Data Resources and Baseline Evaluation for Regional Ocean Data Assimilation

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Two elements, basic to the design, implementation, and evaluation of a regional ocean data assimilation (RODA) system, are (1) development of a data base for evaluation of the spatial structure of model variable increments and (2) baseline evaluation of the model running without direct data assimilation. These are now in place for the Coastal Ocean Forecast System (COFS) for the U. S. East Coast. A twelve-month data base has been developed, as well as the software for comparing model simulated temperatures with observing system reports and with the analyzed fields of sea Ocean Surface temperatures from NESDIS and FNMOC. [See Aikman III, et al (1996) for a description of the COFS.]

Results of the comparisons provide a baseline for future determination of the impact of data assimilation, as RODA is developed and implemented in a parallel version of COFS. Direct comparisons of sea Ocean Surface temperature (SST) values simulated by the model with buoy-observed SST values, have been made throughout a twelve month period for moored buoys in the Western Atlantic region of NCEP's COFS implementation. Time series plots of daily SST data, for buoy reports and COFS simulated values were made for all buoy locations. Examples are shown in Figures 1 and 2: the former showing good agreement between model and observations, and the latter indicating potential for significant improvement to be brought with assimilation of the data.

Monthly statistics of model-minus-observed SST differences, have been calculated for the twenty NDBC and AES buoys in the COFS region which reported from October 1995 through September 1996. Discrepancies between model and observed SST values vary with location and time-of-year, and show a strong annual cycle for some buoy sites. Monthly mean model-minus-observation differences range from -2.1 C to 11.5 C. Overall, the smallest discrepancies are during July and August; the largest discrepancies and the greatest positive model biases are in January and February.

Subsurface temperature comparisons have been made, using XBT soundings along the New York to Bermuda route of the ship Oleander, and coincident "soundings" of model temperatures. These comparisons will be also be used as baseline measures for determining the impact of data assimilation, as the methodology is developed and implemented.

Reference: Aikman, F. III, et al (1996) Towards an operational nowcast/forecast system for the U.S. East Coast. **Modern Approaches to Data Assimilation in Ocean Modeling.** Ed. P. Malanotte-Rizzoli, **Elsevier Oceanography Series, 61,** 347-376.

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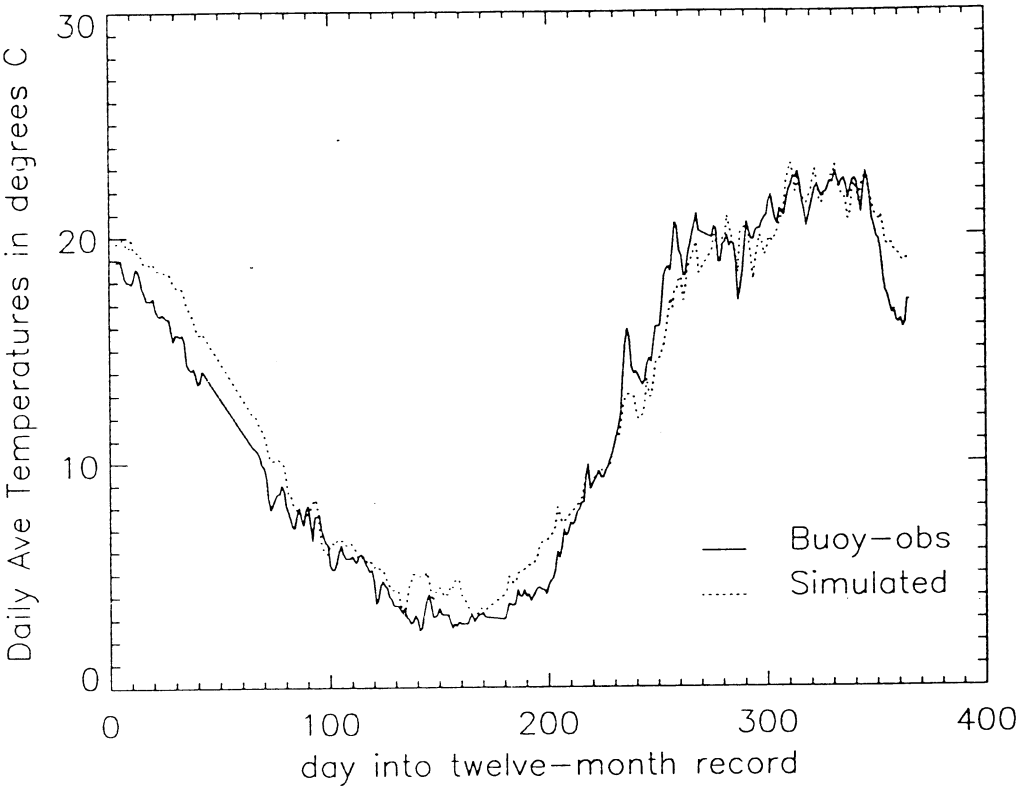

Fig. 1. Simulated and observed SST at Long Island, 10/95 - 9/96

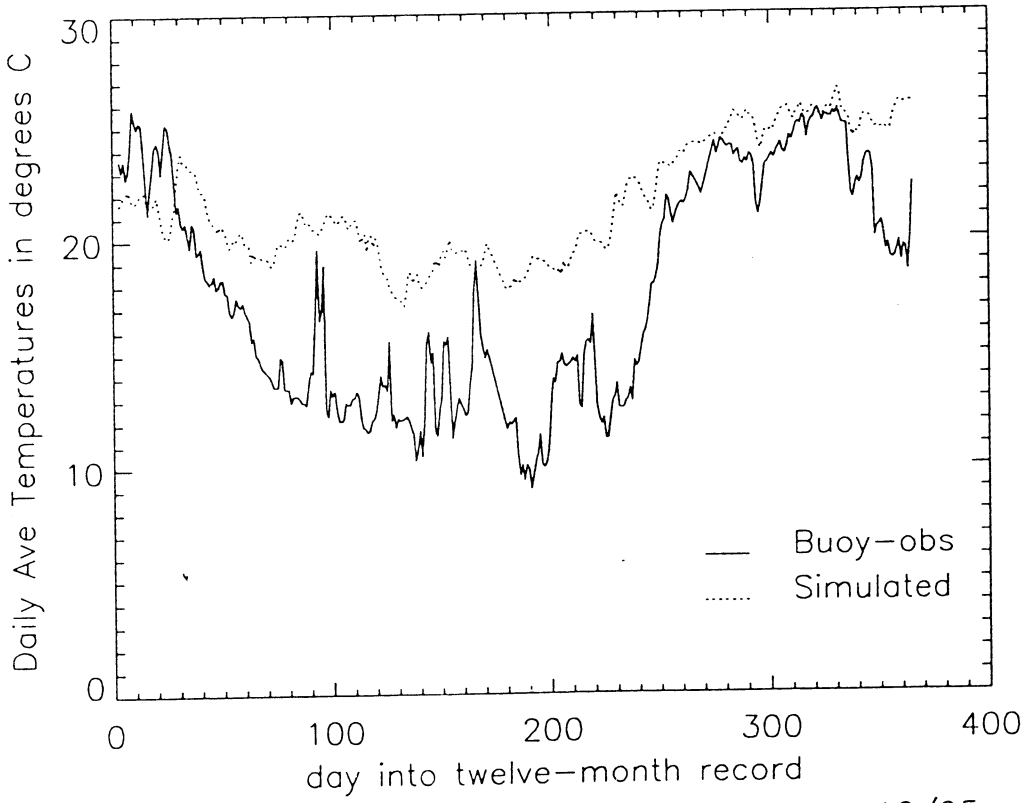

Fig. 2. COFS simulated and observed SST at Hotel, 10/95 - 9/96