



**THORPEX**  
A World Weather Research Programme



**WWRP-THORPEX**

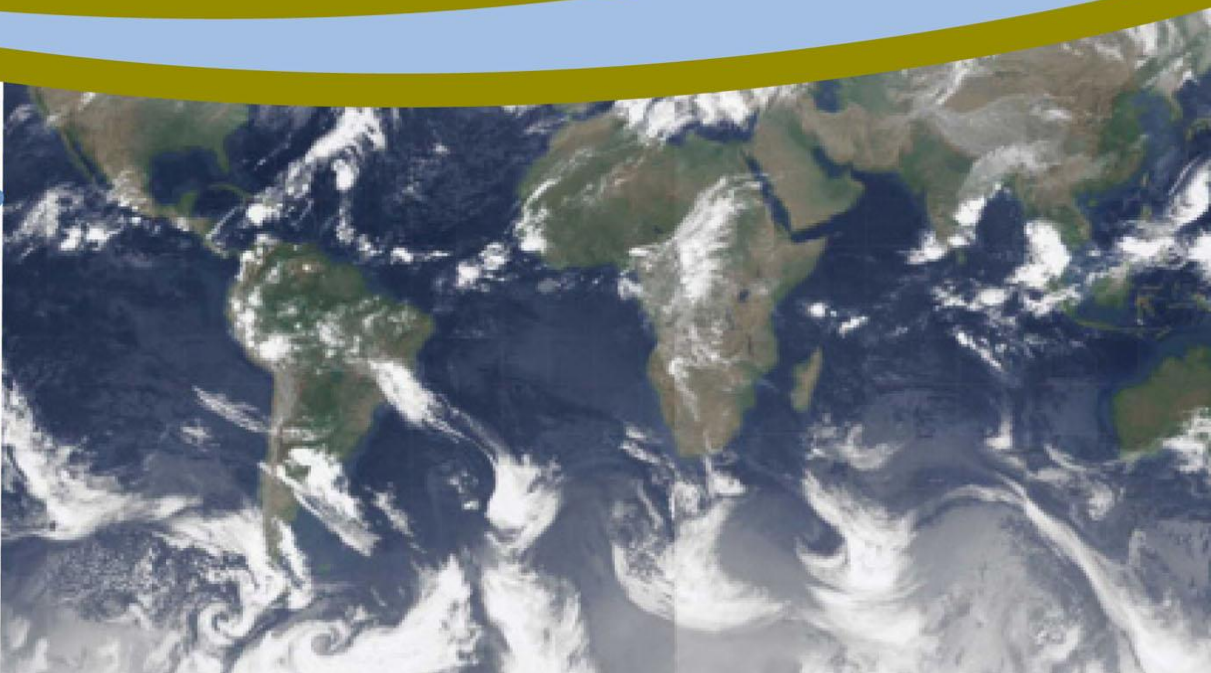
**TIGGE**

The THORPEX Interactive Grand Global Ensemble (TIGGE) provides a data base of ensemble predictions from the leading global NWP centres, for scientific research on predictability and development of probabilistic weather forecasting methods

<http://tigge.ecmwf.int>

**The THORPEX Interactive Grand Global Ensemble**

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## THORPEX

THORPEX is an international research programme to accelerate improvements in the accuracy and utility of high-impact weather forecasts up to two weeks ahead.

THORPEX – **T**he **O**bserving system **R**esearch and **P**redictability **E**Xperiment – was established in 2003 by the Fourteenth World Meteorological Congress. THORPEX is part of the World Weather Research Programme, under the auspices of the WMO Commission for Atmospheric Sciences (CAS), and is a key research component of the WMO Natural Disaster Reduction and Mitigation Programme.

## Forecasting high-impact weather

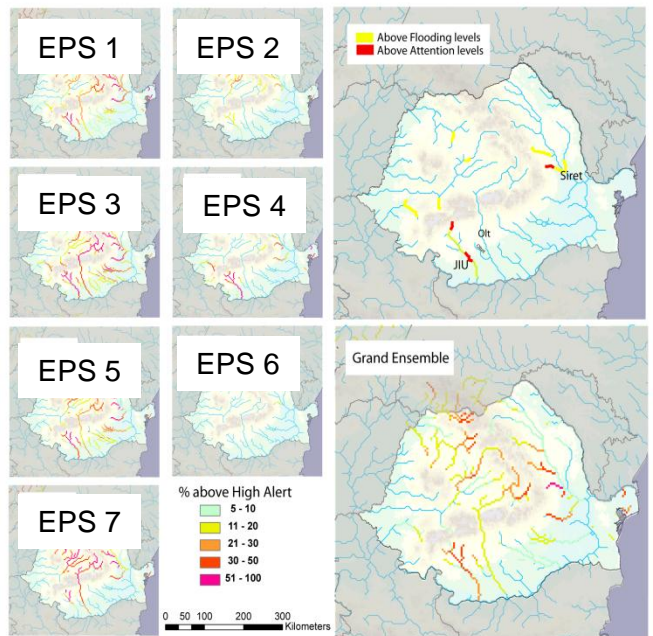
The current success of numerical weather prediction represents one of the most significant scientific achievements of the 20<sup>th</sup> century. Despite the notable increase in forecast skill over recent decades there is room for further improvement, both in the accuracy of forecasts of high-impact weather and the use of weather forecast information for socio-economic risk reduction.

Many weather forecast situations may be characterised as low probability/high risk – the event may be unlikely but the consequences may be catastrophic in terms of loss of life, property damage, loss of revenue etc. Probabilistic forecasting is a powerful tool to improve early warning of such high-impact events.

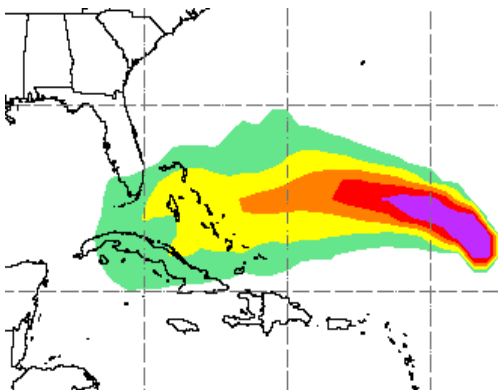
## TIGGE objectives

TIGGE is a major element of the THORPEX research programme:

- Enhancing collaboration on ensemble prediction, internationally and between operational centres and universities.
- Supporting research on weather forecasting, especially applications of ensemble forecasting.
- Enabling new probabilistic forecast products for a future Global Interactive Forecast System (GIFS).



*Predicting flood alerts for Romania using TIGGE*



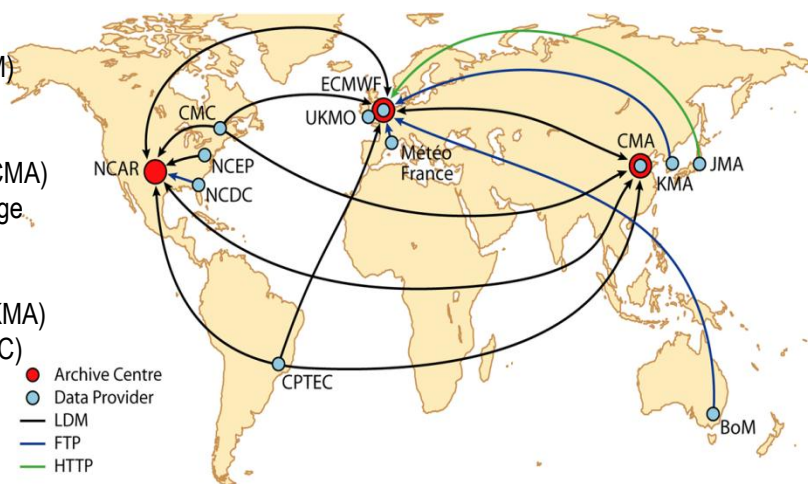
*Forecasting strike probabilities for Hurricane Ike by combining two TIGGE ensembles*

## The TIGGE Archive

Ensemble forecasts are collected in near-real time using a common format at three data archive and distribution centres: China Meteorological Administration (CMA), European Centre for Medium-range Weather Forecasts (ECMWF) and US National Center for Atmospheric Research (NCAR).

The operational forecasting centres supplying daily global forecasts are:

- Australian Bureau of Meteorology (BoM)
- Brazilian Centra de Previsao de Tempo e Estudos Climatico (CPTEC)
- China Meteorological Administration (CMA)
- The European Centre for Medium-Range Weather Forecasts (ECMWF)
- Japan Meteorological Agency (JMA)
- Korea Meteorological Administration (KMA)
- Meteorological Service of Canada (MSC)
- Météo-France (MF)
- UK Met Office (UKMO)
- US National Centers for Environmental Prediction (NCEP)



Data flow that builds the TIGGE Archives

## Using TIGGE data

We invite scientists to use the TIGGE data as a resource for research projects. The data are available for research and education after a simple electronic registration process. Access is normally provided with a 48-hour delay after the initial time of the forecast. Access to data as soon as it becomes available may be granted for field experiments and projects of special interest to THORPEX. Registration for real-time access is handled via the THORPEX International Programme Office.

Data are available via the TIGGE data portals:

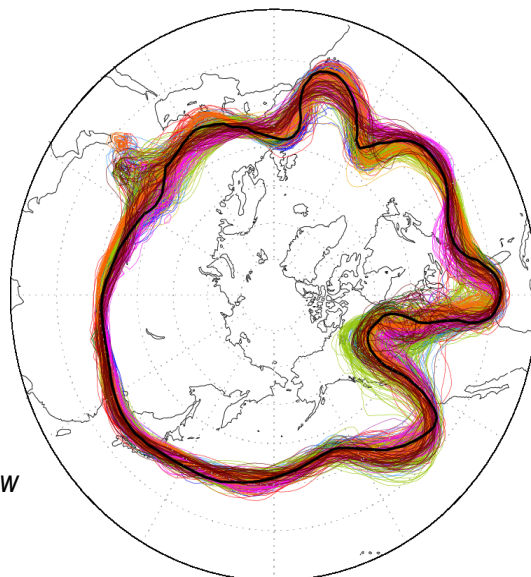
CMA: <http://wisportal.cma.gov.cn/tigge>

ECMWF: <http://tigge-portal.ecmwf.int>

NCAR: <http://tigge.ucar.edu>

BOM CMA CMC CPTEC ECMWF  
JMA KMA METFR NCEP UKMO

Please visit the portals for further details about the functions and tools provided.



TIGGE data illustrates uncertainties in a 3-day forecast of atmospheric flow

Black: ECMWF analysis

## Research using TIGGE Data

The TIGGE data set is a major resource for research and development for weather forecasting, including:

- Calibration of ensemble forecasts, including bias correction and downscaling.
- Combination of ensembles produced by multiple models.
- Development of probabilistic forecast products.
- Predictability and dynamical processes.
- Hydrological applications.

This list is not exhaustive. The TIGGE website includes a full listing of TIGGE research publications.

## TIGGE-LAM

To complement the global TIGGE data set, a panel of experts (called TIGGE-LAM) has been set-up to organize a limited-area-model component of TIGGE. High-priority data from LAM ensemble prediction systems will be also available from the three archive centres.

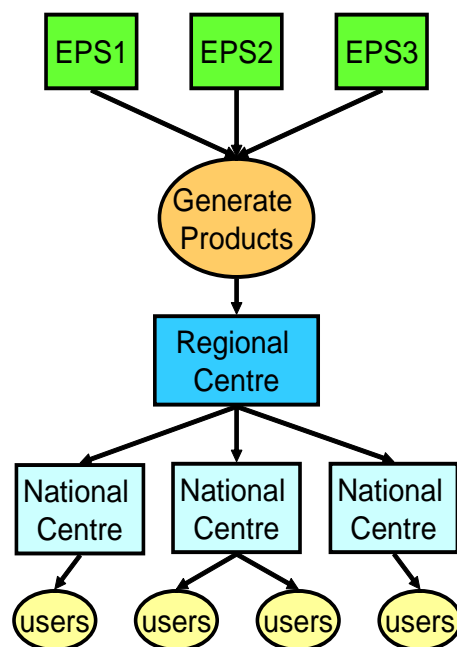
See <http://www.smr.arpa.emr.it/tiggelam/> for more information.

## Outlook

TIGGE provides the basis for the development of a future Global Interactive Forecast System. GIFS aims to improve the probabilistic early warnings of severe weather based on TIGGE research and other strands of the THORPEX programme.

As a first step, GIFS products are being developed to support forecasts of tropical cyclones and heavy precipitation, to be tested in regional Forecast Development Projects.

The TIGGE project is also developing a collaboration with the Climate Historical Forecast project (see <http://www.clivar.org/organization/wgsip/chfp/chfp.php>) to address seamless ensemble forecasting from days and weeks through seasonal timescales.



*Process for generating and distributing GIFS products*

## Further information

The TIGGE project is managed by the THORPEX GIFS-TIGGE working group, with the support of the THORPEX international programme office at WMO. TIGGE is also part of the Global Earth Observation System of Systems (GEOSS).

- Further information about the THORPEX research programme is available at <http://www.wmo.int/thorpex/>
- For more information about TIGGE, GIFS and related research, please see the TIGGE website at <http://tigge.ecmwf.int>