Combining remote sensing and in-situ data for water body monitoring

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Introduction

- Massive amounts of remote-sensing and in-situ data are available
- Combination of remote and in-situ observations can increase the value of the data
  - Verification
  - Provision of complementary data
  - ...
- Technical framework based on (extended) standards to integrate, jointly access and analyse remote sensing and in-situ data
- In the following: Three different projects working on this goal

MuDaK-WRM

Multidisciplinary Data Acquisition as Key for a Globally Applicable Water Resource Management

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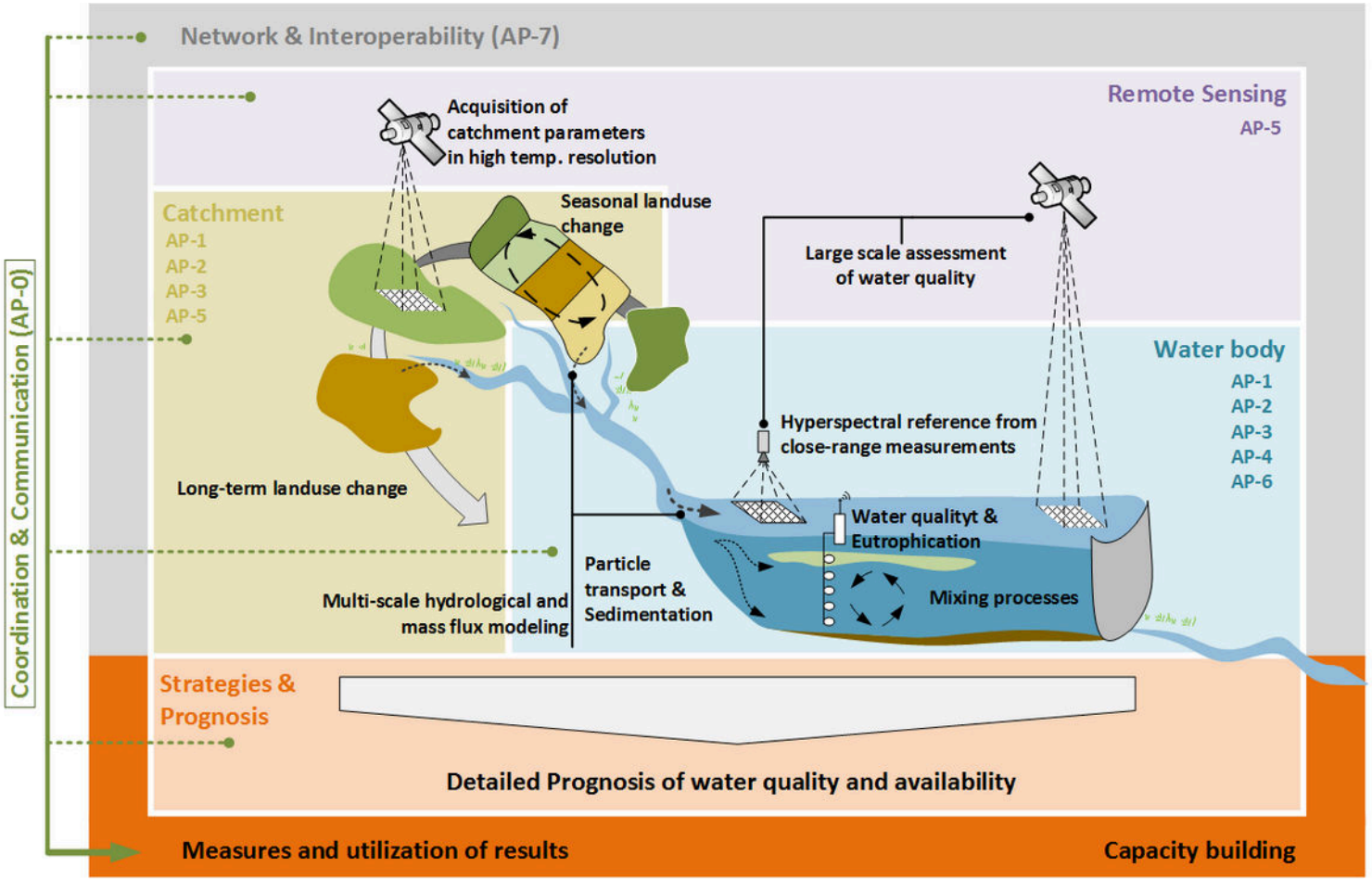
MuDaK-WRM


Network & Interoperability (AP-7)
Coordination & Communication (AP-0)
Remote Sensing
AP-5
Acquisition of catchment parameters in high temp. resolution
Catchment
AP-1
AP-2
AP-3
AP-5
Seasonal landuse change
Large scale assessment of water quality
Water body
AP-1
AP-2
AP-3
AP-4
AP-6
Hyperspectral reference from close-range measurements
Long-term landuse change
Water qualityt & Eutrophication
Particle transport & Sedimentation
Mixing processes
Multi-scale hydrological and mass flux modeling
Strategies & Prognosis
Detailed Prognosis of water quality and availability
Measures and utilization of results
Capacity building

WaCoDiS

- Copernicus-based services for monitoring material inputs in watercourses and dams
- Problem
  - Increased input of sediments and other materials in watercourses and dams, due to
    - Intensified agriculture
    - Extreme weather (in particular alternating heavy rain, drought) due to

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mFUND

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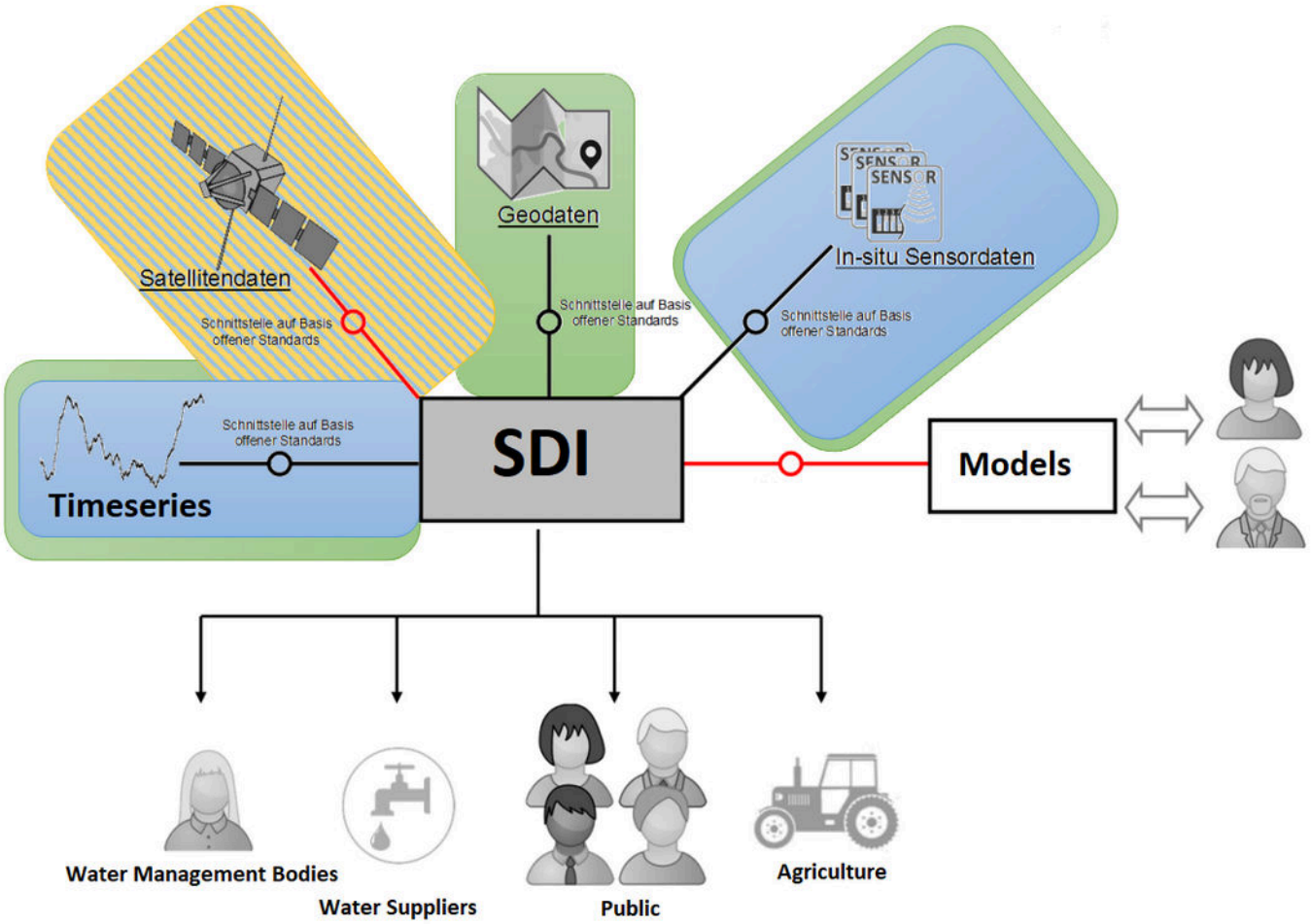
WaCoDiS

WaCoDiS

- Goals
  - Identify relevant spots (e.g. where cattle herds pollute drainage channels)
  - Allow individual consulting of farms (better crop rotation to decrease erosion)
- Increase environmental monitoring efficiency by combining various spatial data, sensor data and model components in order to
  - Set up dynamic catchment area maps (vitality of vegetal cover, actual crop rotation, land use etc.) based on Copernicus data (high temporal resolution)
  - Optimize models for sediment and material inputs in watercourses and dams
  - Quantify and geo-locate sediment and material inputs

WaCoDiS


Satellitendaten
Schnittstelle auf Basis offener Standards
Geodaten
Schnittstelle auf Basis offener Standards
In-situ Sensordaten
Schnittstelle auf Basis offener Standards
Timeseries
Schnittstelle auf Basis offener Standards
SDI
Models
Water Management Bodies
Water Suppliers
Public
Agriculture

SenSituMon

Integration of satellite and in-situ data to improve the automatic monitoring of large scale flooding areas

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con·terra

MuDak-WRM

WaCoDiS

SenSituMon

- Combination of in-situ and EO-data
- Cloud/Big Data infrastructure
- Efficient processing/streaming of large data sets
- Usage of machine learning approaches
- Extension/applicability of standards

Summary

- Three different projects
- Recently started
- MuDaK-WRM
  - Improve monitoring of water quality on reservoirs on a global level
  - Remote sensing data as proxy for in-situ measurements
- WaCoDiS
  - Monitoring of material inputs in watercourses and dams
  - Regional focus
  - Combination of in-situ and remote sensing data
- SenSituMon
  - Large-scale flooding events
  - In-situ and remote sensing data as complementary resources
  - Big data and machine learning technologies

Thank You for Your Attention!

Further Information:

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https://52north.org/conference