

Special Issue on  
**Regional Coupled Model and Data Assimilation**

# CALL FOR PAPERS

Recent studies of high-resolution observations and modeling have progressively promoted the understanding of climate sciences, especially those sciences related to mesoscale and submesoscale air-sea interactions. How atmospheric and oceanic processes interact across multiple scales is a long-lasting concern that can restrict the applicability of high-resolution observations. Yet societal needs require climate studies to better resolve and evaluate regional changes/variability as well as extreme events. There are currently two important scientific questions that require further study in the climate sciences: (1) how do global and large-scale fluctuations influence the local weather and climate anomalies? and (2) how do local weather-climate perturbations feedback large-scale phenomena? To address these questions, climate modeling must simultaneously resolve higher resolutions (which might be intractable with current computers) and local mesoscale and small-scale physical processes in increasingly greater details. Coupled general circulation models (CGCMs) can assess global change due to the changes of green-house gas and natural aerosols.

High-resolution regional models can be nested into a coarse resolution CGCM, efficiently achieving dynamically downscaled and optimized utilization of computational resources. Multiple nesting levels are often used to communicate between coarse and high-resolution models, and two-way nesting algorithms at high resolution boundaries have emerged. While such a framework efficiently advances our understanding of the attribution and impact of large-scale phenomena on local conditions, it also provides an opportunity to link scientific advances with severe weather alerts at the local level. We predict that regional coupled models with well-designed boundary processing and coupled data assimilation will progressively advance climate sciences and promote local societal services.

In this special issue, we call for papers that investigate recent advances in regional coupled modeling and data assimilation, regional weather-climate analysis and prediction, parameterization of atmospheric and oceanic processes at the mesoscale and submesoscale, assessment of regional observing system, regional model error correction, and parameter optimization.

Potential topics include but are not limited to the following:

- ▶ Regional ocean modeling and mesoscale to submesoscale oceanic physical processes
- ▶ Regional atmosphere modeling and cloud-resolving and microphysics expression
- ▶ Regional coupled modeling and mesoscale and small-scale air-sea interaction
- ▶ Development, implementation, and validation of regional land and soil model
- ▶ Regional coupling and boundary processing techniques
- ▶ Regional coupled model predictability and local weather-climate predictions
- ▶ Multiscale data assimilation applying to high resolution data assimilation
- ▶ Regional coupled data assimilation with boundary effects
- ▶ Tropical cyclone and squall forecast initialization
- ▶ Conventional (e.g., buoys and meteorological stations data) and unconventional (e.g., satellite and radar data) assimilation within a regional coupled model
- ▶ Regional land data assimilation and regional ecosystem data assimilation
- ▶ Regional observing system assessment
- ▶ Regional coupled model error studies and parameter correction

Authors can submit their manuscripts through the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/amete/rcmda/>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

**Lead Guest Editor**

Shaoqing Zhang, Ocean University of China, Qingdao, China  
*szhang@ouc.edu.cn*

**Guest Editors**

Yuanfu Xie, Earth System Research Laboratory, Boulder, USA  
*yuanfu.xie@noaa.gov*

Xiaohui Ma, Ocean University of China, Qingdao, China  
*maxiaohui@ouc.edu.cn*

Francois Counillon, Nansen Environmental and Remote Sensing Center, Bergen, Norway  
*francois.counillon@nersc.no*

Peng Yu, University of Maryland, College Park, USA  
*pengyu@gmail.com*

Zhao Jing, Texas A&M University, College Station, USA  
*jingzhao198763@email.tamu.edu*

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