

# EVENT DETECTION IN WATER RESOURCE MANAGEMENT APPLICATIONS



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## THE MOTIVATION FOR EVENT-DRIVEN INFRASTRUCTURES

Classic View and Download services (such as OGC WMS or WFS) do not provide means to access **measurements**. Measurements could be anything that is a phenomenon in the real-world, observed and sensed with specific devices.

Examples can be: water level measurement, discharge (hydrology), air quality parameters, but also information about mobile entities (e.g. tracking of ships). The OGC **Sensor Observation Service (SOS)** is designed to manage observations and measurements and provide access to these.

The ability to **react to certain critical situations** has always been an important task for managers of water resources, ranging from water gauge monitoring to pollution detection. This implies a paradigm shift — from pull-based communication patterns to push-based approaches such as the **Publish/Subscribe** message exchange pattern.

## USE CASES

- **Domain specialists:** responsible for monitoring water networks and facilities (e.g. dam monitoring)
- **Public:** recreational activities (e.g. water level is important for canoeing or fishing)
- **Maintenance staff:** observe states of sensors and react to failures
- Overall goal → receive **meaningful information in near-real time**



## NOTIFICATION CONCEPT

Rules	Notifications	Subscriptions
<ul style="list-style-type: none"> <li>• Define conditions</li> <li>• Are checked when new measurements are available</li> </ul>	<ul style="list-style-type: none"> <li>• Group sets of rules (e.g. threshold overshoot/undershoot, sensor failure)</li> </ul>	<ul style="list-style-type: none"> <li>• Correlate notifications with users</li> <li>• Define the communication channel (e.g. email, web client, mobile, ...)</li> </ul>

REST API with JSON binding

- Analogous to the OGC Publish/Subscribe 1.0 standard
- Uses the same database and conceptual model as the SOS

## TECHNICAL APPROACH

- REST/JSON API
- Allows **lightweight** (web) client development
  - Provides user and group management (administrators create subscriptions; users receive notifications)
  - Supports different types of events (rise of gauge above the threshold, staying above the threshold, fall below the threshold, sensor failures/errors)
  - Sends warnings and all-clear signals for the end user
- The API is an **Open Source** project → collaborators are welcome!

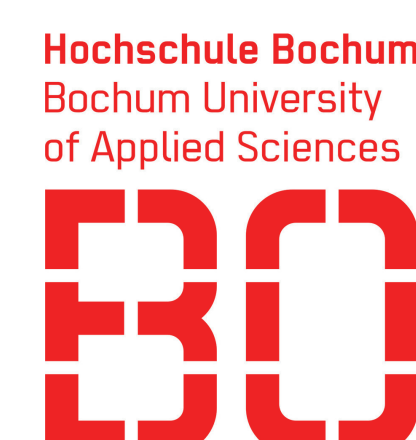
## OUTLOOK

- Web client development
- Triggering of complex processing workflows



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