

**TITLE:** Simulated climate and climate change in the GFDL CM2.5 high-resolution coupled climate model

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**KEY FINDINGS:** A newly developed climate model with substantially higher spatial resolution significantly improves our ability to simulate regional climate, as well as climate variability and extremes.

**OVERVIEW OF THE RESEARCH:** A substantial multi-year effort took place to build a global coupled climate model with significantly higher spatial resolution than previous GFDL/NOAA climate models. This work built upon the highly successful GFDL CM2.1 climate model, as well as subsequent advances in numerical methods, physics, and computational resources. The result is a state of the art climate model with outstanding ability to simulate aspects of regional climate variability and change within a global model.

**RELEVANCE TO NOAA SCIENCE:** Such a new model significantly enhances NOAA's ability to make regional climate change predictions and projections on seasonal to decadal to centennial time scales, as well predictions and projections of changes in extreme weather.

**RELEVANCE TO SOCIETY:** This model will be able to provide significantly improved simulations of climate and climate extremes on regional spatial scales. This is crucial for many applications, since information on regional climate and changes in extremes is a key concern for many stakeholders.