ILMATIETEEN LAITOS
METEOROLOGISKA INSTITUTET
FINNISH METEOROLOGICAL INSTITUTE

Commentary:
Value of weather data for optimizing hydropower production, hydrological forecasts and climate impact assessments

Sarajevo Energy & Climate Week

26.9.2023 **Anni Karttunen**

Finnish Meteorological Institute

- National Meteorological Institute of Finland, established in 1838

- The FMI provides high-quality services and scientific know-how on the weather, atmosphere and seas for the safety of the society and businesses.

- All services are based on high-quality research, observations and expertise.

- World leading weather observation, modeling and forecast production systems
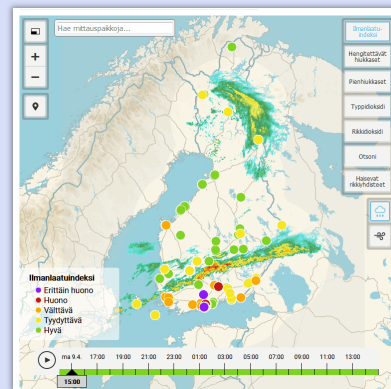
Public and commercial weather services

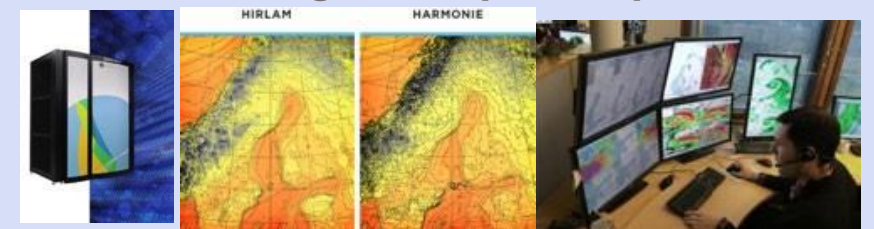**Civil and military aviation**

Observation networks

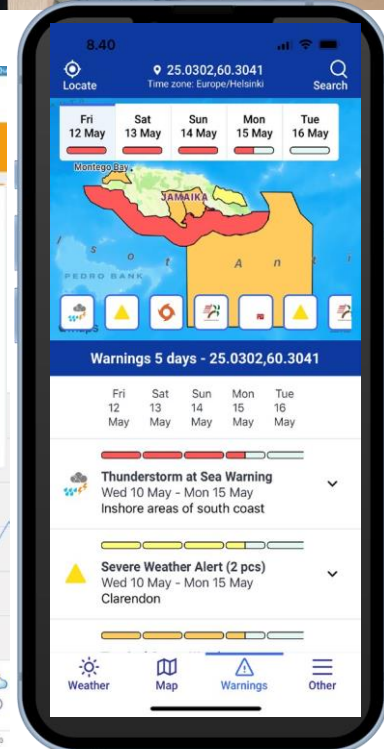**Air Quality**

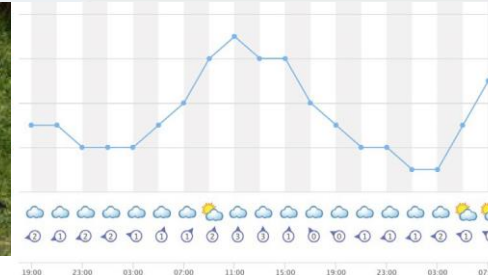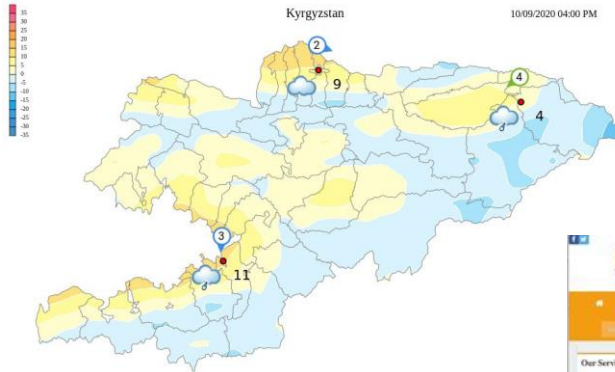*Forecast and Early Warning Services*

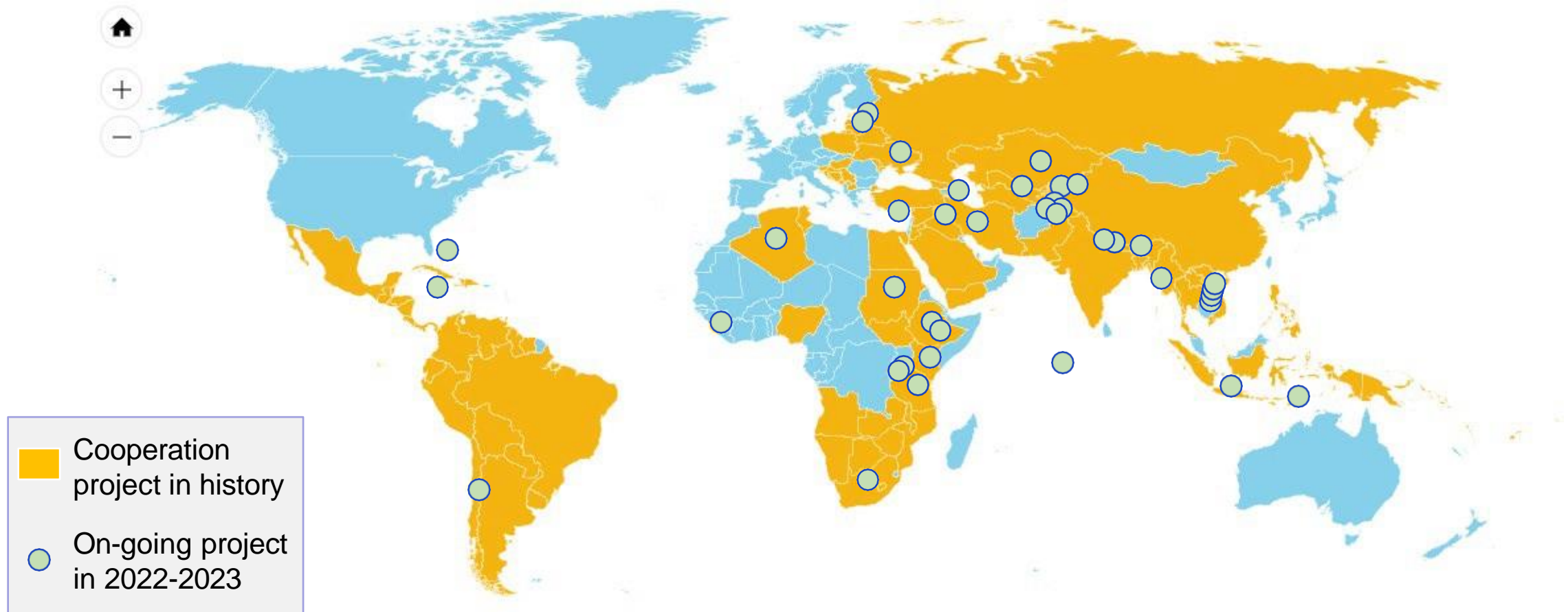*Modelling and supercomputers*

FMI - International Projects Activities

All projects aim to support national Hydrometeorological services or equivalent institutes to provide better weather, environmental and early warning services:

- Institutional Capacity Building
  - Training
  - Technical Assistance
  - Feasibility and Socioeconomic Studies
- Instruments and network development
  - Automatic Weather Stations
  - Weather radars & lightning detection
  - Weather satellites
  - Data management
- Numerical Weather Prediction models
- Verification and validation methods
- Quality Management Systems
- Weather and climate services & products
- FMI SmartMet Weather Information System
  - SmartMet mobile app
- Energy studies, hydro, wind & solar
- Air quality measurements and modelling

FMI – over 100 countries of development co-operation

Cooperation project in history

On-going project in 2022-2023

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FMI - International Projects Activities

- Several co-operation projects in the region
  - Different funding instruments e.g. EU twinning, Finnish ICI instrument
  - Hydrometeorological and air quality topics

- The Rehabilitation and Modernization of the Hydrological and Meteorological Observing Network and Data Exchange Procedures in Serbia and Bosnia Herzegovina 2015-2016
  - Rehabilitate the damage on observation stations caused by floods in 2014 and improve the network along Sava river
  - Strengthen data collection process and exchange in the Sava Basin
  - Improve capacities in flood forecasting and warning

National flood center

- The National Flood Centre's main task is to **forecast, warn, develop and share information about Finland's flood and draught situations**. (services 24/7)

Fresh water floods
- Warnings (SYKE)
- Water situation and forecasts (SYKE)
- Flood maps (SYKE, ELY)

Heavy rain floods
- Warnings (FMI)

Seawater floods
- Warnings (FMI)
- Sea level forecasts(FMI)
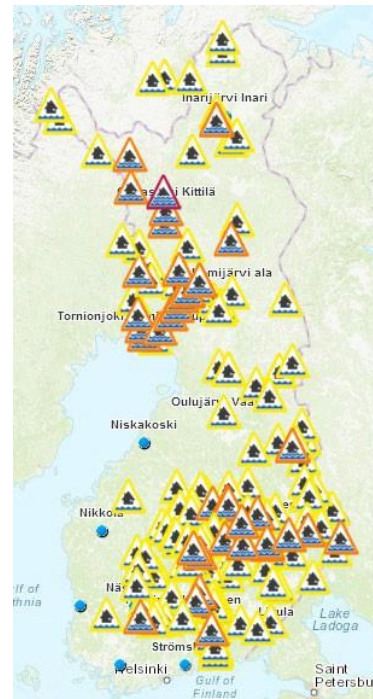- Flood maps (SYKE, ELY)

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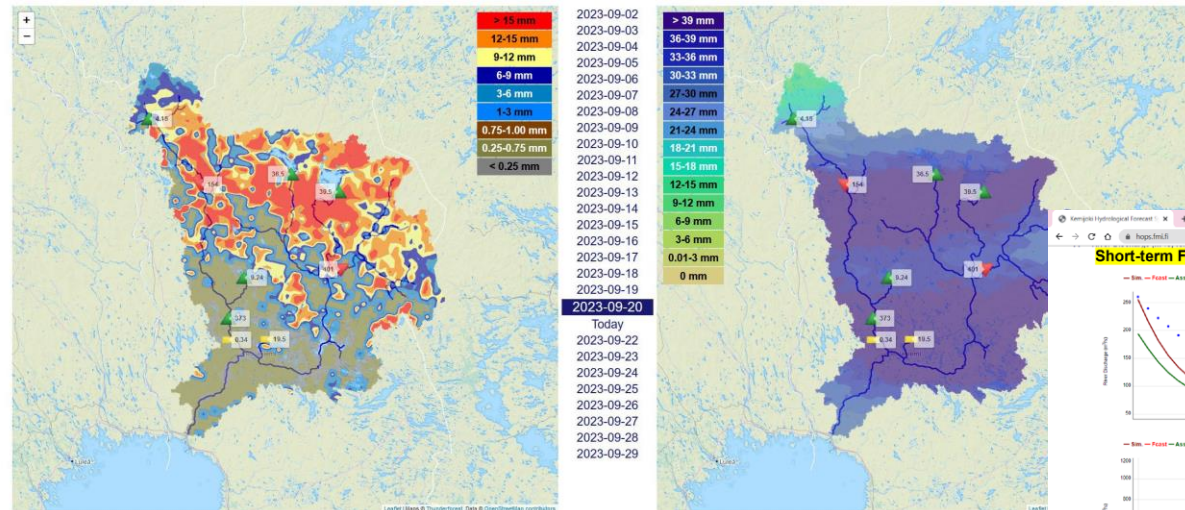
Kemijoki Hydrological Forecasting

A Webservice Running on FMI Internal Servers
- Daily 10-Day Deterministic Hydrological Forecasts
- Monthly 90-Day Seasonal 51 Ensemble Hydrological Forecasts

4 primary elements:

1. HOPS Land surface parameters modelling (5x5 km spatial resolution)

2. HOPS Streamflow routing:
   Streamflow Hydrographs/ point forecast

3. Machine learning based streamflow forecasts

4. Assimilation of snow remote sensing data
   - Correction of snowfall with satellite data based snow water equivalent observations → reduces spring peak flow volume errors

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