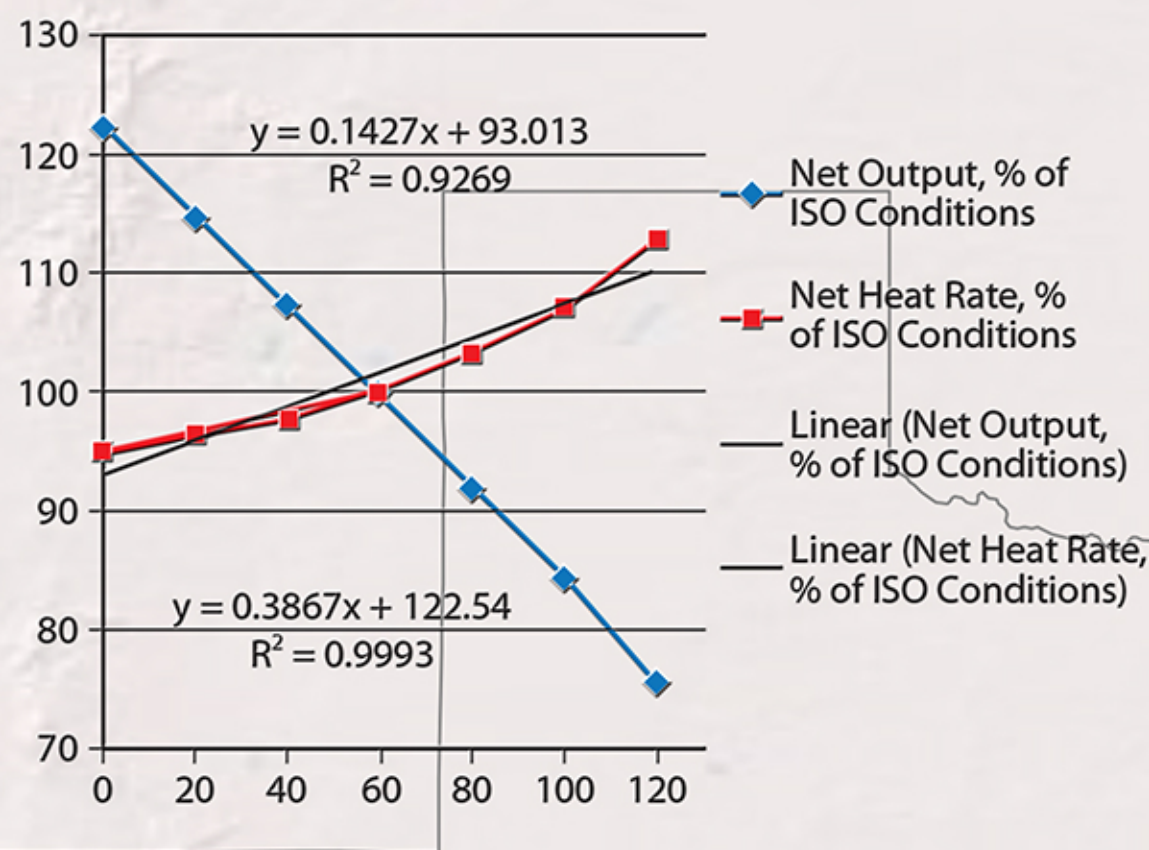
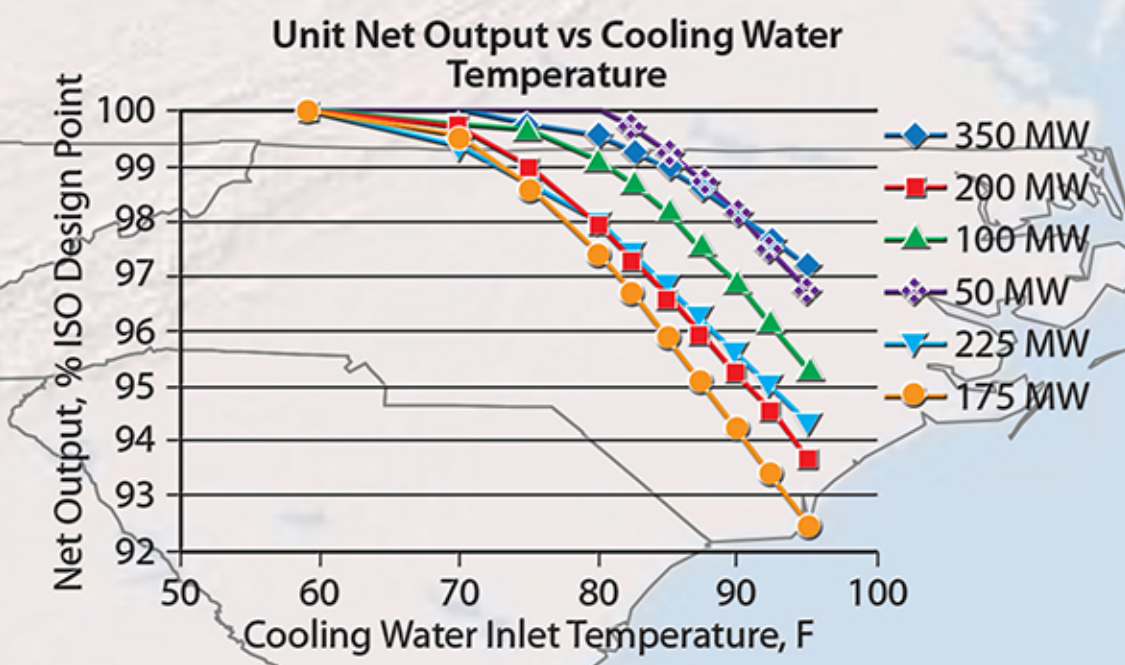


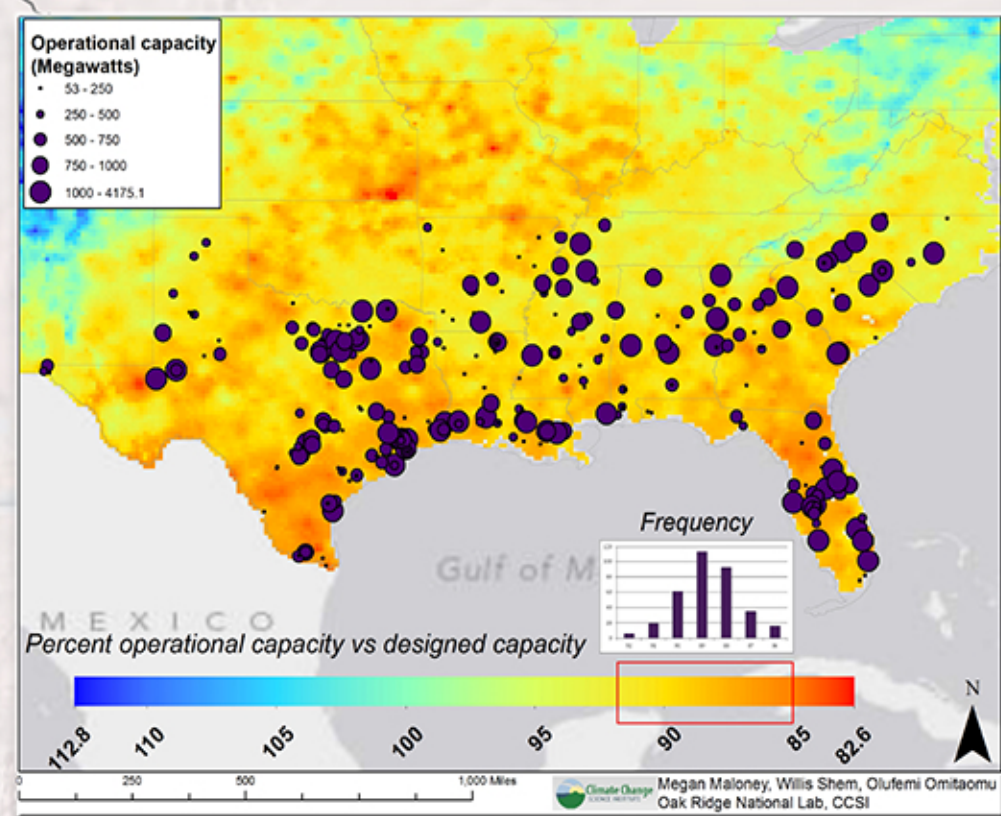
# Sensitivities of Electricity Generation Capacity to Climate Change Related Temperature Increases: A Regional Experiment



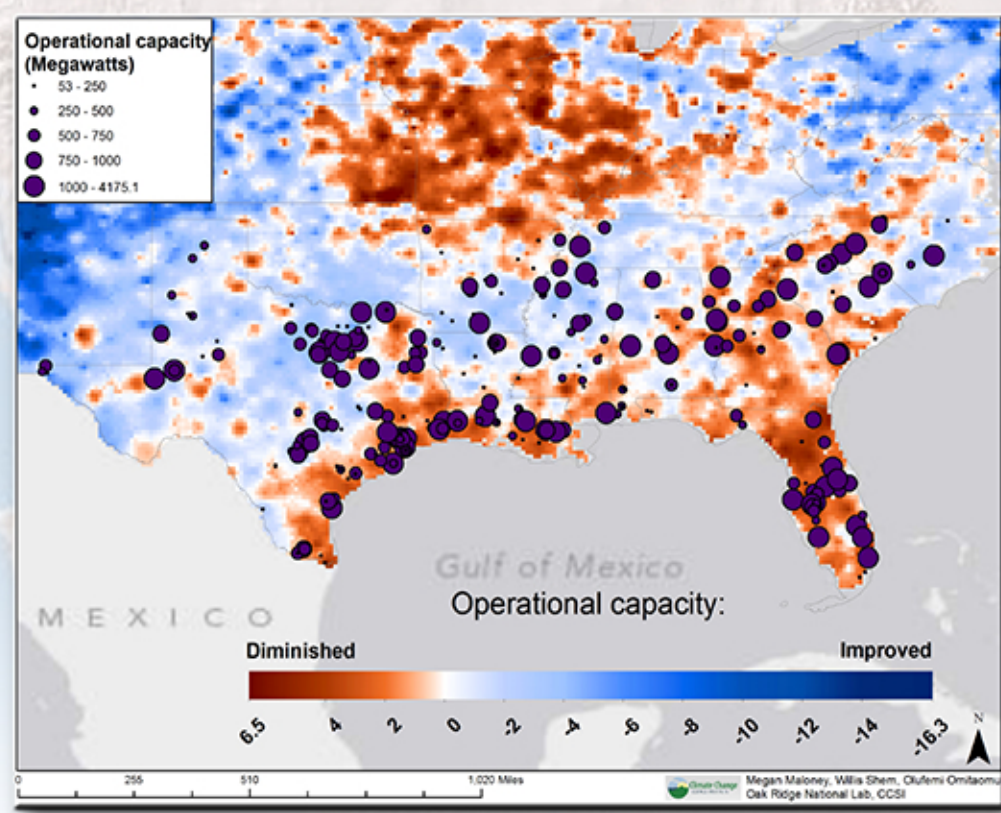
- Stimulated initially by the DOE IARP RIAM project
- In order to assess capacity reductions due to projected changes in regional temperature and precipitation in the US SE:
  - Combines a downscaled climate change scenario for this region with
  - The CIDM asset-specific geocoded data base on electric power plants and
  - Sensitivity curves describing relationships between thermal power plant capacity and air and water temperatures
- Has required adding considerable detail to the CIDM power plant data base



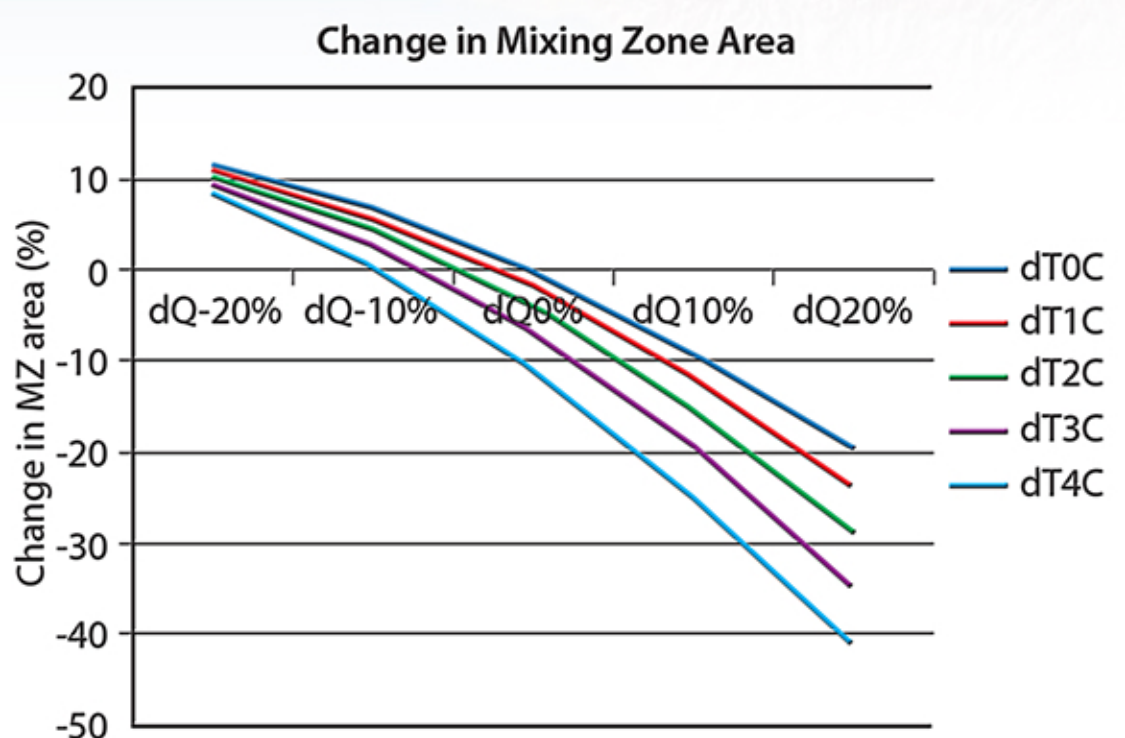
Se Electricity Producing Gas Fired Turbines, +50MW Capacity: Sensitivities Under July 12, 2050 Temperatures



Se Electricity Producing Gas Fired Turbines, +50MW Capacity: Difference in Performance Sensitivity to Temperature Between Present (1950-2000) Mean and July 12, 2050



- In the scenario used for the initial experiment (GFDC A2), average temperature changes in the SE over the period 2050 are less than 2°C – not a radical change
- Reductions in thermal power generation capacity, based on the current capital stock, would be relatively significant compared with design capacity (~10% in the summer, equivalent to a 6000 MWe outage for the 10-state region), but mixed compared with current capacities in the same season



The threat is from effects of serious seasonal droughts and heat waves on the temperature of the EPA-regulated “mixing zone,” where higher ambient water temperatures could lead to extensive power plant deratings over periods of weeks or longer

