

The RAP Seminar Series



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Development of holistic climate prediction systems: The South Asia-Bangladesh example

by

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Owing to the hypothesized limit to deterministic predictability (nominally 2 weeks), it has been traditional to break weather and climate predictions into distinct and separate categories. This has resulted in the confusion as to what is actually meant by "climate" predictions and has led to all but ignoring forecasts on the time scale of 10 days to 1 month. It has also raised artificial organizational barriers in research laboratories, modeling centers and prediction centers. But, decision makers do not understand such artificial distinctions between weather and climate. Further, decision makers particularly in water resource management, disaster management, and agriculture have a critical need for forecast information on this intermediate time scale of weeks to months.

We have made a first step towards a unified approach to providing predictions for decision makers over the continuum of time scales from weather to climate in our work with decision makers in the monsoon delta country of Bangladesh. We have developed a regional three-tier forecasting system for precipitation and river discharge for the Ganges and Brahmaputra. Forecasts are made for three time scales: seasonal (1-6 months), intraseasonal (20-30 days) and weather (1-10 days). The longest forecast (1-6 months: issued each month) provides a broad-brush regional outlook for the coming season. The intermediate forecast (20-30 days: issued every 5 days) provides a more detailed forecast on the sub-regional scale. The short-term forecast (1-10 days: issued daily) is the most accurate forecast for precipitation and river discharge. Ensemble simulations are used to prepare probabilistic forecasts that allow risk and cost-benefit analyses to be made relative to each time scale. All three time-scales are distributed to Bangladeshi government. We have been working with decision makers in Bangladesh to use these forecasts for disaster mitigation, optimization of agriculture (planting, harvesting, utilization of pesticides and fertilizers) and water resource management.

We believe that the three-tier forecasting system developed for Bangladesh and the experience in developing an end-to-end system is transferable to other regions. Given that upstream data from the Ganges or Brahmaputra was not available for our use or made available to the Bangladeshis we have had to make the assumption that these two river basins were essentially ungauged. This means that the schemes developed for Bangladesh may have a special applicability for regions that do not have established hydrological services or observation networks.

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