

The Proposed THORPEX/HEPEX Hydrologic Applications Project (THEPS)

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What is HEPEX?

Hydrologic Ensemble Prediction EXperiment

**GOAL: to demonstrate how to produce reliable
hydrologic ensemble forecasts**

What is THORPEX?

THE Observing system Research and Predictability EXperiment

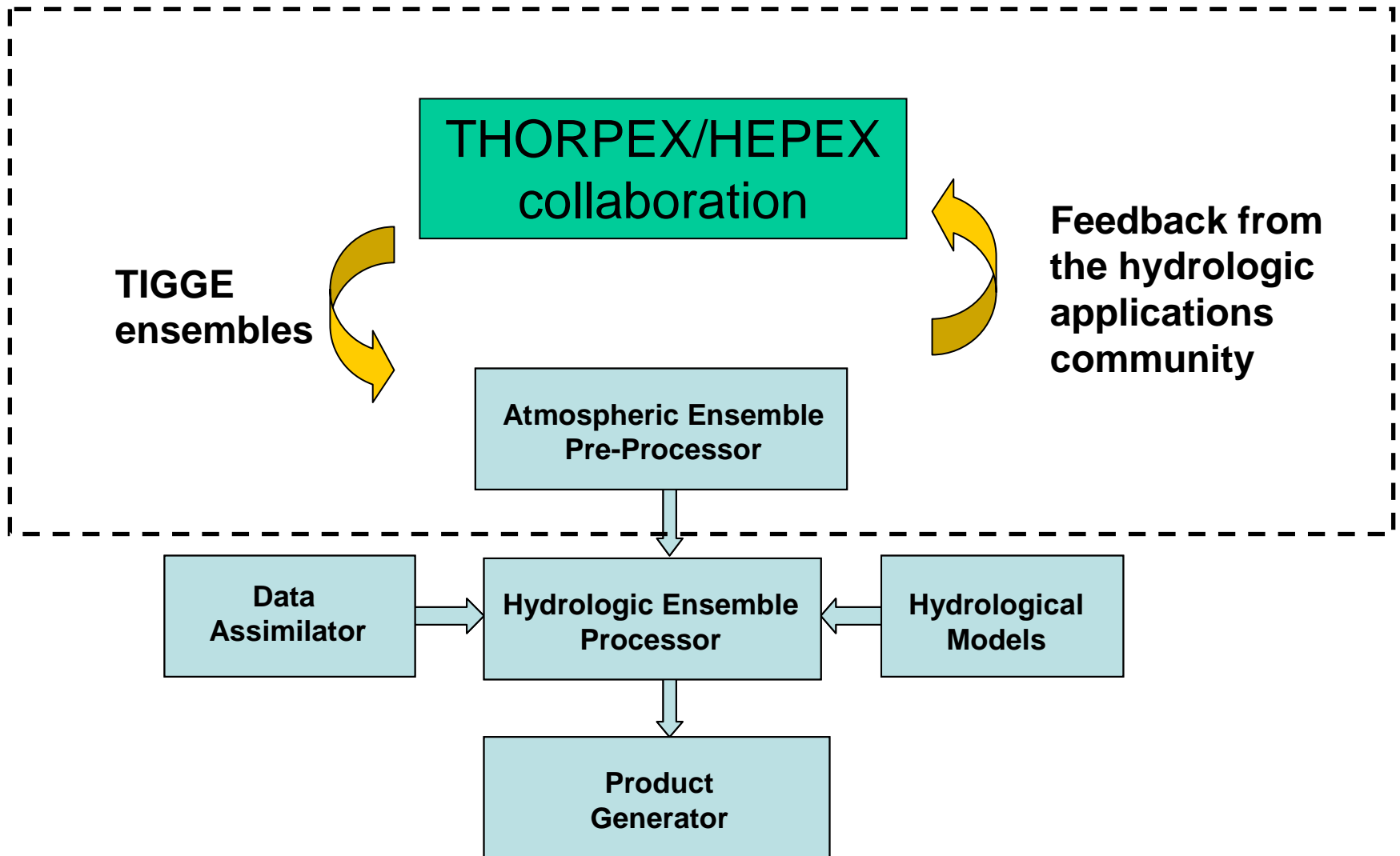
**GOAL: to improved the accuracy of 1-day to 2-week
high-impact weather forecasts**

TIGGE: THORPEX Interactive Grand Global Ensemble Project

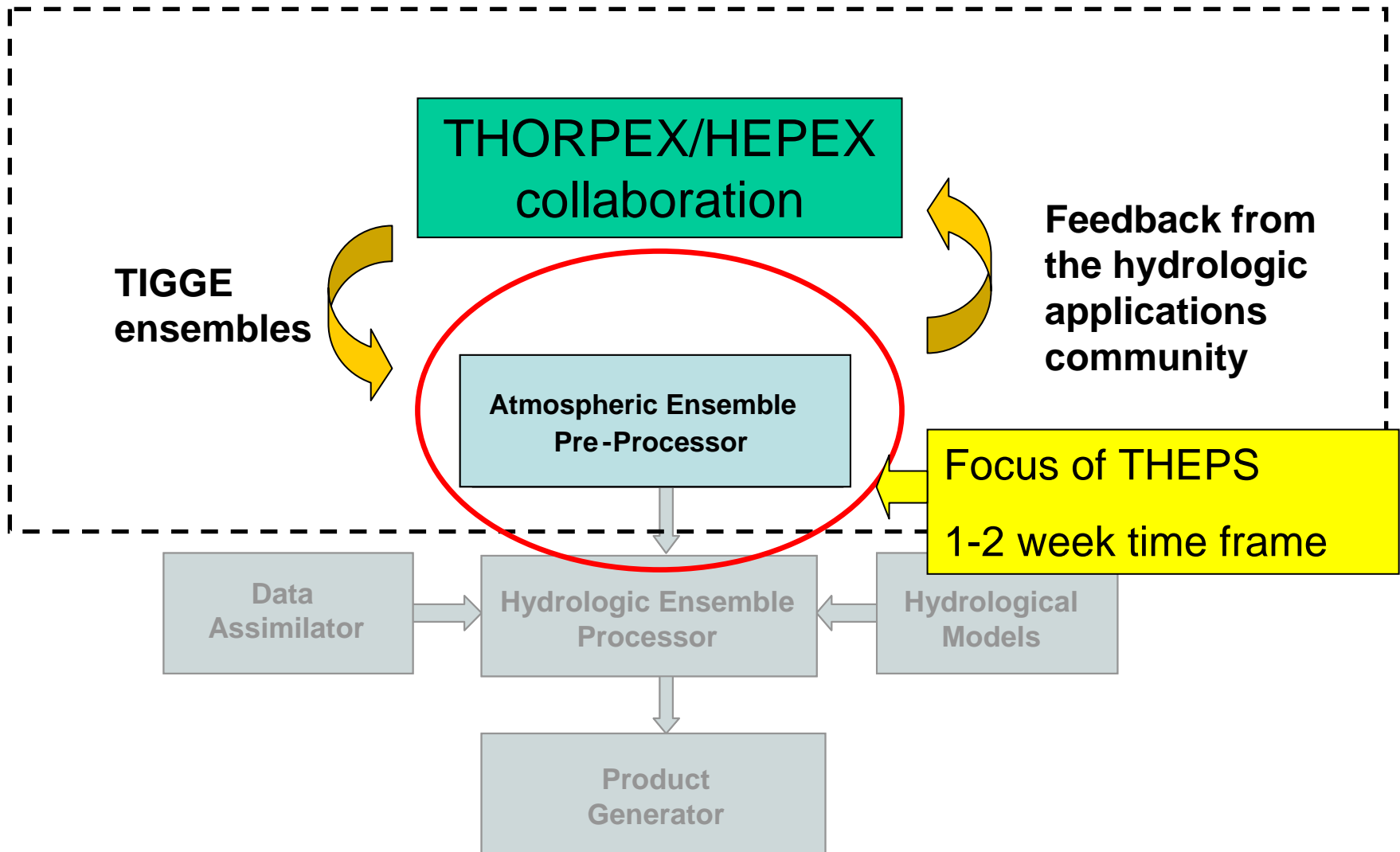
1st workshop held March 2005 at ECMWF

- key component of THORPEX
 - international collaboration on development of ensemble weather predictions
 - a deeper understanding of forecast error and uncertainty
 - develop a prototype Global Interactive Forecast System (GIFS)
 - **promote socio-economic benefits through applications research**
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What is the connection?



What is the connection?



Purpose of THEPS

- 1) To meet the HEPEX meteorological forecast data requirements from the THORPEX (TIGGE) database
 - 2) To provide feedback to the THORPEX community on the strengths/limitations of their forecasts for hydrologic applications
 - 3) To help the international hydrologic community understand how to optimally apply meteorological forecasts
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What does THEPS need?



1. DATA

Hydrologic data requirements

Primary

- precipitation
- air temperature

Secondary

- incoming LW SW radiation
- humidity
- wind speed
- air pressure

Proposed TIGGE archive (surface, at 6hr)

- ✓ Precipitation (frzn + liq.)
- ✓ 2m air temperature, min, & max
- ✓ solar radiation
- ✓ thermal radiation
- ✓ 2m dew point
- ✓ 10m U- and V-velocity
- ✓ Pressure
- Latent and sensible heat flux
- Snowfall, snow depth, cloud cover, sunshine duration

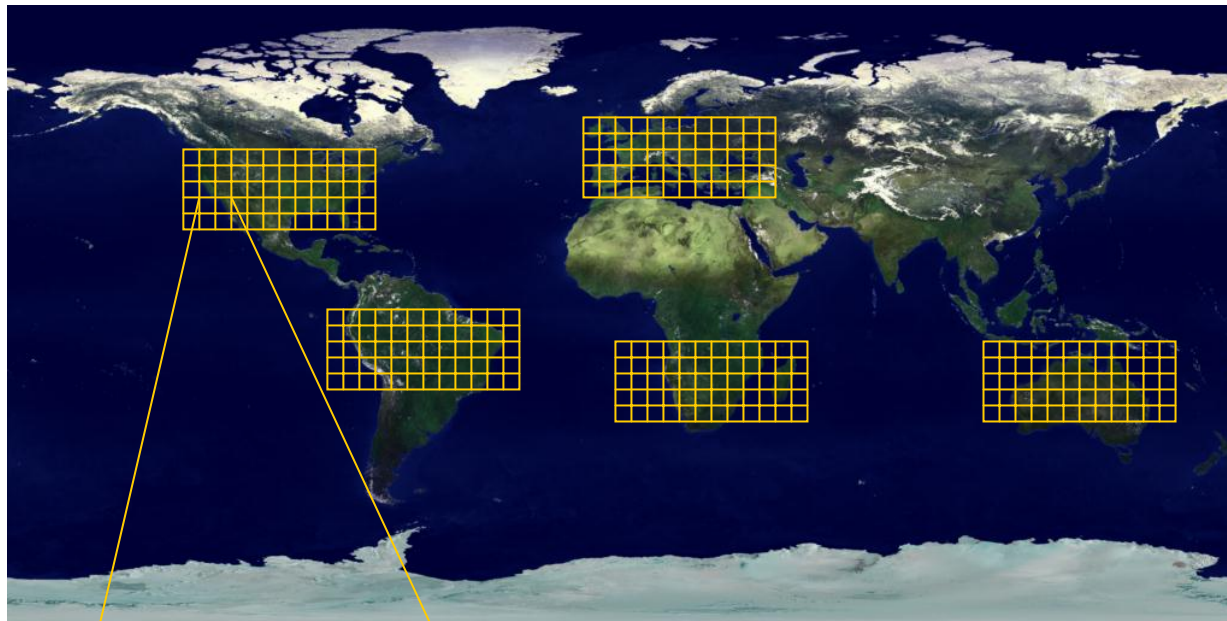
Proposed TIGGE data will include...

- ensemble weather forecasts routinely collected from participating centers around the world.
- observational data and existing data sets (reanalysis included)
- data generated during the TIGGE project

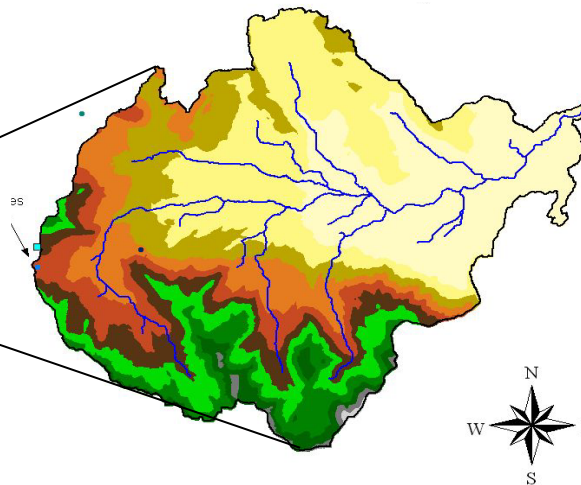


TIGGE data policy

- Available for research purposes
 - User interface for access to central archives
 - Allow subsetting of ensemble data
 - Open-source sharing of post-processing software
- Collection to start ASAP, research access in 2006
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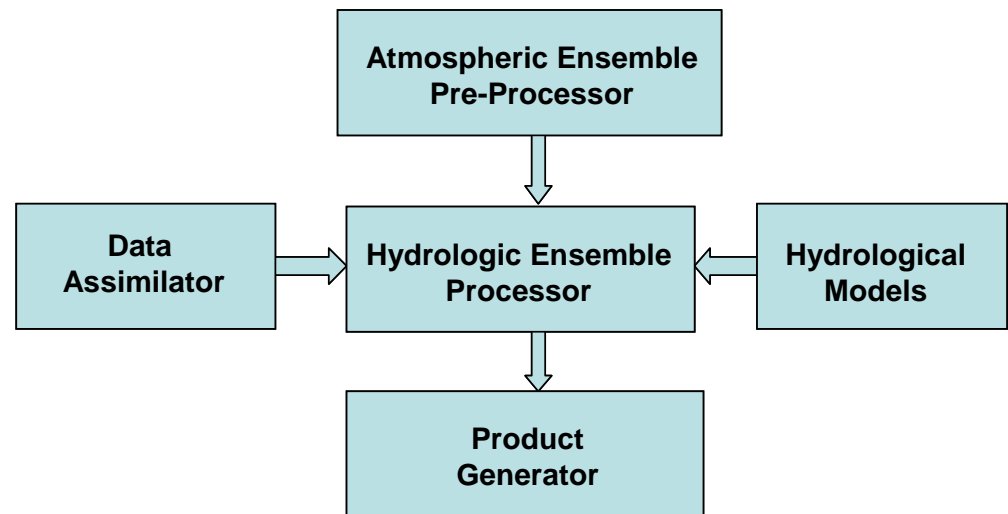


2. Techniques to extract meteorological forecast data for basin scale applications



3. Testbeds with good hydrometeorological data sets

- to calibrate models and pre-processors
- to remove forecast biases (meteorological and hydrological)
- for forecast verification



MModel Parameter Estimation eXperiment



- Suggest MOPEX data as a starting point
 - Access to ground-based hydromet data for both HEPEX and THORPEX
 - Consistent study sites across HEPEX
 - Organized, comprehensive data sets
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MOPEX Data

<http://www.seas.ucla.edu/~thogue/MOPEX/>

U.S. - 436 basins

40-50 years of hourly precipitation, streamflow, & surface meteorology, soils, vegetation

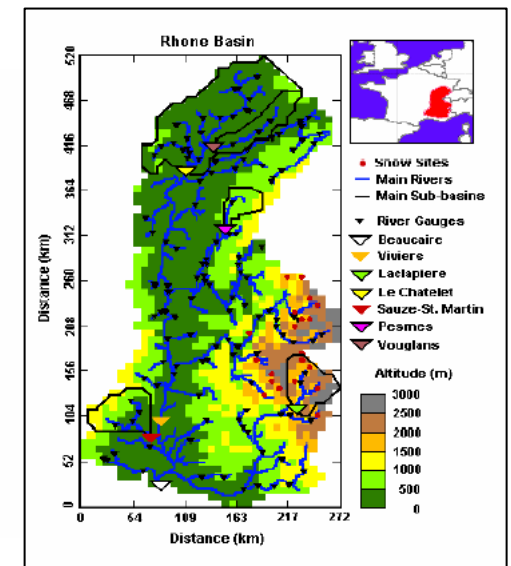
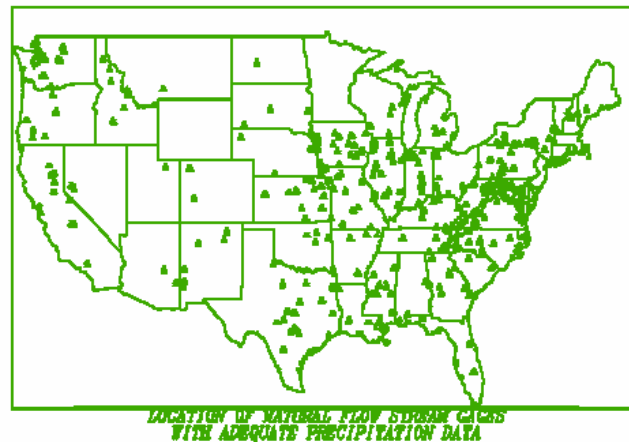
France – 40 basins

6 years of hourly precipitation, streamflow, & surface meteorology, GIS data sets

Australia

South America

Others...



4. YOUR HELP



...to help formalize a plan

- id. candidate regions
- specify time and spatial scale sampling strategies
- develop THEPS data system strategy

...to provide suggestions & feedback during workshop

...to participate

Summary

Key goals of HEPEX and THORPEX supported by THEPS...

- to bring international hydrological and meteorological communities together
 - to understand the requirements of an ensemble weather forecasts system to support hydrologic predictions
 - to understand the socio-economic benefits of TIGGE products
 - to understand the meteorological and climate uncertainties represented in weather forecasts
 - to provide reliable forecasts to the user communities for the protection of the economy, public health and safety
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THEPS benefits...

- + Meet HEPEX weather forecast data requirements from TIGGE database
 - + Develop hydrologic applications for TIGGE forecasts and provide feedback to THORPEX community
 - + Enable PI driven research through convenient access to meteorological forecasts and hydrologic basin data
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HEPEX website

<http://hydis8.eng.uci.edu/hepex/>

Comments, suggestions, & contributions are welcome.

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Thanks!

Why we make forecasts

THE FAR SIDE



"Oh! Four steps to the left and then three to the right! ... What kind of a dance was I doing?"