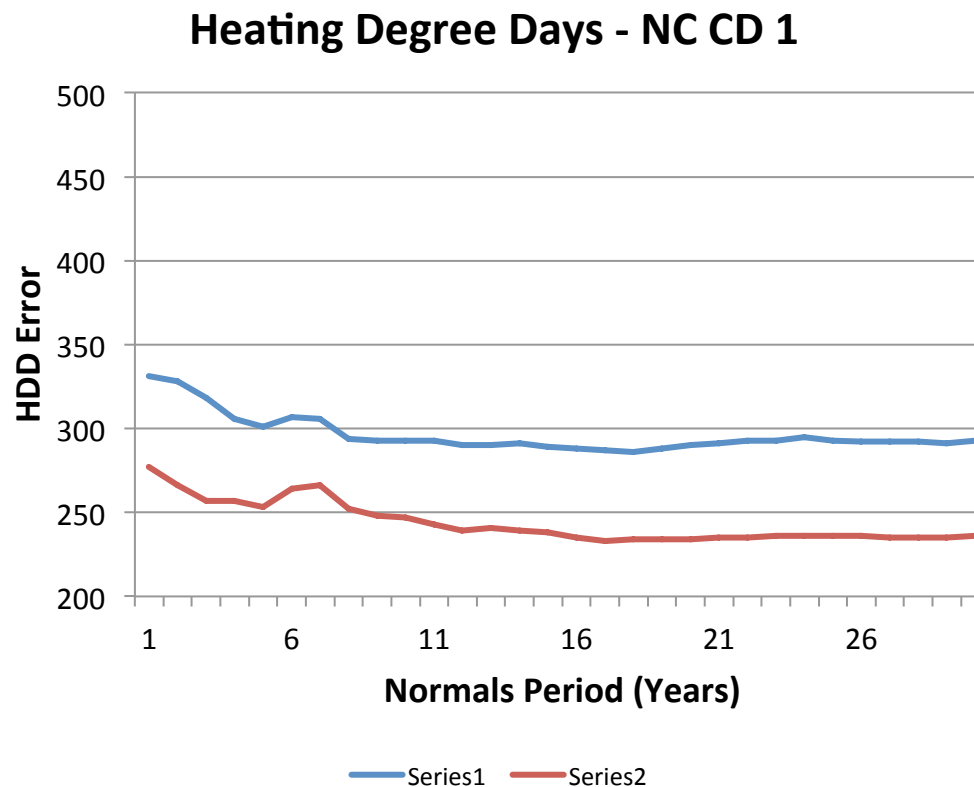
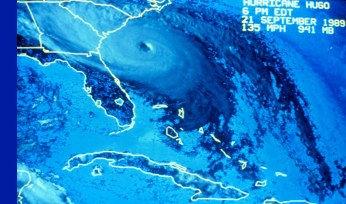
Annual Average Temperature
North Carolina by Zones



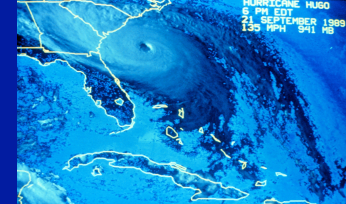
North Carolina: Temperature Trends since 1970s



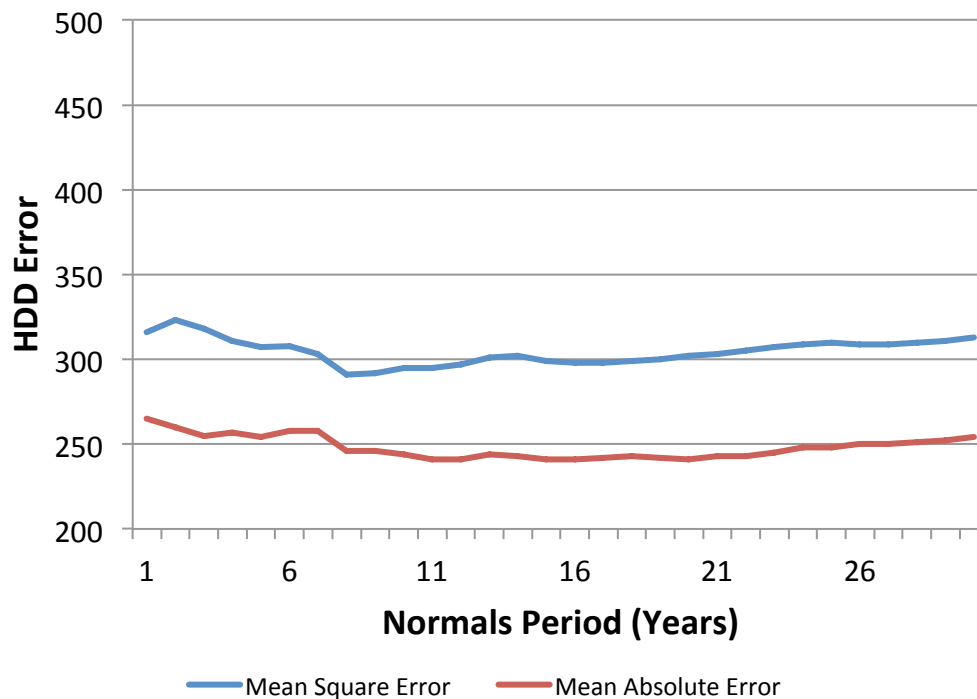
Mountains – 1 yr HDD



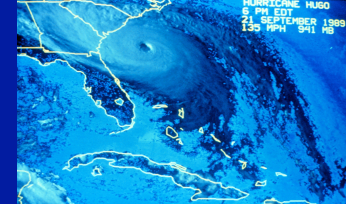
Piedmont – 1 yr HDD



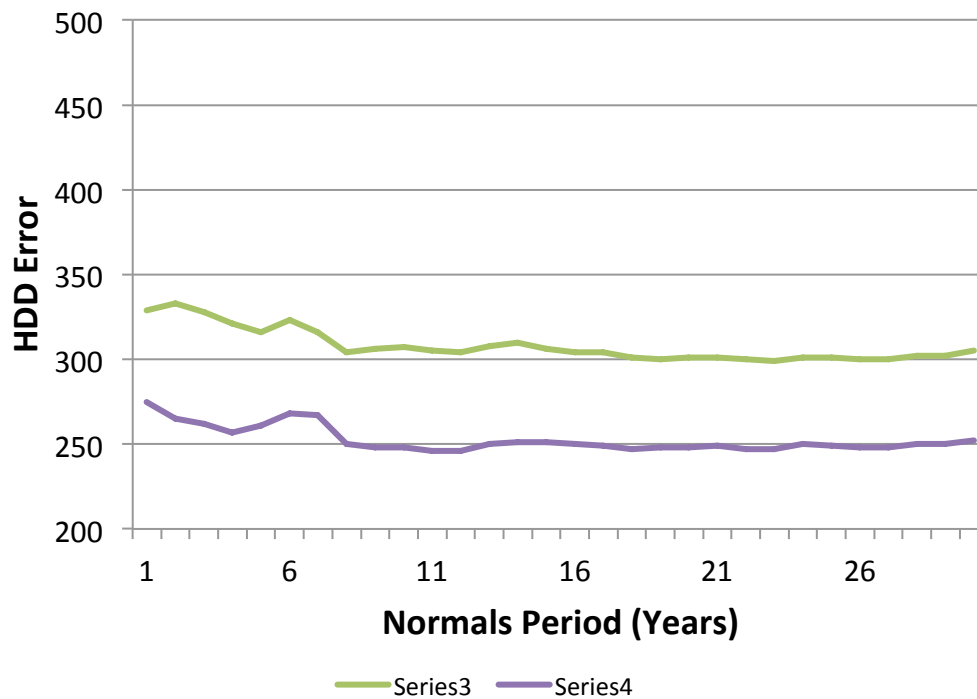
Heating Degree Days - NC CD 4



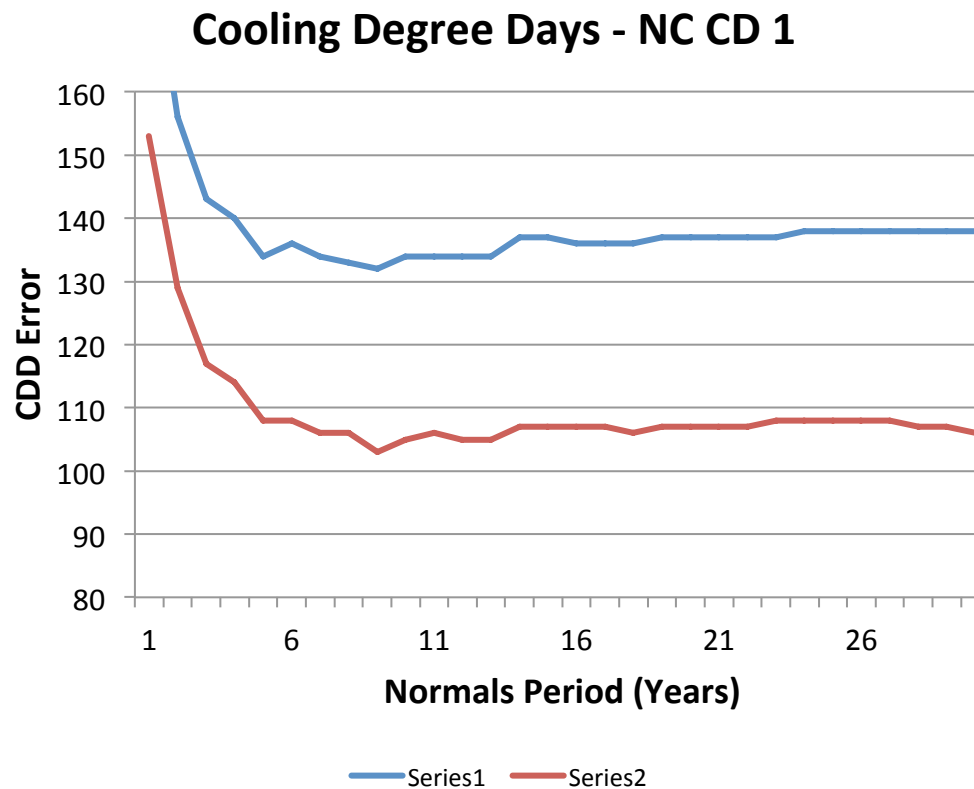
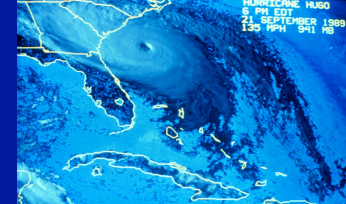
Coastal – 1 yr HDD



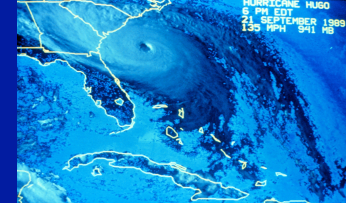
Heating Degree Days - NC CD 7



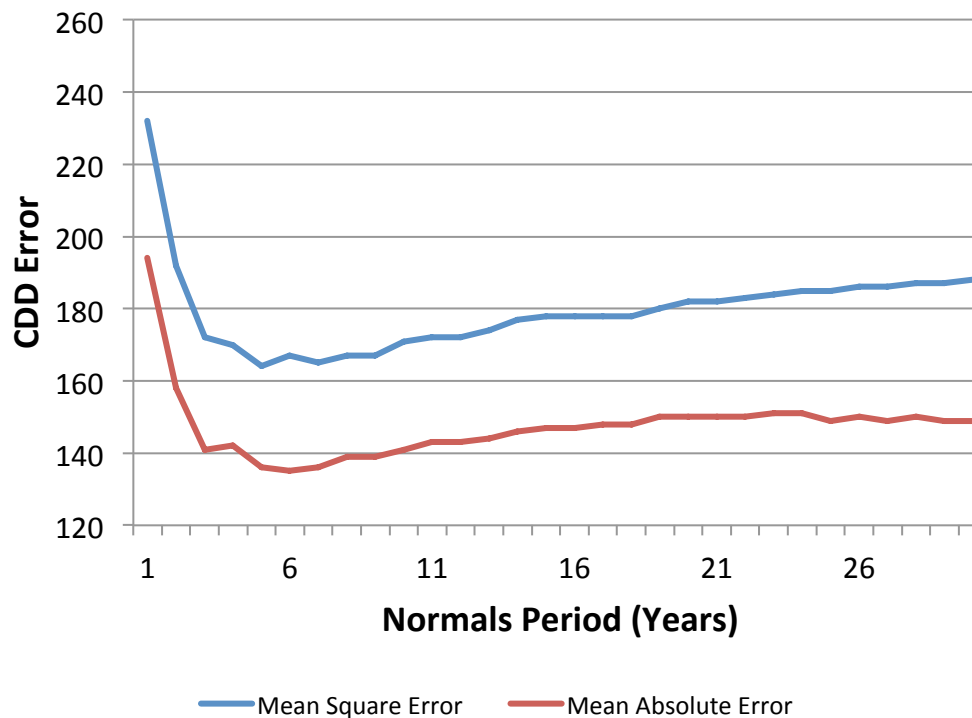
Mountains – 1 yr CDD



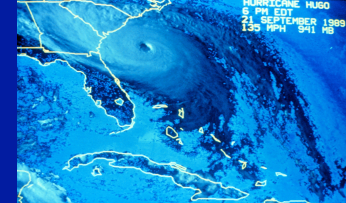
Piedmont – 1 yr CDD



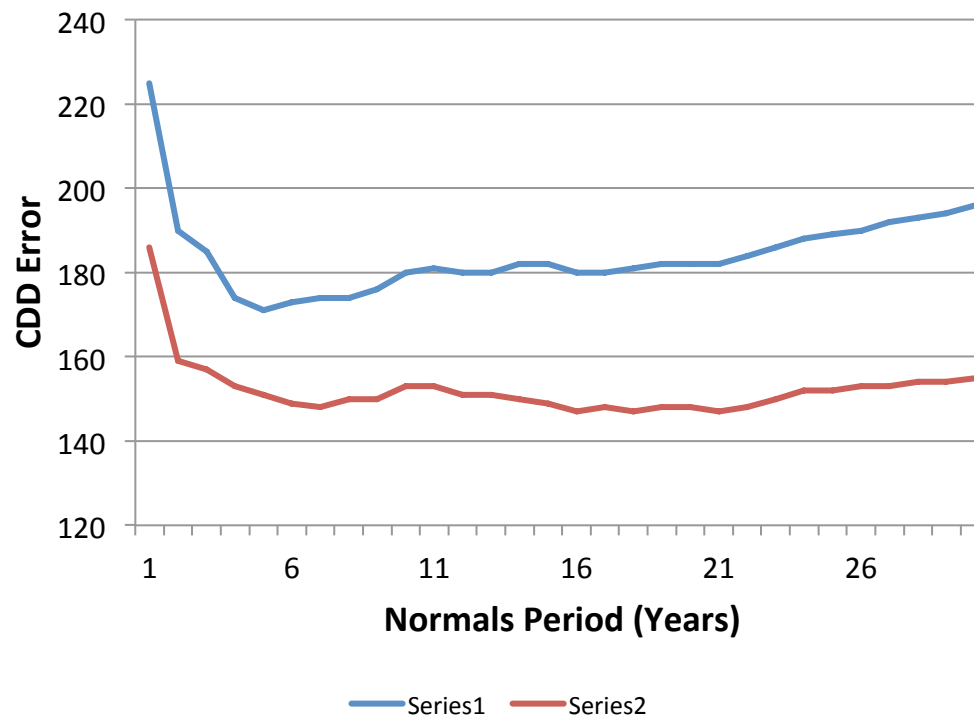
Cooling Degree Days - NC CD 4



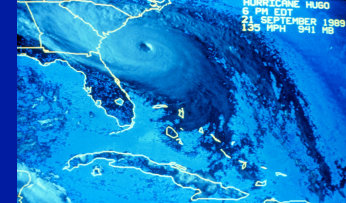
Coastal – 1 yr CDD



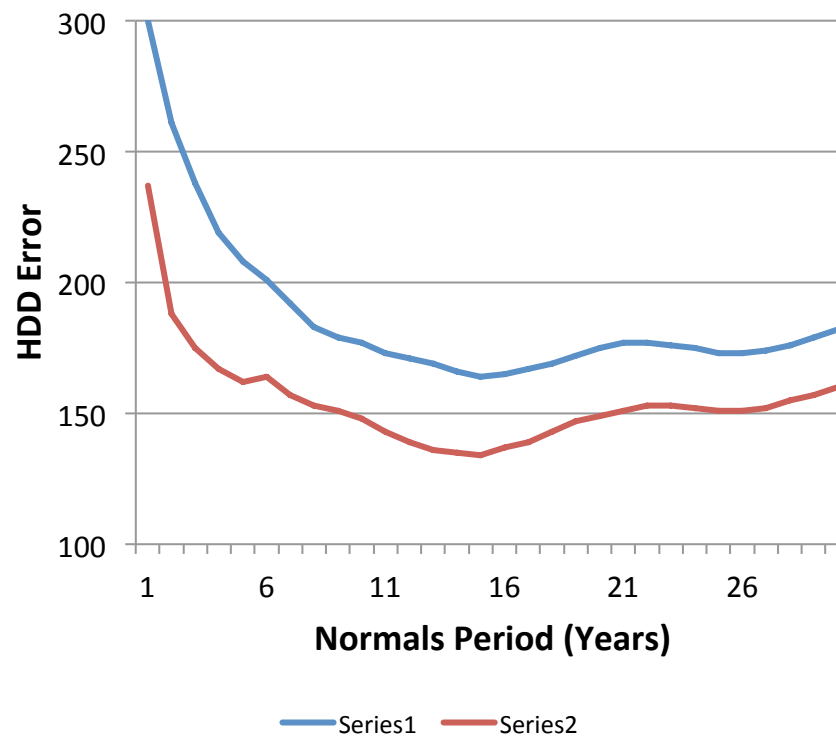
Cooling Degree Days - NC CD 7



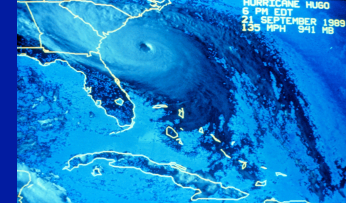
Mountains – 5 yr HDD



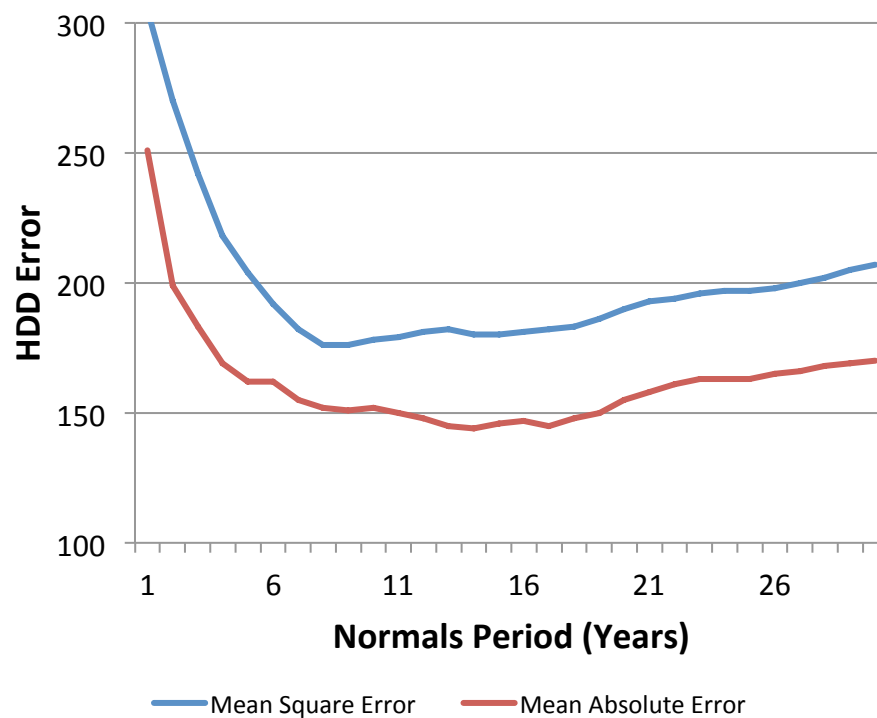
Heating Degree Days - NC CD 1



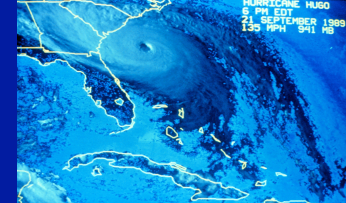
Piedmont – 5 yr HDD



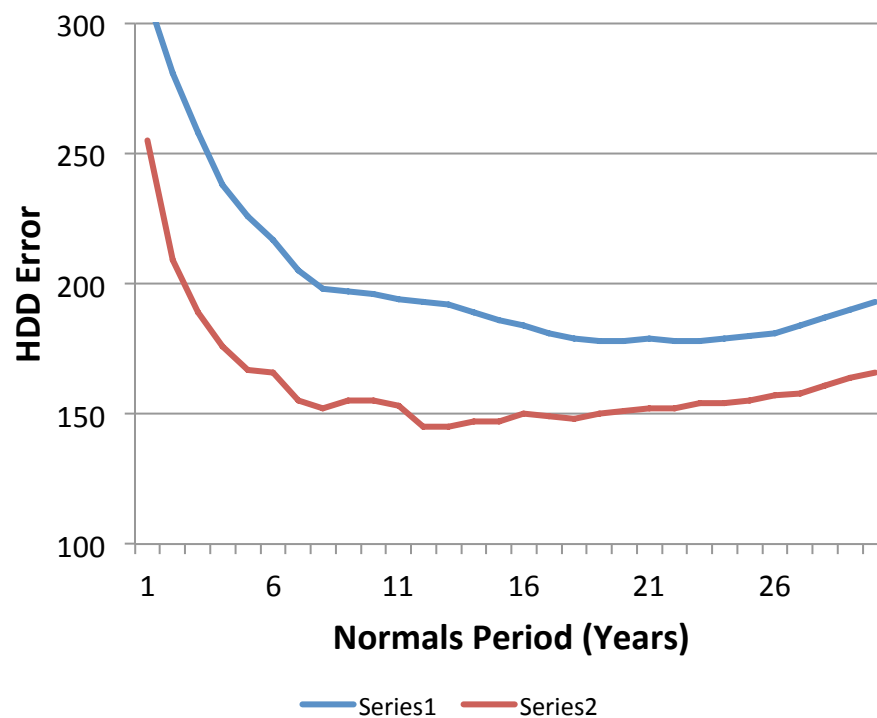
Heating Degree Days - NC CD 4



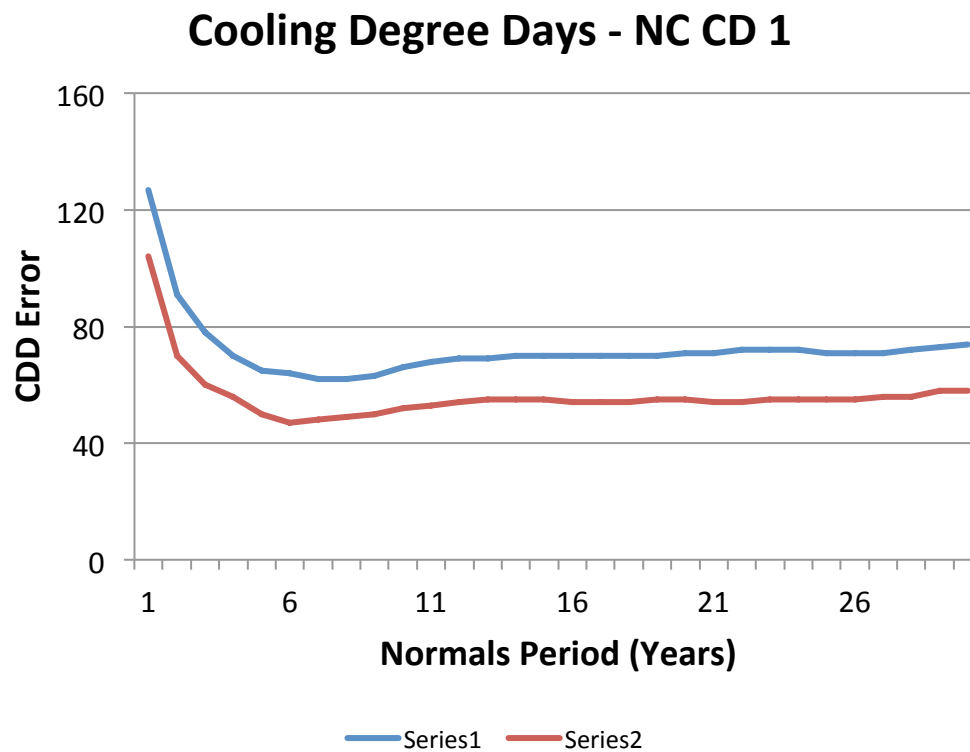
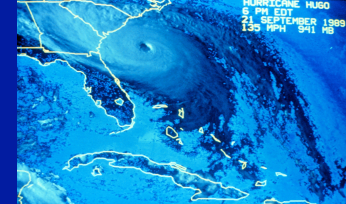
Coastal – 5 yr HDD



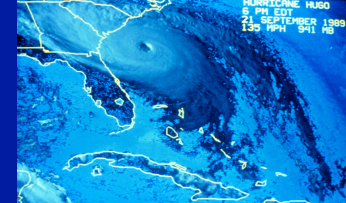
Heating Degree Days - NC CD 7



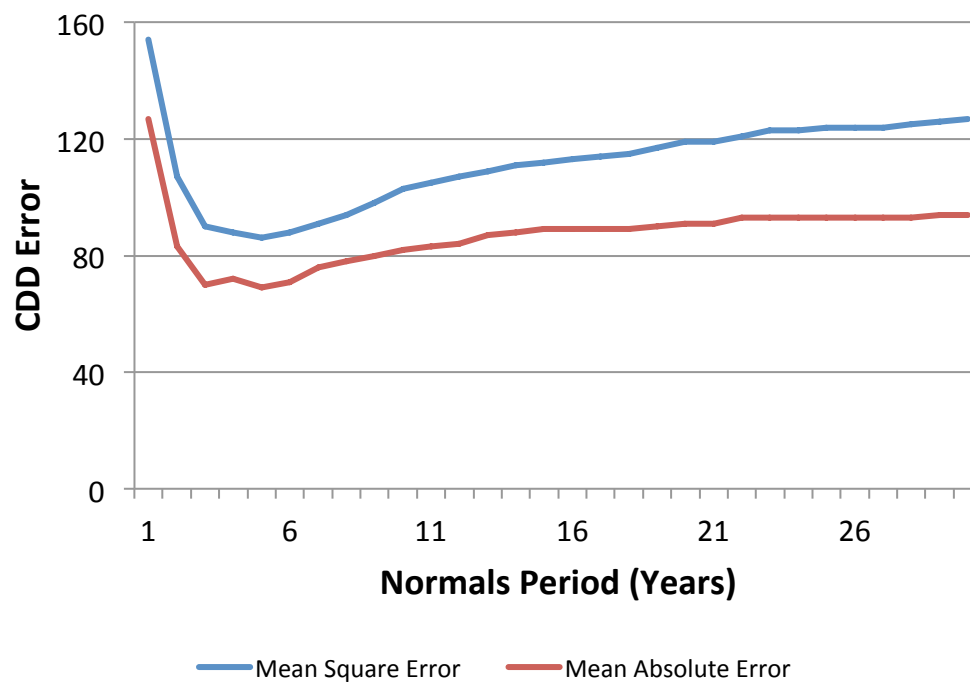
Mountains – 5 yr CDD



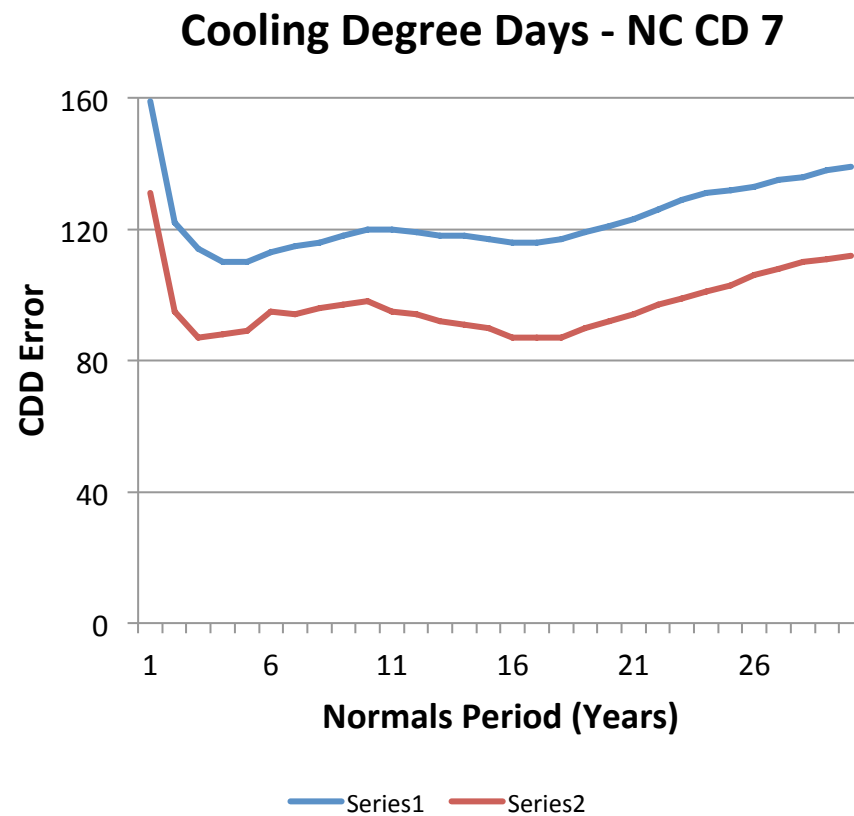
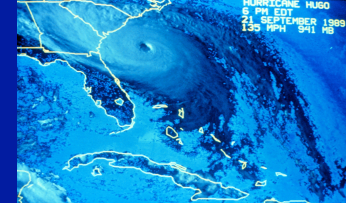
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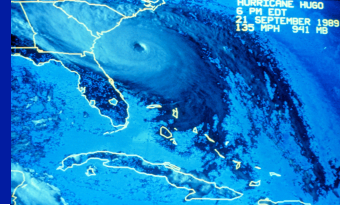
Cooling Degree Days - NC CD 4



Coastal – 5 yr CDD



Optimal Normals Periods



- Varies considerably by division and period of “prediction”
- For Cooling Degree Days, error is minimized for periods of 5-10 years
- For Heating Degree Days, the optimal period is longer, typically around 20 years
- Would this be meaningful to the load planners?
- Could optimal normals be used for load planning estimates?
- Could it drive different investment opportunities?
- What are the key areas to explore from a regulatory perspective?