Forecast-System for the Rur-Reservoirs

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1. The Rur Reservoirs

2. Project objectives

The Rur-Reservoirs

Characteristics

- 2.372 km² catchment area
  - 799 km² controlled by reservoir-system $\approx \frac{1}{3}$
- 726 Mio. m³ annual run-off
  - 372 Mio. m³ controlled by reservoir-system $\approx \frac{1}{2}$
- 9 Reservoirs
  - ▲ 3 exclusively used for drinking water supply
  - ▲ 5 compose the Northern-Eifel-Reservoir-System
    - ⇨ Objectives: **Flood protection** and water supply for **dinking water** and **low water enrichment**
  - ▲ the Wehebachtalsperre used for drinking water supply and flood protection
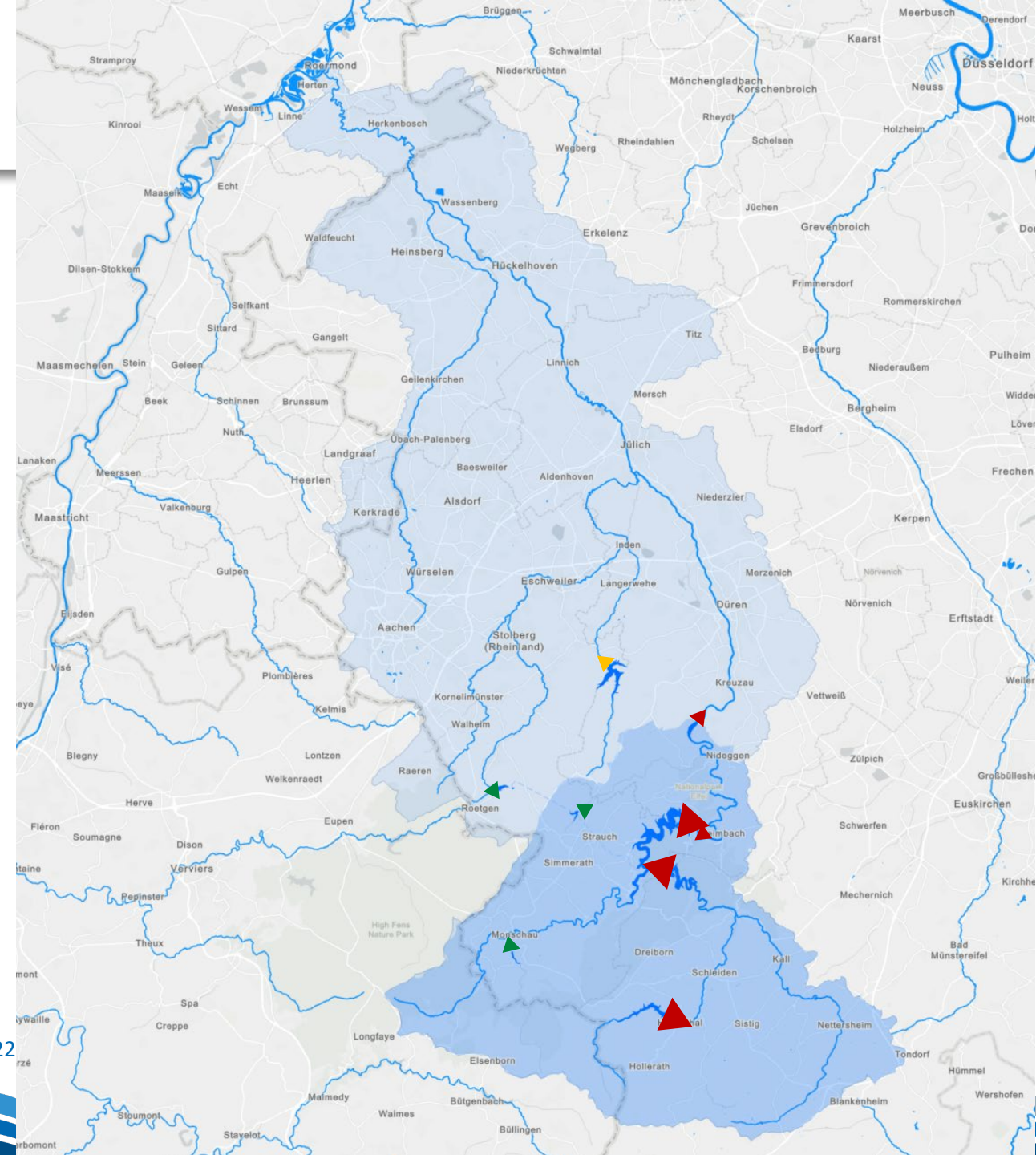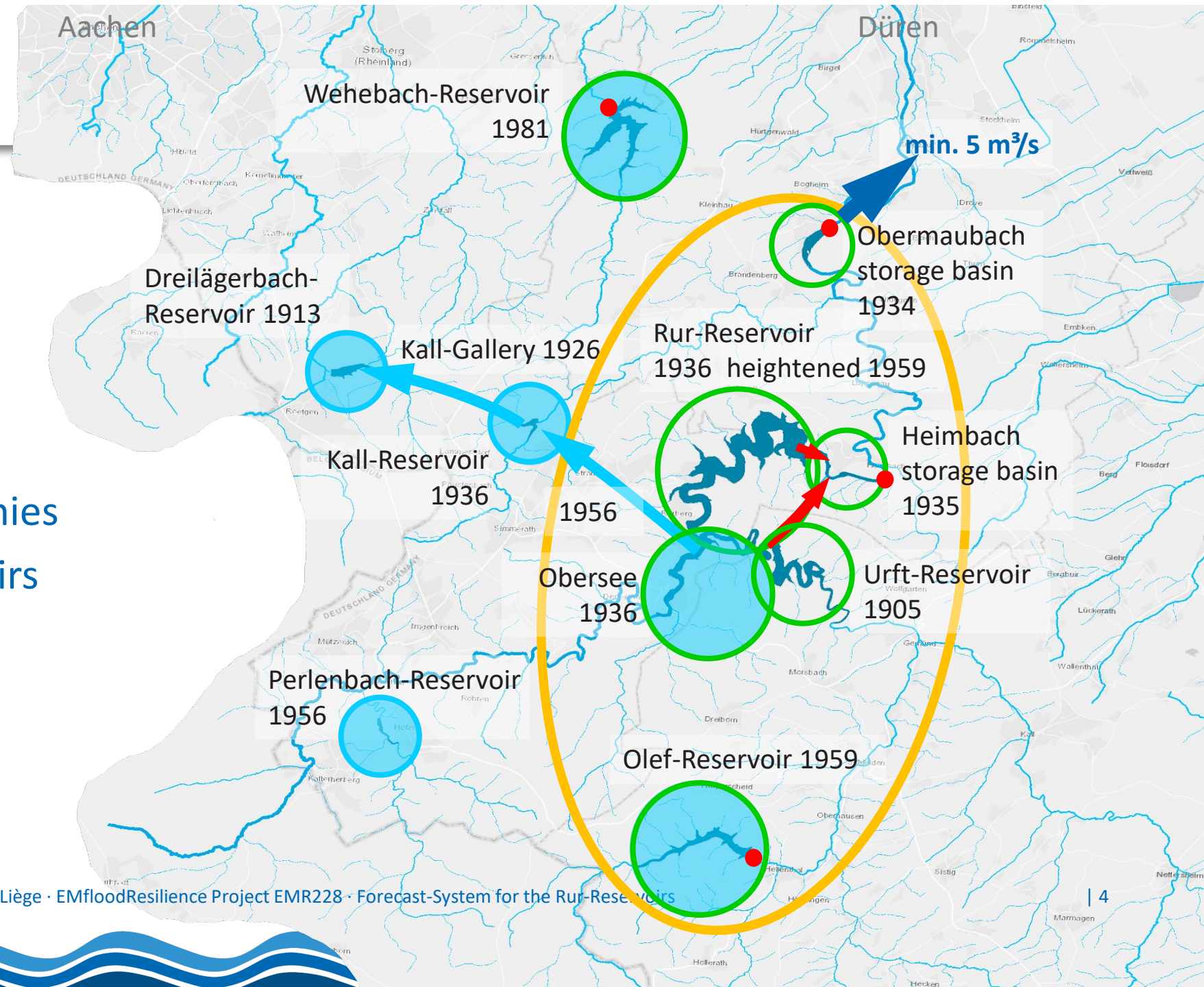
Norther Eifel Reservoir-System

9 reservoirs

○ 6 WVER-owned

○ 3 water supply companies

● drinking water reservoirs

• hydro power

Total volume of WVER-reservoirs: 302 Mio. m³

Wehebach-Reservoir 1981

min. 5 m³/s

Obermaubach storage basin 1934

Dreilägerbach-Reservoir 1913

Kall-Gallery 1926

Rur-Reservoir 1936 heightened 1959

Heimbach storage basin 1935

Kall-Reservoir 1936

1956

Obersee 1936

Urft-Reservoir 1905

Perlenbach-Reservoir 1956

Olef-Reservoir 1959

Aachen

Düren

The Rur-Reservoirs

Objectives

- Flood control
  - Max. 70 Mio. m³ of retention room
  - Reduction of a 100-year flood from 307 m³/s to 60 m³/s
- Low-Water enrichment
  - Increase of NNQ from 0,45 m³/s to 5 m³/s
- Provision of water
  - 80 Mio. m³/a raw water for drinking-water supply
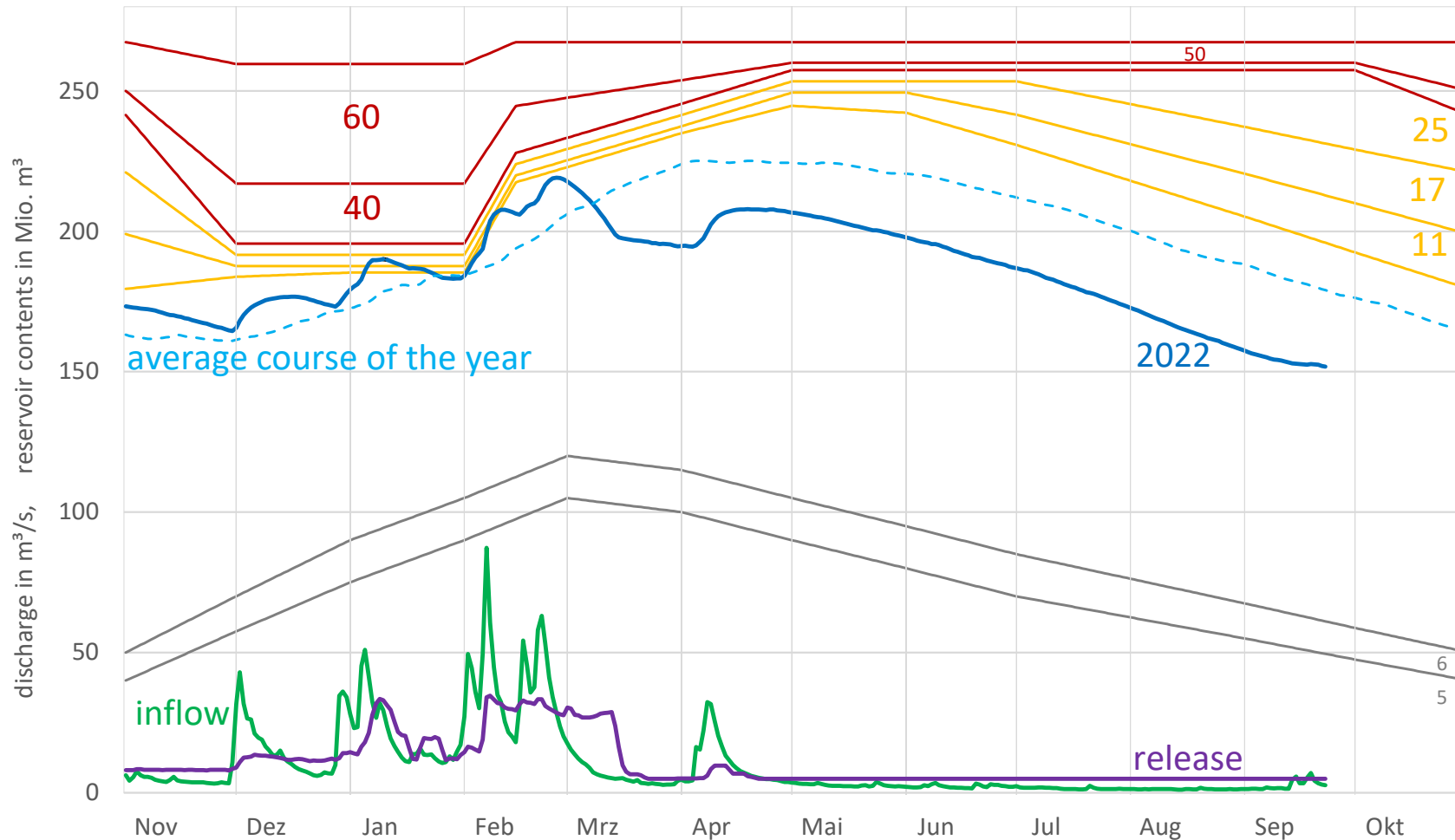 - 100 Mio. m³/a industrial water

Water-Power and Tourism purposes allowed where possible

Opponent Tasks!
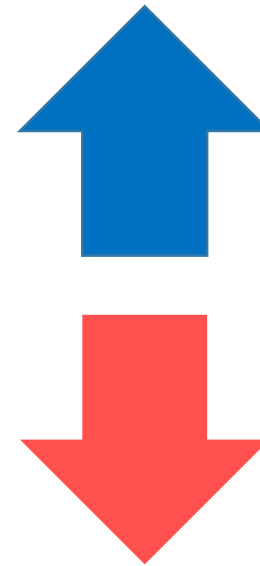
Low-Water enrichment and
provision of water need
filled reservoirs

Flood control needs
empty reservoirs

- **Flood control storage**
  - Large in winter
  - Small in summer
- **Preceding relief** with high reservoir contents
- water conservation with low reservoir contents
- Further detailed operation-plans for each reservoir

Achieve better information about the response of the reservoir-system

- Operation plan based on more then 100 years of inflow data ⇨ Lamellenplan to achieve goals

- Standardized Precipitation Index (SPI) for the watersheds of the reservois ⇨ hydrologic status (drought-warning)
  - SPI-Forecast (in the end of 2022) ⇨ how will the hydrologic status change

⇨ *Existing forecast-models for the lower Rur lack of information about the future delivery from the reservoir-system*

+ Forecast of the Reservoirs discharge ⇨ downstream information/warning

  - Support the reservoirs operation

  - Information for downstream discharge forecasting-systems (LANUV and WL)

  - Information for disaster coordination centers

  - Information for water sports

  - etc.

EMfloodResilience Project EMR228

■ Leadpartner: Waterschap Limburg

■ Other Partners:

- Université de Liège, Delft University of Technology, RWTH Aachen University

- KNMI, Rijkswaterstaat, Province de Liège, Research Institute for Nature and Forest (Flanders)

- De Vlaamse Waterweg, Gemeente Weert and Wasserverband Eifel-Rur

WP3 D.T3.1.1 Forecast system Rur

⇨ Improve the forecast information in the Rur-Catchment

Improve the forecast information in the Rur-Catchment

⇨ Three steps of improvement:

1. Find transnational agreed specifications of forecast-requirements

- Share knowledge about available measured and forecast data. Establish and enhance data exchange
- Definition of information-products needed for the various forecast-models (LANUV, WL, …)

**2. Setup of a Forecast-System for the Rur-Reservoir-System**

- Extension of the existing Reservoir-Operation-Model (TALSIM) with simple hydrologic models of the catchments
- Implementation of a FEWS-platform as data hub for measured- and forecast-data, to trigger and control the model calculations as well as to prepare and distribute resulting forecast-information

3. Application of the information-products

- Application to the existing forecast-models and feedback to enhance information-products
- Considerations about possible further improvements of the reservoir-forecasts for the international Rur (and Meuse)

Setup of a Forecast-System for the Rur-Reservoir-System (FSRRS)

- Extension of the existing Reservoir-Operation-Model (TALSIM) with simple hydrologic models of the catchments
  - Include every reservoir- and gauge-catchment
  - Discharge-volume based calibration, 1h-timestep
- Implementation of a FEWS-platform:
  - data hub for measured- and forecast-data
  - trigger and control the model calculations
  - prepare and distribute forecast-information
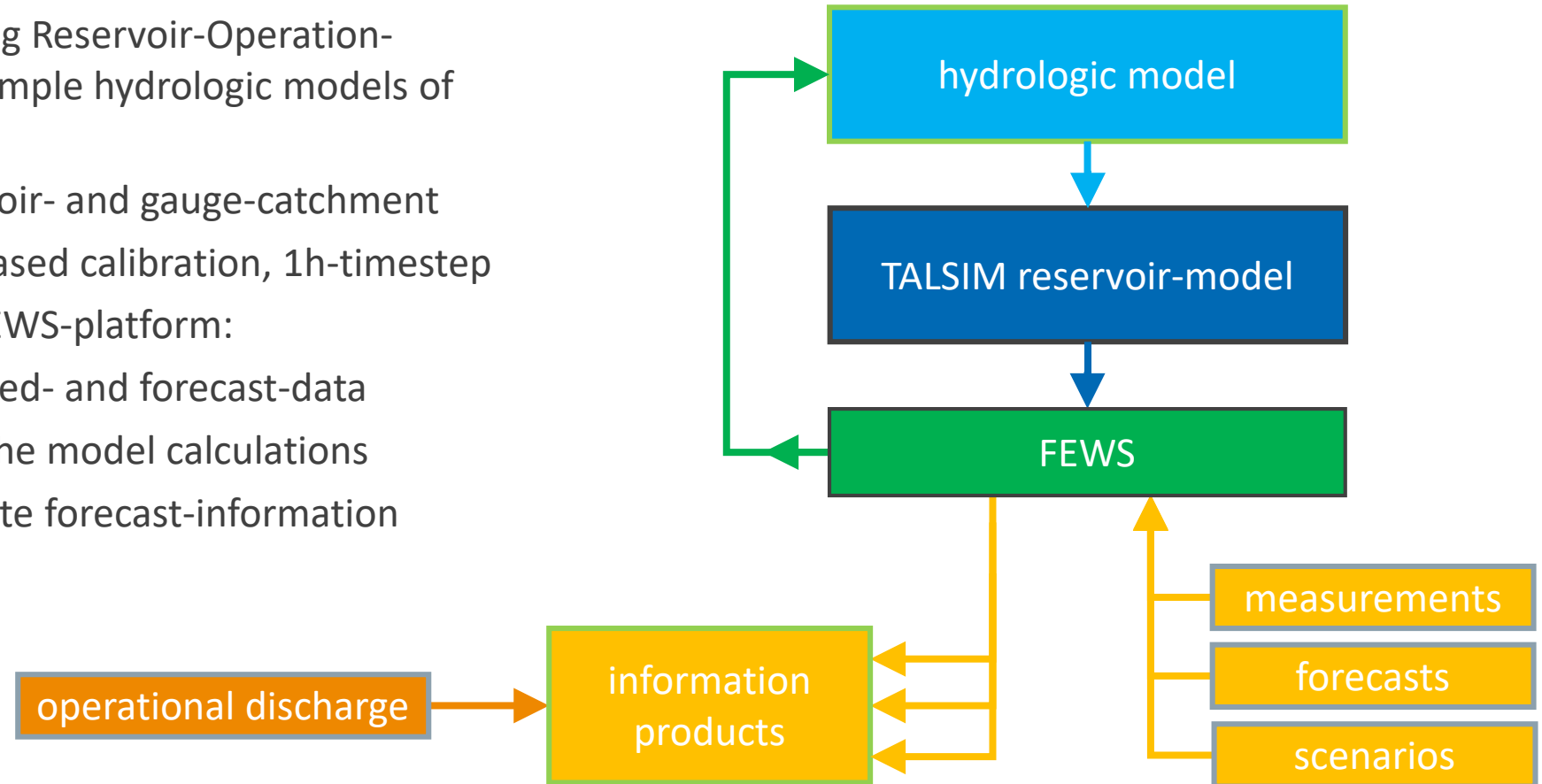
Schedule overview

	2022-Q3	2022-Q4	2023-Q1	2023-Q2	2023-Q3	2023-Q4
3.1 Specifications of forecast-requirements	██	██				
3.2 Setup of Forecast-System		██	██	██	██	
3.3 Application of information-products					██	██

**Thank you
for your attention**

christof.homann@wver.de