

# OPERR

## Operational Pan-European River Runoff

### MONITORING THE IMPACT OF CLIMATE CHANGE ON RIVER DISCHARGE

All populated areas in the world experience changes in river discharge due to climate change. Some areas face large increases in flood flows whilst others experience water scarcity. A hydrological model that can provide hind-cast data as well as predict daily river-runoff data is therefore necessary. The OPERR project takes on this challenge.

Climate change has vast consequences to the hydrological cycle. It causes increasing temperatures, which leads to extreme precipitation, for instance when large amounts of rain fall instead of snow; causing floods, or when rain does not fall at all, leading to droughts. In order to be prepared and able to predict the timing, the frequency and magnitude of flood and droughts in the often very populated areas where rivers run into seas, a daily hydrological model that produces river-runoff measurements is necessary.

In this respect, the OPERR project is set to provide two-fold support. Firstly, the project will provide data for monitoring and warning of flooding events, as well as data on predicted high concentrations of nutrients in flood water, which may have negative effects on coastal ecosystems. Secondly, the project will validate and apply

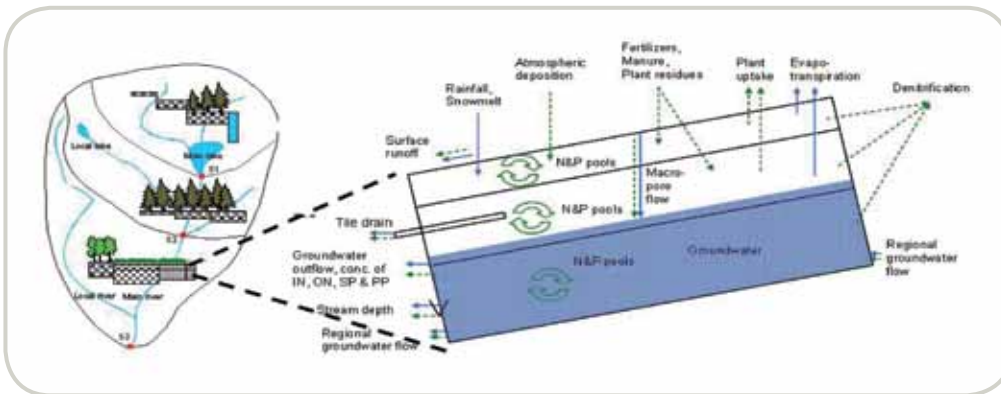
data for shelf sea models, supporting the performance of regional ocean models, which are effected by the relative degree of river discharge.

OPERR is based on an already running river discharge model, HYPE, developed by the GMES Geoland2 service project for the Baltic Sea. The new OPERR system will add value to this existing capability by responding to GMES downstream service needs to enhance coastal ocean models, and the work of regional environmental commissions such as HELCOM and OSPAR. Moreover, OPERR will add value to the existing model by integrating other parameters linked to soil type and land cover data taken from other GMES products and the CORINE database.



**LENNART FUNKQUIST**  
IS PROJECT COORDINATOR

Applying such an integrated approach, OPERR will develop a GMES service that can be used by both environmental institutes and small businesses dealing with coastal management and operational shelf sea modelling.



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**OPERR will develop an operational real-time river discharge model covering all of Europe.**

### QUESTIONS & ANSWERS

#### What do you want to achieve with this project?

The result of the OPERR project will fill in an important gap in the availability of forecast and hindcast data of river discharge to both land areas and shelf seas. It addresses a pressing need for reasonable estimates of runoff and nutrient loads to coastal areas.

#### Why is this project important for Europe?

Several parts of Europe are affected by flooding events and increasing nutrient loads. This also affects coastal areas leading to increased blooming of harmful algae and oxygen-depleted bottoms. Hindcast data from OPERR can be used for climate scenarios and coastal management.

#### How does your work benefit European citizens?

Forecasts of river discharge can be used for warnings of severe flooding and water quality changes.

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### LIST OF PARTNERS

- Sveriges Meteorologiska och Hydrologiska Institut, Sweden
- Meteorologisk Institut, Norway
- Havforskningsinstituttet, Norway
- Fundacion AZTI/AZTI Fundazioa, Spain
- Marine Hydrophysical Institute - Ukrainian National Academy of Sciences, Ukraine

### COORDINATOR

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### PROJECT INFORMATION

Operational Pan-European River Runoff (OPERR)

Duration: 24 months

EU Contribution: € 396.031

Estimated total cost: € 591.653

