GEOWOW - Benefits of TIGGE ensemble forecast data for the GEOSS community

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GEOWOW (GEOSS interoperability for Weather, Ocean and Water) is an EU-funded project with the main challenge to improve Earth Observation data discovery, accessibility and exploitability, and to evolve the Global Earth Observation System of Systems (GEOSS) for the benefit of all Societal Benefit Areas (SBAs) with focus on Weather, Ocean Ecosystems and Water. There is a particular focus on supporting multi-disciplinary interoperability across different SBAs, including the use of weather forecast ensembles in applications.

The weather community in GEOWOW, led by ECMWF, addresses the elements of the GEO Capacity Building Strategy by improving the access to TIGGE (THORPEX Interactive Grand Global Ensemble) data in which global ensemble predictions from 10 leading global NWP centres are collected in near real-time to support research on ensemble prediction. GEOWOW extends the TIGGE archive with ensemble weather forecasts from limited area models and will build a multi-model ensemble time-series archive (Global and LAM containing data only for specific points) to increase the accessibility of TIGGE for a wider community.

GEOWOW work also includes the development and demonstration of (multi-model) products using TIGGE data to support high impact weather forecasting in areas such as tropical cyclone tracks, heavy precipitation events and strong winds. Testing and delivery of these products is in collaboration with participants in the WMO Severe Weather Forecasting Demonstration Project (SWFDP). The SWFDP is a WMO capacity building project which uses a Cascading Forecasting Process to support a basic capability to issue severe weather warnings in developing and least-developed countries.

A specific area of work covers the demonstration and documentation of the potential use of TIGGE data in high impact weather forecasting through mainly case studies. Analysed cases include various types of severe weather and different regions – for example rainfall and flooding in West & East Africa and tropical cyclones. The approach shown here is based on a two-step process (EOF analysis followed by Fuzzy clustering) which provides clusters to highlight main characteristics & development of the various relevant weather scenarios.

An important area where GEOWOW contributes to multi-disciplinary developments is the Weather/Water application of modeling river discharge based on the atmospheric input from TIGGE models. The river discharge ensemble forecasts are produced globally with the HTESSEL land-surface model (operationally used at ECMWF) coupled with CaMa-Flood river routing to integrate runoff over large river catchments. Expected benefits are the improved interoperability of domain resources through the GEOSS Common Infrastructure.

The poster will cover all important weather related developments carried out in GEOWOW with particular focus on the hydrological application of river discharge modeling.