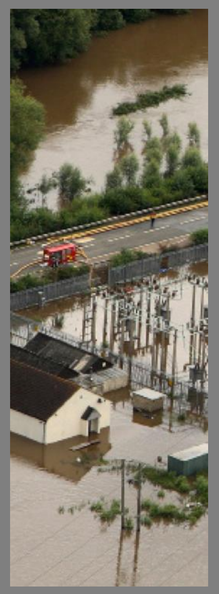

Challenges in setting up a multi-model hydrometeorological forecasting system –

lessons learned from the SEE-MHEWS-A project

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Summary

Main goal: Strengthen the existing early warning capacity of natural hazards in south-eastern Europe

The project is led by WMO and supported by the World Bank and the European Commission. The project has18 participating countries from the region

A prototype of a flood early warning system using local information and multiple models to assess the hydrometeorological risk in selected catchments.

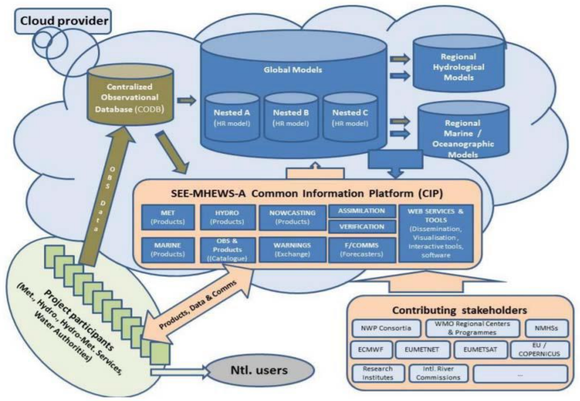


Figure 1. Schematic view of the SEE-MHEWS workflow

The aims of the project are:

1. to strengthen co-operation between national, regional and global authorities;
2. to enhance national multi-hazard early warning systems by making tools and data available to the participating countries and other beneficiaries;
3. to implement impact-based forecasts and risk-based warnings using a multi-model hydrometeorological forecasting system to support all actors in their decision-making and actions, and
4. to harmonize forecasts and warnings in trans-boundary catchments.

Gather more observations

Through the data poiicy we have managed to gather data from 491 more stations with more than 23000 more observations/day. We are also receiving a total of 10 real-time hydrological stations over the test catchment.

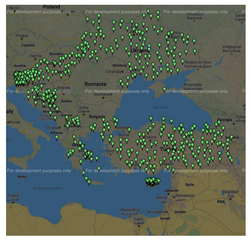
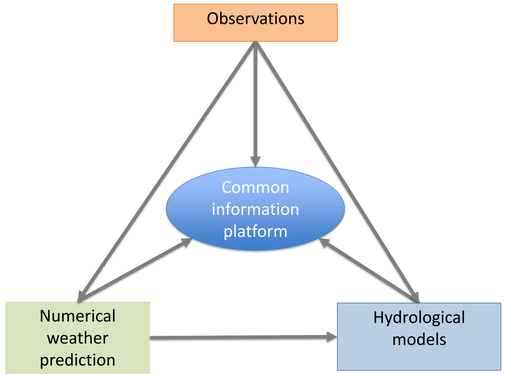


Figure 2. Additional observations

Modelling chain setup

The modelling chain in SEE-MHEWS-A follows a multimodel approach both from the NWP side as well as the hydrological models (fig. 3). The 4 NWP models are implements in near-realtime on ECMWF's HPC. The NWP models run are then fed into the hydrological models to create a full multi-model system.



4 NWP limited area models:

- COSMO
- ICON
- ALADIN
- NMM-B

3 Hydrological models

- LISFLOOD
- HBV
- WFLOW

Figure 3. SEE-MHEWS modelling chain

Common Information Platform (CIP)

The output of the observations, meteorological and hydrological models as well as the observational data and nowcasting is made available to the users through a web-based platform (fig. 4). The platform is hosted on the European Weather Cloud (EWC).

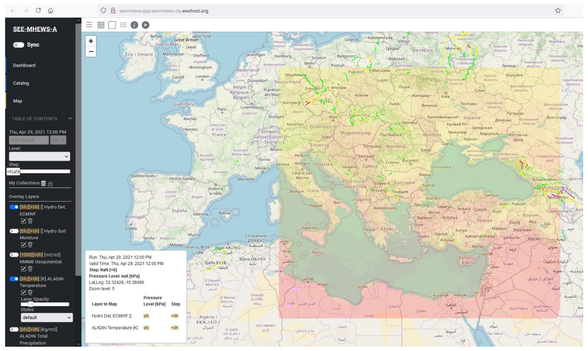


Figure 4 SEE-MHEWS Common Information Platform (CIP). The layer is the larger meteorological domain.

Co-design of products with the forecasters

The development of the CIP is done in true do-development with the forecasters in the region. Through regular meetings with the modelers and web developer they have a say in everything from which layers to display to colour schemes and functionality.

The forecasters received feedback on their requirements, and the suggestions are implemented if technically feasible.

Conclusions

- First pilot of full chain implemented
- Co-design is essential for:
  - the usability of the system and
  - to ensure fit-for-purpose
- The project has led to higher collaboration and increased sharing of the data

Next steps

- Implementation of the operational system
- Skill assessment of the models over the catchment area
- Uptake and ownership of the system

ECMWF

Copernicus Europe's eyes on Earth

WORLD METEOROLOGICAL ORGANIZATION

EFAS

THE WORLD BANK