Project

A WWRP/THORPEX-WCRP joint research project has been established to improve forecast skill and understanding on the subseasonal to seasonal timescale, and promote its uptake by operational centres and exploitation by the applications community. Specific attention will be paid to the risk of extreme weather, including tropical cyclones, droughts, floods, heat waves and the waxing and waning of monsoon precipitation. To achieve many of these goals the establishment of an extensive data base of subseasonal (up to 60 days) forecasts and reforecasts (sometimes known as hindcasts) has been advocated, modelled in part on the THORPEX Interactive Grand Global Ensemble (TIGGE) database for medium range forecasts (up to 15 days) and the Climate-System Historical Forecast project (CHFP) for seasonal forecasts. Developing an extensive data base for the subseasonal time scale will be a challenging task since consensus still needs to be reached on how to produce these forecasts (start dates, length of the forecasts, averaging periods, update frequency of the forecasts). For NWP forecasts, model error is not usually so dominant that a reforecast set is needed but for the subseasonal to seasonal range model error is too large to be ignored. Therefore an extensive reforecast set spanning several years is needed to calculate model bias, which in some cases can also be used to evaluate skill.

Careful calibration and judicious combination of ensembles of forecasts from different models into a larger ensemble can give higher skill than that from any single model. Comparing, verifying and testing multi-model combinations from these forecasts, quantifying their uncertainty as well as the handling of such a massive dataset will nevertheless be challenging.

An important aspect will be to promote use of these forecasts and their uncertainty estimates by the applications community. The project will focus on some specific case studies, such as the Russian heat wave of 2010, the Pakistan floods in 2010, Australian floods of 2011, European cold spell in 2012, as demonstration projects. These examples can also provide the basis to better quantify benefits through links with the WWRP Societal and Economic Research and Applications (SERA) working group and relevant WCRP activities. Truly actionable science for a wide range of decision makers will require inter-disciplinary researchers engaged in developing risk-management strategies and tools for establishing climate services. Extensive multi-model reforecast sets will also be needed to build statistical models which are used to tailor climate forecasts for use in sector- specific applications on the seasonal scale.

Open access to forecast data and user-friendly data bases are important requirements for broad community uptake. The data base will underpin the research that can shape the scope of developing operational products to be provided by the WMO Global Producing Centres and eventually to serve real time forecasts via the WMO Lead Centres for Long Range Forecast Multi Model Ensembles as coordinated by CBS.

 The proposed WWRP/THORPEX-WCRP joint research project to improve forecast skill and understanding on the subseasonal to seasonal timescale will include:

- The establishment of a multi-model data base consisting of ensembles of subseasonal (up to 60 days) forecasts and supplemented with an extensive set of reforecasts following TIGGE protocols. A workshop will be necessary to address technical issues related to the data base;
- A major research activity on evaluating the potential predictability of subseasonal events, including identifying windows of opportunity for increased forecast skill with a special emphasis on events that have high societal or economic impacts. Attention will also be given to the prediction of intraseasonal characteristics of the rainy season that are relevant to agriculture and food security in developing countries.
- A series of science workshops on subseasonal to seasonal prediction.
- Appropriate demonstration projects based on some recent extreme events and their impacts, in conjunction with the WWRP SERA

This project will last 5 years (starting in January 2013), after which the opportunity for a 5 year extension will be considered. A project office will be established soon.

Assignee

S2S project leaders:

- Frédéric Vitart (ECMWF)
- Andrew Robertson (IRI)

S2S archive

The idea to produce an archive of sub-seasonal forecasts following the same protocole as TIGGE. So far 11 participants have expressed interest in this project.

ECMWF assignee

Accountable for S2S project: Frédéric Vitart

Participants on S2S archive:

- Manuel Fuentes (technical lead)
- Richard Mladek (data processing)
- Ioannis Mallas (data acquisition)