Helmholtz Water Safety and Security Challenge // Solution Labs

Solution Lab Rur-Erft

KA4-WSSC-02

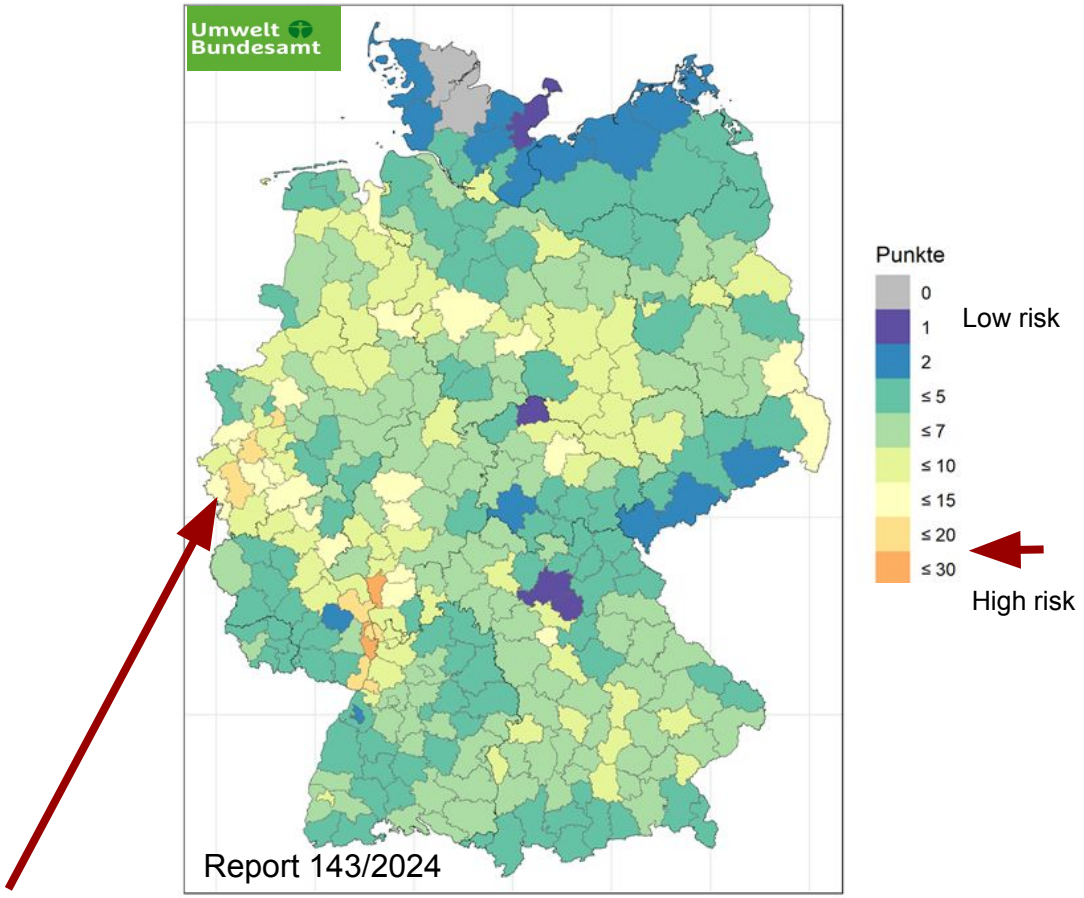
Rur-Erft catchments | Forschungszentrum Jülich GmbH | Contact: Stefan Kollet (s.kollet@fz-juelich.de)

Helmholtz-Zentrum für Geoforschung | Karlsruhe Institut für Technologie | Helmholtz-Zentrum für Umweltforschung GmbH

The Challenge

- Tackle the challenge of ***too much water but often not enough*** in a **transfer by design** approach in the theme **Terrestrial Water Cycle**.
- Specific goals:
  - Implement the Solution Lab in the **Rur-Erft catchment**, one of the TERENO sites, with stakeholders and industry partners.
  - Implement transfer by design approach in the form of **Interactive Solution Rooms** for a novel type of interaction with stakeholders for effective identification of solutions.
  - Transfer and establish the **approach beyond the Rur Erft catchment**.
- Cross-cutting topics covered: Monitoring, remote sensing and sensor technology; digitalization, information technologies, data analysis; synthesis, knowledge transfer and implementation

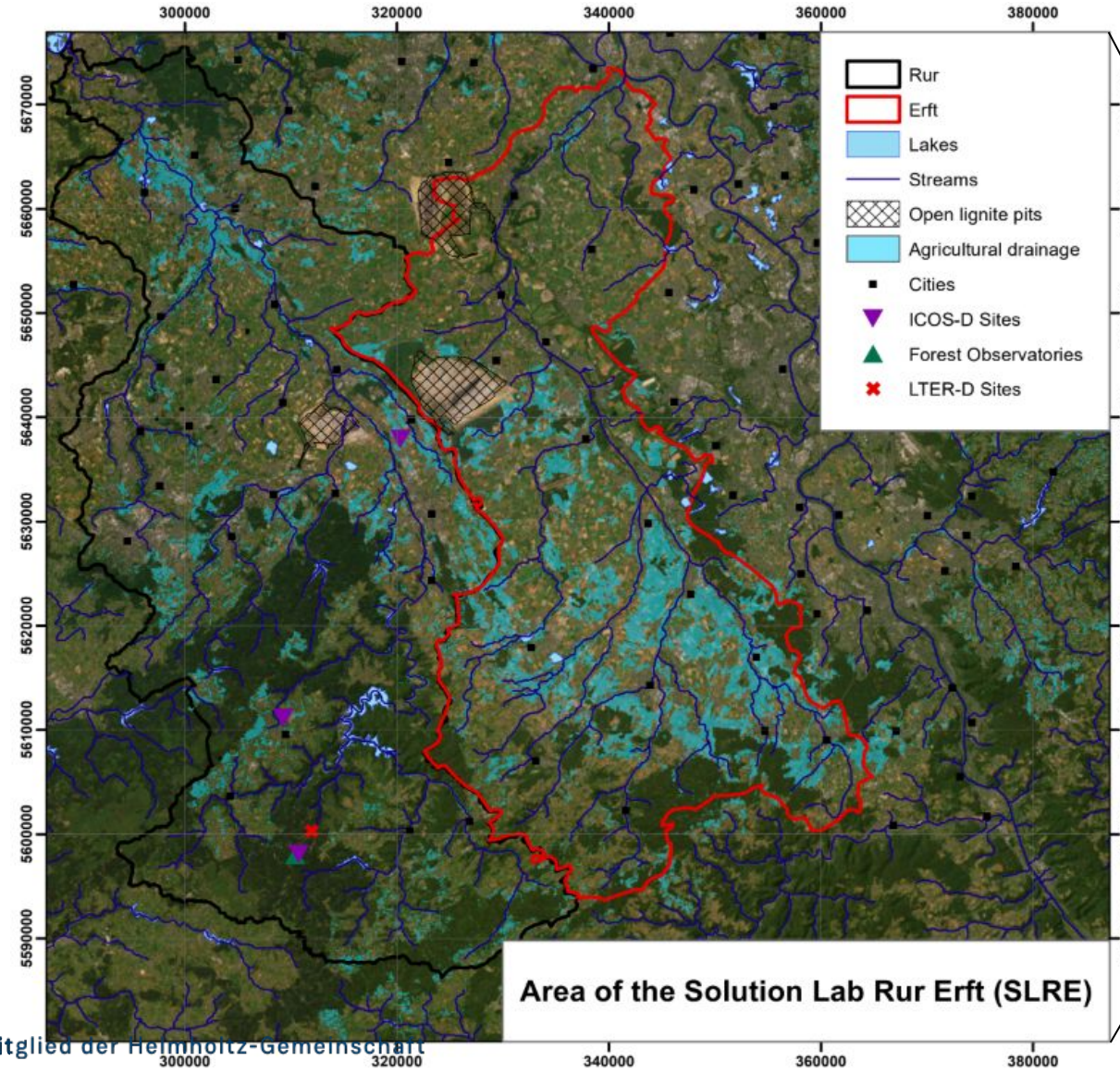
The Challenge

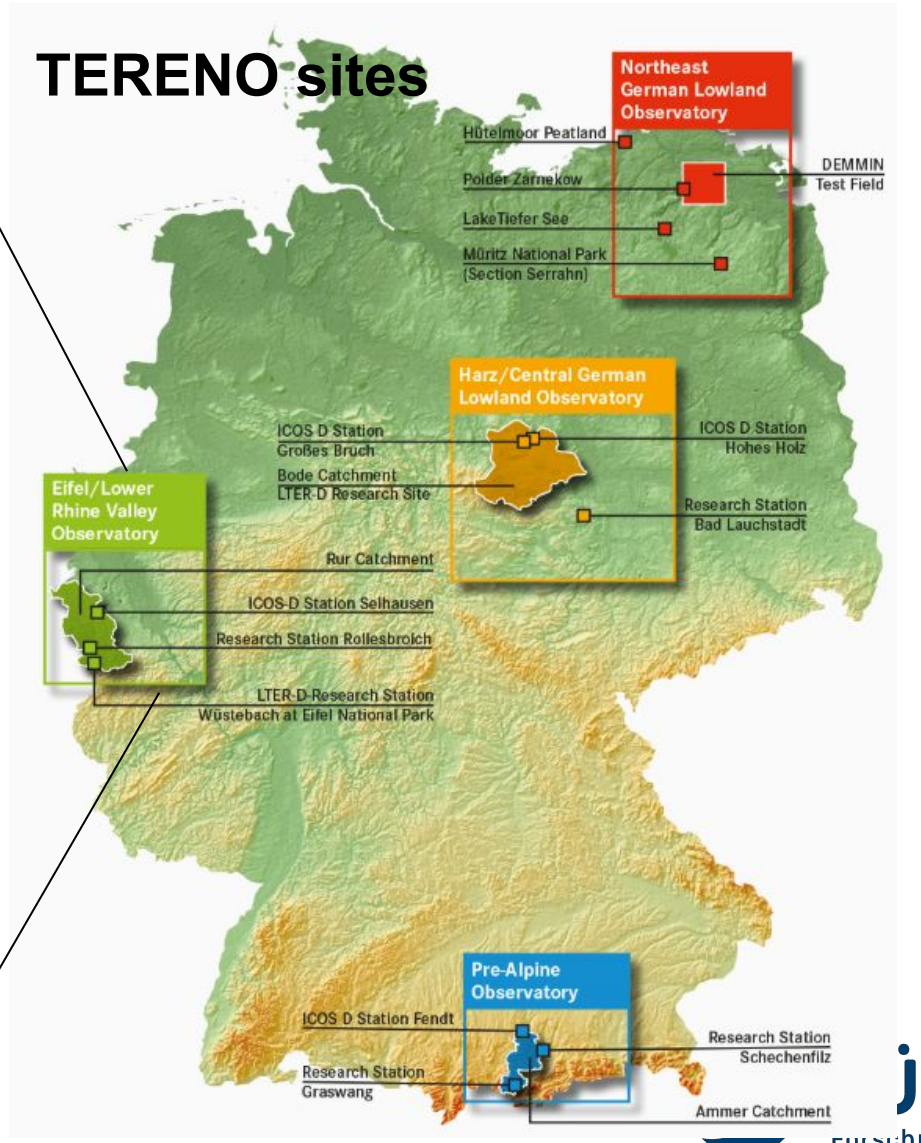


- High population, highly developed industries and intensive agriculture competing for water resources.
- Damages caused by floods and droughts must be prevented or at least mitigated.
- Impacts of lignite mining on land surface and groundwater resources must be overcome.
- Developing conflicts in context of water use must be resolved.
- Strategies for future conflict-free water distribution must be developed and evaluated.

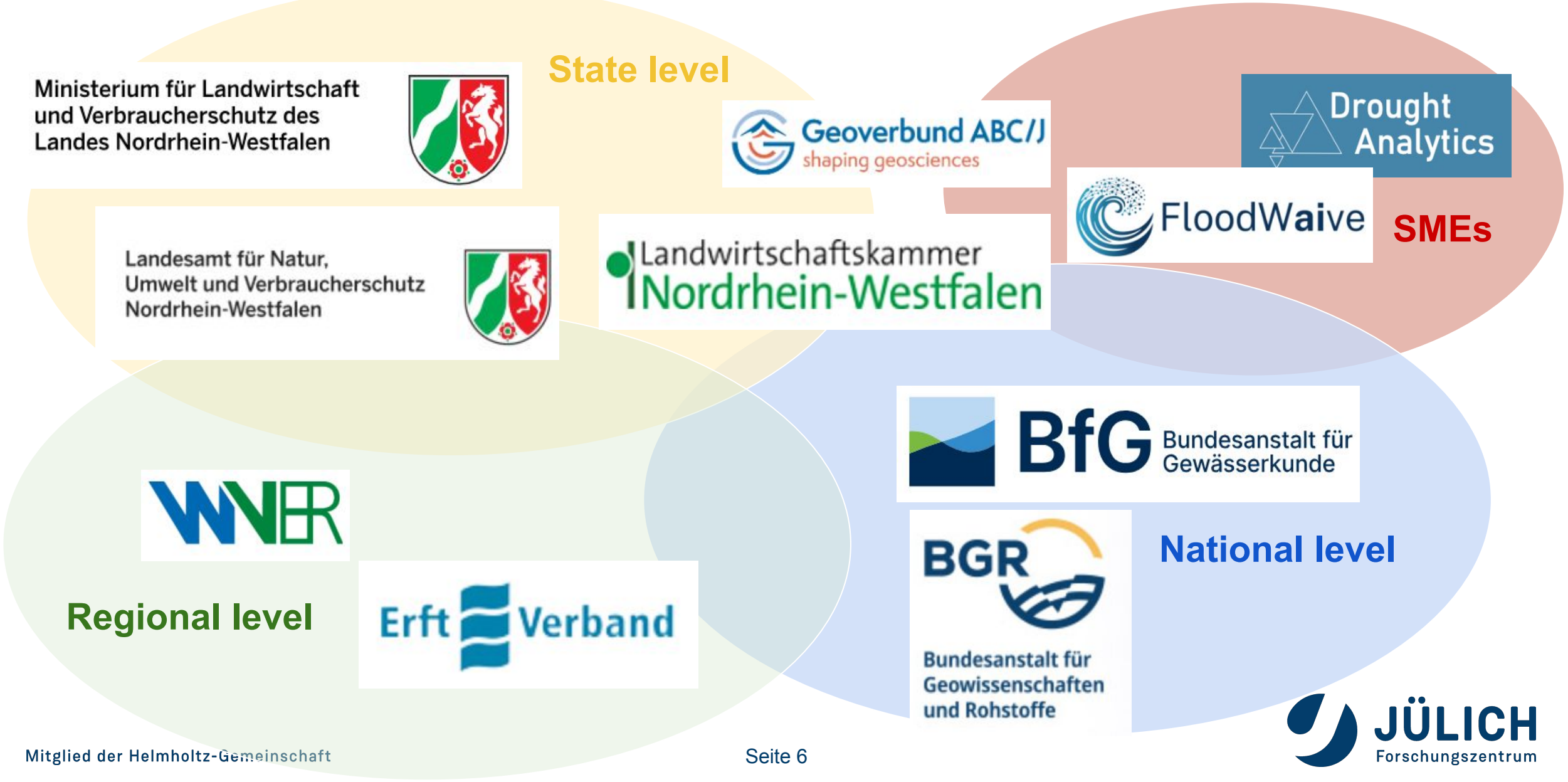
The SLRE location is one of the "water-balance-at-risk areas" in Germany

The Lab: Location



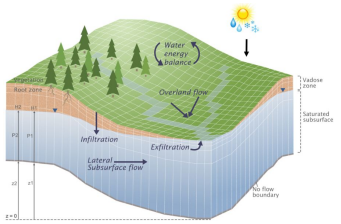


The Lab: Stakeholders at the center of SLRE



The Lab: Implementation

GFZ Helmholtz-Zentrum für Geoforschung
JÜLICH Forschungszentrum
KIT 200 JAHRE
UFZ HELMHOLTZ Zentrum für Umweltforschung
FloodWaive
Drought Analytics
Landwirtschaftskammer Nordrhein-Westfalen
Erft Verband
WVER
BfG Bundesanstalt für Gewässerkunde
BGR Bundesanstalt für Geowissenschaften und Rohstoffe
Ministerium für Landwirtschaft und Verbraucherschutz des Landes Nordrhein-Westfalen
Landesamt für Natur, Umwelt und Verbraucherschutz Nordrhein-Westfalen



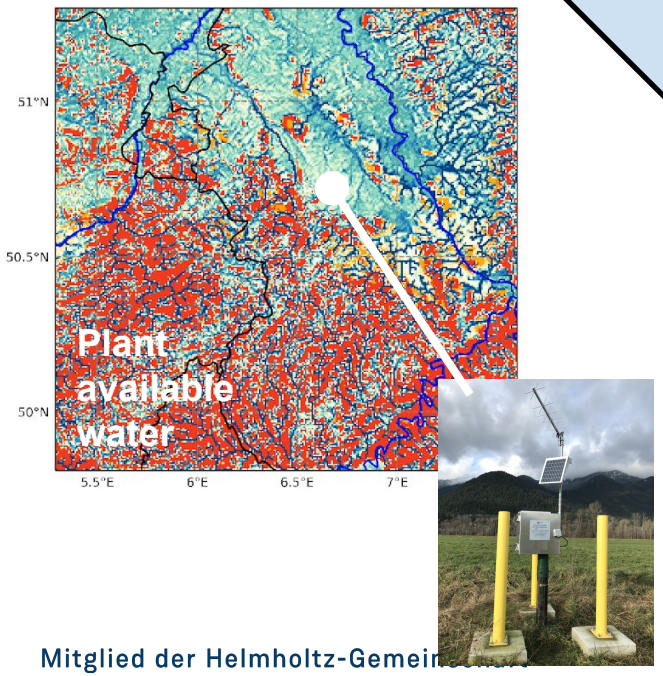
System Knowledge
Stakeholder
Hydro-Economics
Digital Twin RurErft
Emulators
(WP1)

Storylines

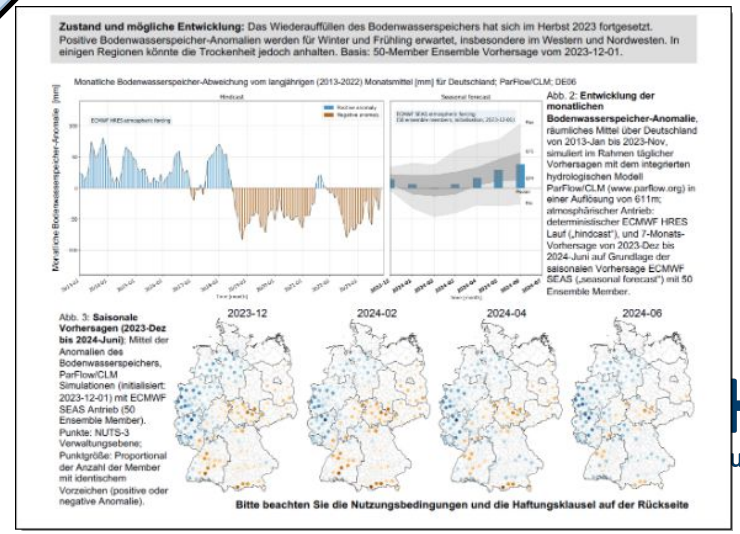
WP3

Target Knowledge
Stakeholder
Hydro-Economics
Climate information
(WP2)

Digital Twin



Transformation Knowledge
Outcome Interactive Rooms
Storyline Analysis Results
Solution spaces
Transfer across Germany+
(WP4 and WP5)



The Impact: Cascading beyond SLRE

Knowledge comes out of this room

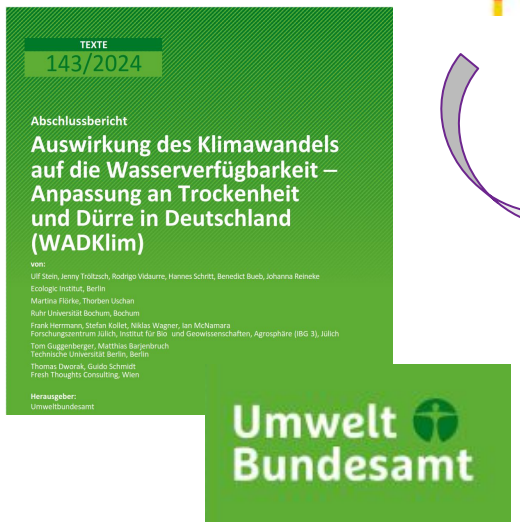
STARS 4 Water

WASSER Bund/Länder-Arbeitsgemeinschaft Wasser (LAWA)
Die Nationale Strategie

Bundesministerium
für Umwelt, Naturschutz, nukleare Sicherheit
und Verbraucherschutz

Water Framework Directive

European Commission | European Drinking Water Directive (DWD) and Harmonized Standards



Consortium

- Target and System Knowledge: Stakeholder collaborations (FZJ, GFZ, KIT, UFZ)
  Unique: established over years to decades
- Digital Twin (FZJ, GFZ, KIT, UFZ)
  Unique: from groundwater into the atmosphere, quasi-operational implementation
- AI technologies (KIT)
  Unique: foundation models
- Hydro-economics (UFZ)
  Unique: agent based modeling
- HPC technologies, JUPITER-certified (FZJ)
- Areal transferability, cascading impacts, sustainability (FZJ, GFZ, KIT, UFZ)

Subprojects: work towards the same goal, clearly distinguishable, able to carry out their work independently

SP1
Digital Twin - Development of the digital twin of the Rur/Erft catchment

SP2
Stakeholders and industry partners: Define and implement storylines

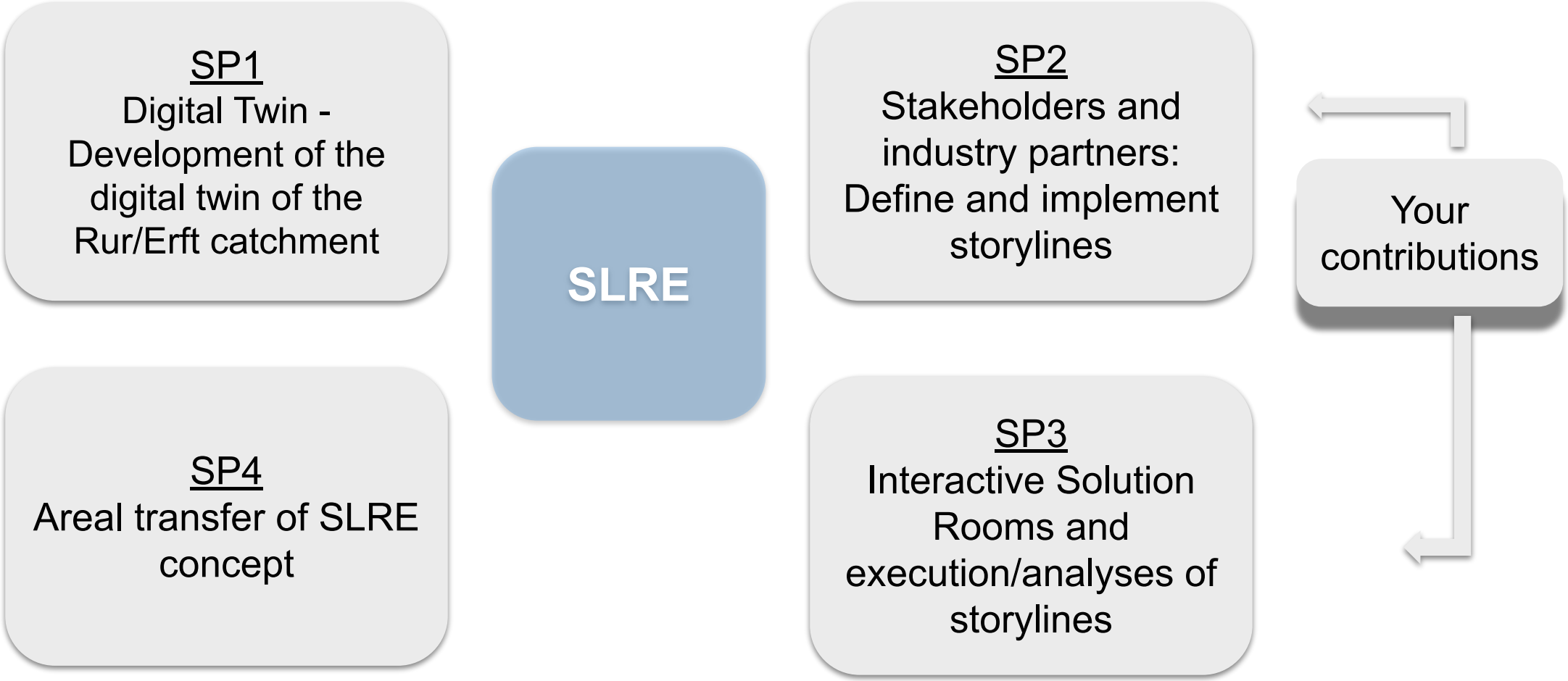
SLRE

SP4
Areal transfer of SLRE concept

SP3
Interactive Solution Rooms and execution/analyses of storylines

Note: SP titles and numbering may still change.

Subprojects: work towards the same goal, clearly distinguishable, able to carry out their work independently



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Subprojects: work towards the same goal, clearly distinguishable, able to carry out their work independently

SP1
Digital Twin - Development of the digital twin of the Rur/Erft catchment

SP2
Stakeholders and industry partners: Define and implement storylines

SLRE

SP4
Areal transfer of SLRE concept

SP
Your sub-project

SP3
Interactive Solution Rooms and execution/analyses of storylines

Note: SP titles and numbering may still cha

Next steps and criteria

Next steps

1. Talk to us as soon as possible (s.kollet@fz-juelich.de)
2. Meet the consortium
3. Provide a *one-pager* on your potential contribution

Criteria

- Contribution to SP(s): Work towards the SLRE goals and novelty
- New SP: Work towards the SLRE goals and novelty, clearly distinguishable from other SPs, able to carry out the work independently

Decisions need to be reached by the end of May!