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A high-resolution downscaled regional climate from NASA GISS AO model for the Southeastern United States

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Climate models and global reanalysis datasets have provided long term climate simulations and reanalysis of past, present, as well as projections for future climate change. The available IPCC AR4 climate assessments, even the already downscaled NARCCAP (The North American Regional Climate Change Assessment Program) are still at spatial scales that are too coarse for some of the decision making needs of the Gulf Coast. With the support from NASA, the IPCC present and projected climate from the NASA GISS AO model is downscaled to 30-km resolution covering the CONUS area and is further downscaled to 10-km resolution for the southeastern United States. While the downscaling methodology is studied and tested, the main objective of the project is to obtain downscaled high resolution climate for the forest modeling study over the southeast. The downscaling is carried out for the 1970~2070. Regional climate is then analyzed and summarized in this work. Present climate is compared to the observations and high resolution reanalysis, for example, North American Regional Reanalysis (NARR), in order for establishing the confidence level of the downscaled climate. The future climate is then compared to the current conditions to reveal changes in the regional climate, as well as the added high resolution value in the regional climate. The potential impacts and applications in forest health modeling will be presented in a companion work.