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OBJECTIVES

• To improve forecast skill and understanding on the sub-seasonal to seasonal timescale with special emphasis on high-impact weather events

• To promote the initiative’s uptake by operational centres and exploitation by the applications community

• To capitalize on the expertise of the weather and climate research communities to address issues of importance to the Global Framework for Climate Services

Sub-seasonal to Seasonal Prediction Initiative

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Probability of a tropical cyclone strike within 300 km for the week 3–9 October 2011, forecasted day 19–25, by the European Centre for Medium-Range Weather Forecasts. Super Typhoon Nalgae actually generated and aggravated the Thailand flooding.
BACKGROUND

Forecasting for the sub-seasonal time range has so far received much less attention than medium-range and seasonal prediction, as it has long been considered a “predictability desert”. Recent research has indicated important potential sources of predictability through better representation of atmospheric phenomena such as the Madden–Julian Oscillation and improved coupling with, and initialization of, the land–ocean–cryosphere and stratosphere.

From the end-user perspective, the sub-seasonal to seasonal time range is a very important one, as many management decisions in agriculture and food security, water, disaster risk reduction and health fall into this range.

Better understanding of these potential sources of predictability together with improvements in model development, data assimilation and computing resources should result in more accurate forecasts.

RESEARCH PRIORITIES

The sub-seasonal to seasonal prediction initiative will involve the following:

- Evaluating the potential predictability of sub-seasonal events, including identifying windows of opportunity for increased forecast skill, with special emphasis on high-impact weather events
- Understanding systematic errors and biases in the sub-seasonal to seasonal forecast range
- Comparing, verifying and testing multi-model combinations from these forecasts and quantifying their uncertainty
- Focusing on some specific extreme event case studies, such as the Russian heatwave of 2010, the floods in Pakistan in 2010 and Australia in 2011, and the European cold spell of 2012

IMPLEMENTATION

The proposed WWRP/THORPEX–WCRP joint research project to improve forecast skill and understanding on the sub-seasonal to seasonal timescale will require the following:

- The establishment of a project office and a steering group
- The establishment of a multi-model database consisting of ensembles of sub-seasonal (up to 60 days) forecasts and supplemented with an extensive set of re-forecasts following THORPEX Interactive Grand Global Ensemble protocols
- A series of dedicated science workshops on sub-seasonal to seasonal prediction, starting with “Sources of predictability at the sub-seasonal timescale – windows of opportunity for applications”
- Appropriate demonstration projects based on some recent extreme events and their impacts, in conjunction with the WWRP Working Group on Societal and Economic Research and Applications

This challenging project will require five years, after which the opportunity for a five-year extension will be considered.