

Oceanography & GFDI



Joint Colloquium

HIGH-RESOLUTION AIR-SEA COUPLING STUDIES

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**2:30 pm.
Friday
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**GFDI
Reading
Room**

**018 Keen
Bldg.**

Realistic high-resolution simulations designed to investigate the impact of two-way air-sea coupling on the Adriatic dynamics will be discussed. The COAMPS®/NCOM system consists of a triply nested data assimilating nonhydrostatic atmosphere model whose inner 4 km resolution nest communicates with a primitive equation ocean model of 2 km resolution. Simulations have been conducted for the Adriatic in fall 2002 when the ocean was typically 10°C warmer than the atmosphere and several high-wind "bora" events occurred.

An assessment of month-long Adriatic model results using remotely sensed and in situ measurements of ocean temperature along with over-water and coastal wind observations showed enhanced skill in the two-way coupled model relative to the one-way coupled model. In particular, the two-way coupled model produced spatially complex SSTs after a bora event that compared more favorably (using mean bias and rms error) with satellite MCSST, and had a comparatively stabilizing effect on the atmosphere. This led to reduced mixing in the atmospheric boundary layer and more realistic mean 10-m wind speeds in the two-way coupled simulation.

In related work, the impact of high resolution SSTs is investigated in research supporting the Department of Homeland Security Urban Dispersion Program (<http://urbandispersion.pnl.gov/>) focused on New York City. Using a 5-nest COAMPS system with highest resolution in the subkilometer range, local upwelling-induced SST variations are shown to influence the evolution of the atmospheric boundary layer.