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What did we learn from the S2S database?

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The S2S database, a key component of the World Weather Research Programme (WWRP)/World Climate Research Programme (WCRP) Sub-seasonal to Seasonal Prediction Project science plan, opened to the public in 2015. It contains sub-seasonal (up to 60 days) forecasts, 3 weeks behind real time, and reforecasts from 11 operational centres, modelled in part on The Observing System Research and Predictability Experiment (THORPEX) Interactive Grand Global Ensemble (TIGGE) database for medium-range forecasts (up to 15 days). It is hosted at ECMWF, CMA and IRI. In this talk, the main lessons learned during the development of the database and future developments will be discussed.

The S2S database represents an important tool to advance our understanding of the sub-seasonal to seasonal time range that has been considered for a long time as a "desert of predictability". More than 70 articles based on the database have been published so far in the peer-reviewed literature. They provide an extensive assessment and model inter-comparison of the skill of state-of-the-art S2S models to predict a wide range of parameters, including sea-ice cover, the Madden-Julian Oscillation and Sudden Stratospheric Warmings. Other scientific questions which have been investigated include:
• What is the importance of multi-model forecast for sub-seasonal to seasonal prediction?
• What is the predictability of extreme events and how can we identify windows of opportunity for sub-seasonal to seasonal prediction?
• What is the impact of atmospheric horizontal and vertical resolution on sub-seasonal to seasonal forecasts?
• How are state-of-the-art models representing tropical-extra-tropical and stratosphere-troposphere teleconnections?
• What are current S2S forecasting capabilities for daily weather characteristics relevant to agriculture, water resource management and public health, such as heavy rainfall events, dry spells and monsoon onset/cessation dates?

This talk will review some of the key results obtained from the S2S database.

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