

## Evaluation of Nesting and Boundary Strategies for Regional Climate Simulations

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FSU is an Applied Research Center (ARC) in support of the International Research Institute (IRI) for Climate Studies. One of our main missions is to evaluate the use of dynamical regional climate modeling for seasonal to interannual prediction. One of the more recent studies we have embarked on is examining the effectiveness of various approaches to regional modeling, particularly with regard to how the regional model is nested or coupled to the driving model and what are the consequences of using different domain sizes, physical parameterizations, etc. The FSU Nested Regional Spectral Model (FSUNRSM) shares much of the same dynamics and physical parameterization options with the FSU Global Spectral Model. This facilitates understanding the consequences of using different nesting strategies, using different physical schemes from the global and regional models, and so forth. With most other regional climate models, where the driving global model and regional model may differ greatly, it may be difficult to isolate the cause of the impacts of changing various configurations.

We present some preliminary results of examining the impact of using a wide range of nesting intervals (from every time step to one day), using differing domain sizes and resolution, using same and different physical parameterizations in the global/regional models, using different size relaxation zones (number of gridpoints of the regional model that are relaxed to the global solution), and other experimental configurations that may be performed by the time of presentation.

We hope that what we learn from these experiments will be useful for other regional climate groups in determining the most appropriate configuration for running their models as well as provide some basic understanding of the nature of nested regional climate modeling. We will look at the impact on seasonal time scales. We will also examine the impacts on the higher frequency events as well as the diurnal cycle. These first experiments will focus on Brazil and the Southeast U.S.