



TIGGE, TIGGE LAM and the GIFS

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To accelerate improvements in high-impact weather forecasts, the WMO established the Observing System Research and Predictability Experiment (THORPEX) Interactive Grand Global Ensemble (TIGGE) program coordinated by the GIFS-TIGGE working group. The TIGGE objectives are to promote ensemble forecast research, develop products that have societal benefit, and prototype a future Global Interactive Forecasting System (GIFS). A TIGGE-LAM Panel was set up to coordinate the contribution from LAM EPS and to evaluate if and how predictability of high-impact weather events can be improved by LAM EPS.

A phased approach was chosen beginning with mirrored data collections of global medium-range ensemble forecasts from 10 NWP providers at three TIGGE Archive Centres: CMA, ECMWF, and NCAR. The TIGGE Archives have great value for the users, because standards for data format, parameter fields, and transfer protocols were internationally agreed upon at the start. The ICT systems run 24x7, collecting data from the providers, validating the data integrity and completeness, and supporting user access. Currently, the TIGGE archive is growing with more than over 1.7 M fields and 500 GB per day. User activity continues to improve. Currently approximately 50 active users (submitting multiple requests) trigger data processing on 15 TB and download 1 TB monthly. Fast user access to the complete archive, now 425 TB, is a technical challenge. Delivery systems at ECMWF are fairly well suited to this challenge, while NCAR has found it necessary to place more data online and boost server side computational power. A new validation data portal is being designed and will be coupled to the TIGGE access portal at NCAR. Having the forecast fields and observations available from the same interface will further support the TIGGE program objectives.

Once the TIGGE dataset was established, focus shifted to the use of ensemble forecasts for research and to the development of the GIFS. A step-by-step approach to the development of GIFS has been adopted, with the first step being focused on tropical cyclone prediction to be followed by heavy rainfall products and near surface wind. GIFS will be based on (1) real time access to ensemble forecast data; (2) statistical post-processing and combination of such data from several ensemble providers; and (3) generation of products and services for WMO nations in particular in developing regions. Products will be generated and distributed using a global to regional to national cascade, as successfully demonstrated by the WMO/CBS Severe Weather Forecast Demonstration Project (SWFDP). GIFS will be closely coordinated with the SWFDP, and with other WMO projects and working groups, in order to develop prototype GIFS products and assess their benefit through a testing and evaluation period. Products based on LAM EPS systems, where available, will supplement products available from the global TIGGE data, and demonstrate the additional benefit obtainable from higher resolution ensembles. The concept of relocatable LAM EPS systems will also be considered as a possible future adaptive component of GIFS. The GIFS system will follow CBS guidelines on operational systems and requirements, using the WIS infrastructure. Subject to positive scientific results, data policy agreements and future additional investment, GIFS could form the basis of a future operational global forecasting system.