

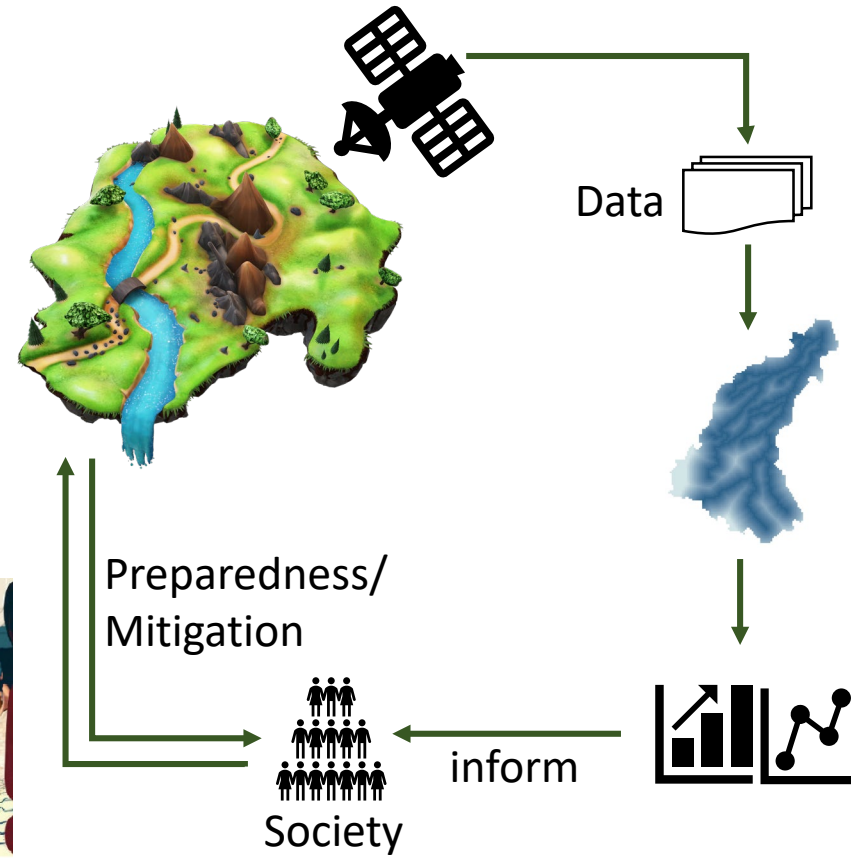
Web application for supporting assessment of climate change adaptation strategies in Aa of Weerij's catchment, the Netherlands

Andreja Jonoski, **M. Hairs Ali**, Claudia Bertini, Ioana Popescu and Schalk Jan van Andel
IHE Delft, Institute for Water Education & TU Delft, Netherlands
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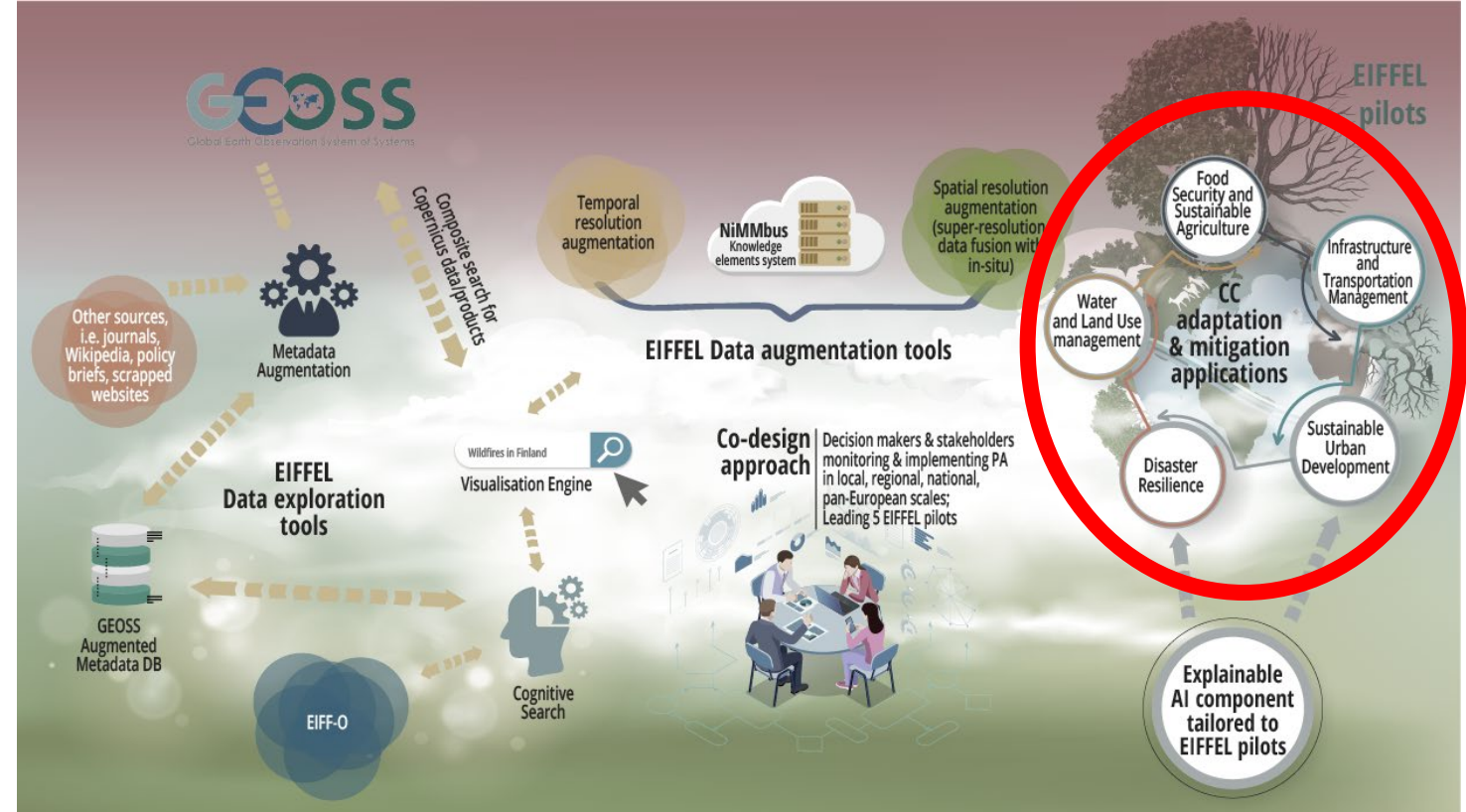
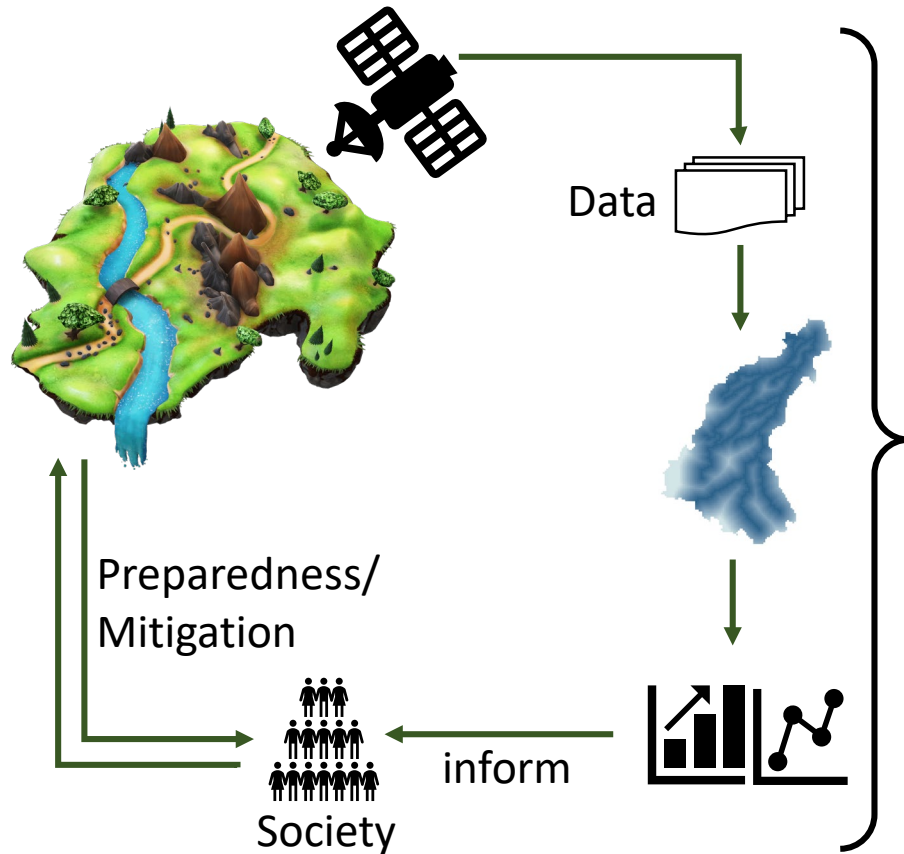


M. Hairs Ali , h.ali@un-ihe.org

Introduction and background



Introduction and background



Revealing the role of GEOSS for building climate change adaptation & mitigation applications.

Global dataset

Hydrological Model

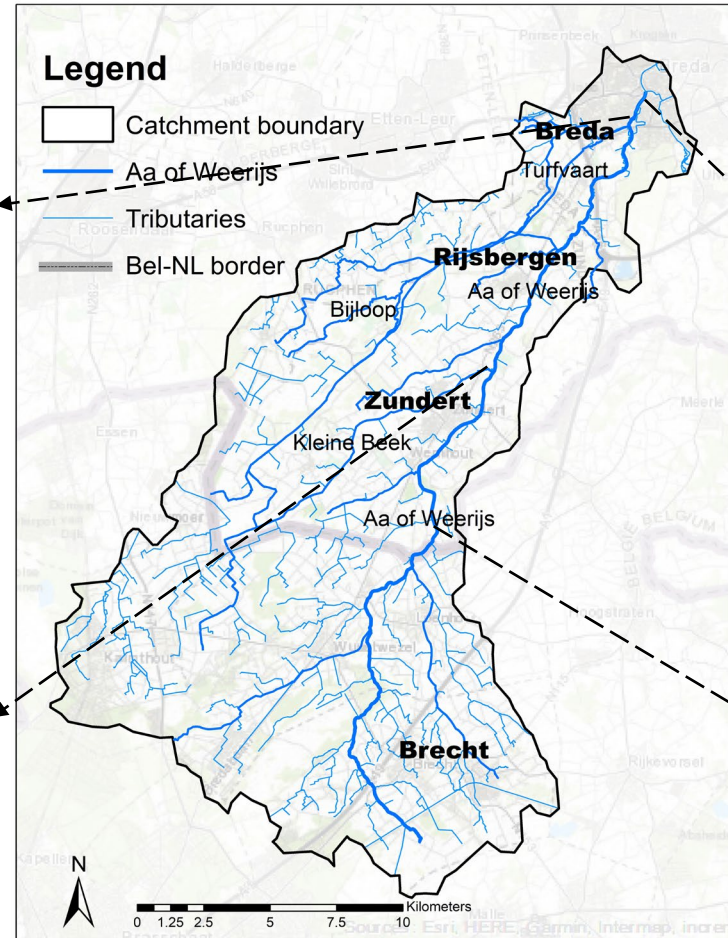
Climate change

Nature based solutions



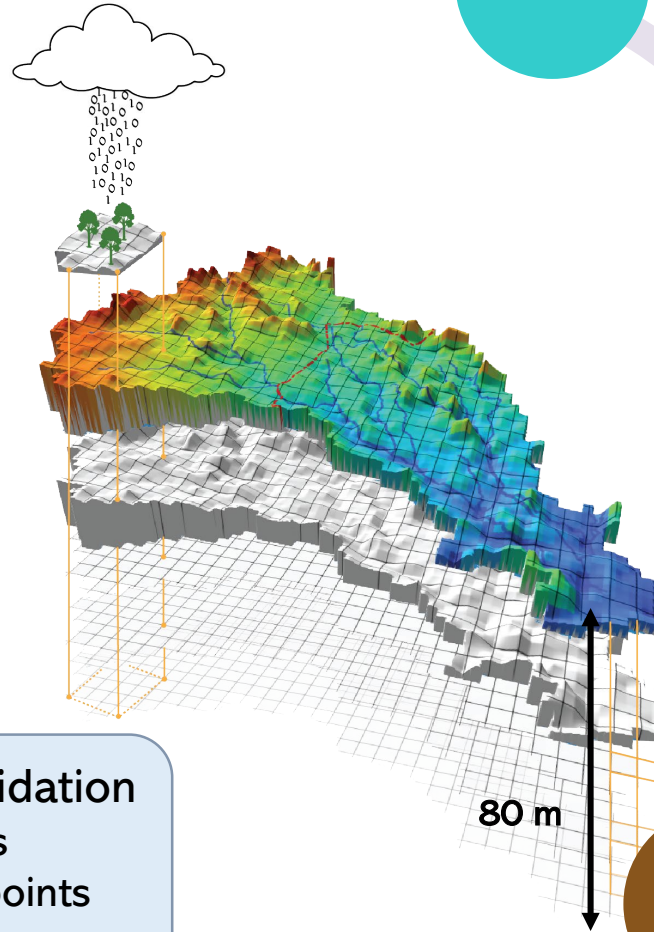
Study area: Aa of Weerij's Catchment

- Source: Brecht, Belgium
- Outlet: Breda, Netherlands
- Total Area: 346 km²
 - Netherlands: 147 km²
 - Belgium: 199 km²
- Major land use is agriculture



Hydrological model

Fully distributed
MIKE-SHE



Calibration and validation

- 3 discharge points
- 13 groundwater points
- 2009-2019

Potential EvapoTranspiration (PET)

- Uniformly distributed
- In-situ measurements in one location



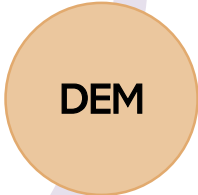
Rainfall

- Thiessen polygons
- In-situ measurements at three locations



Land Use/Land Cover (LULC)

- Corine CLC 2018
- LAI and root depth**
- crop parameters by NHI



Topography

- EU DEM
- River Network (Mike 11)**
- 7 automated weirs
- 22 fixed weirs



Soil Distribution Map

- ESDAC (LUCAS Top soil physical properties)
- Richard's equation method**
- Hydraulic soil properties**
- Van Genuchten method equations

Climate change scenarios

➤ KNMI '23 Climate Change (CC) scenarios: IPCC6 scenarios downscaled for the Netherlands by the Dutch meteorological institute (KNMI)



Nature-based Solutions

Ditch blocking



Infiltration ponds



Tree planting



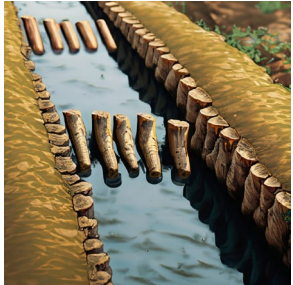
Wetlands restoration



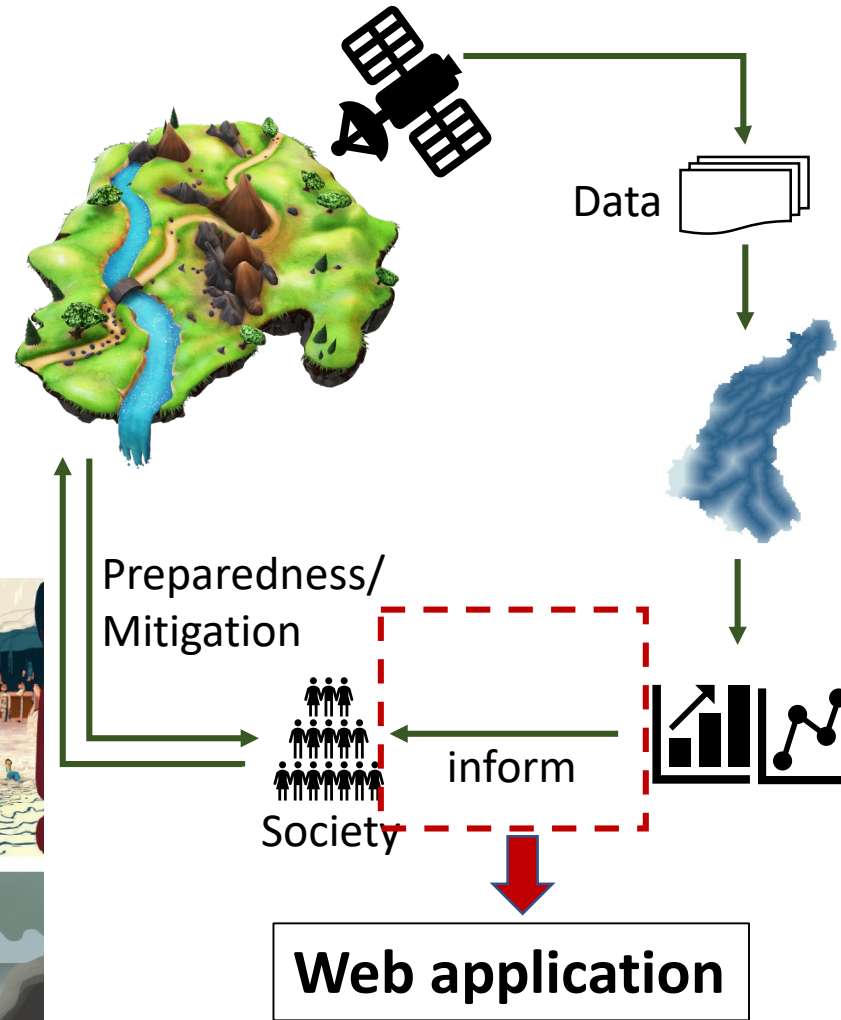
Heathland restoration



Brook bed barriers



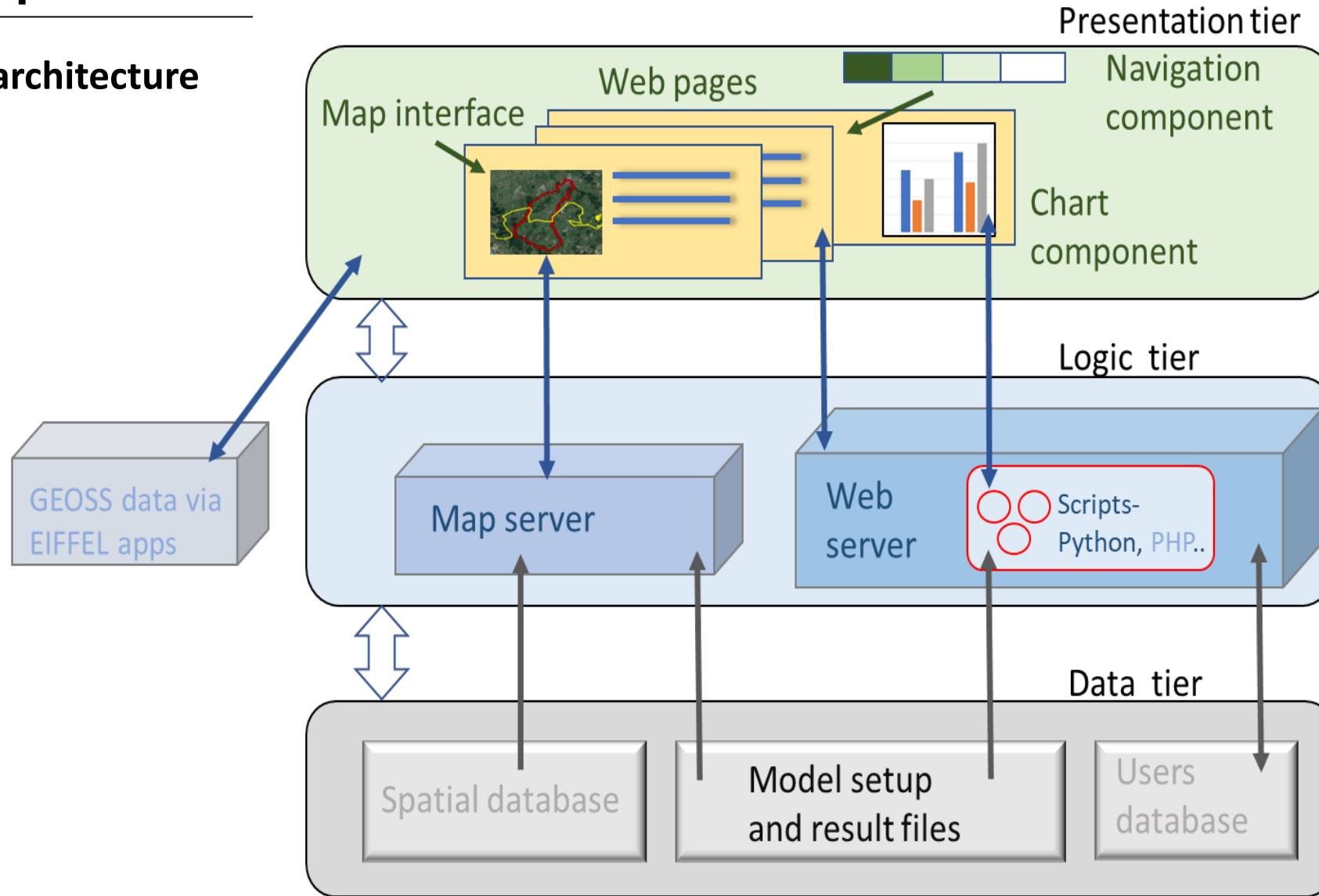
Web application



- Support tool for CC assessment
- Co-design with stakeholders
- Information dissemination from un-structured to organised manner

Web application

- 3-tier architecture



Web application

- Human computer interactions (HCI) and user experience (UX) principles

(Whitney et al., 2023)

The screenshot shows the 'Eiffel' web application interface. The header includes the logo and navigation tabs: 'Introduction', 'Models and data', 'CC scenarios', 'NBSs', 'KPIs' (selected), and 'Adaptation strategies'. The main content area is titled 'Key Performance Indicators' and contains a paragraph explaining their purpose. Below the text are three buttons: 'Surface Water Availability (SWA)', 'Groundwater Availability (GWA)', and 'Soil Moisture Index (SMI)'.

- Information architecture

- Pre-attentive processes and attention
- Principle of Appropriate Knowledge
- Progressive disclosure

The screenshot shows the 'Eiffel' web application interface with the 'Models and data' tab selected. It features a 'Model description' section and a 'Model inputs and results (examples)' section. On the left, there is a 'Select datasets' button and a 'Time series ON' button. The main area displays a map of the region with a grid overlay. A pop-up window titled 'head elevation in saturated zone' shows a line graph of groundwater head elevation over time. To the right of the map is a legend for 'Groundwater head elevation in 2018 (mamsl)' with a color scale from red (-0.2 - 0.9) to blue (21.1 - 22.2).

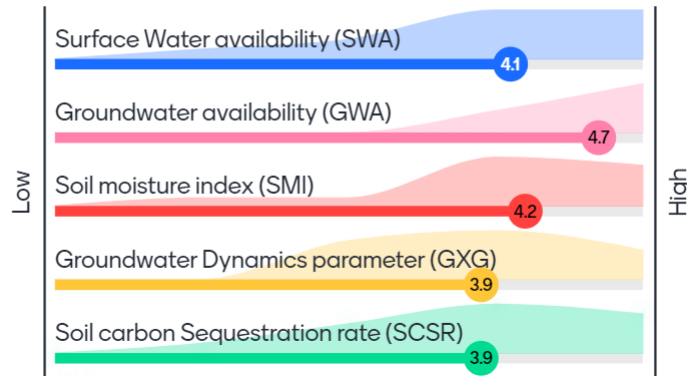
- Interaction design
- Visual encoding

Web application

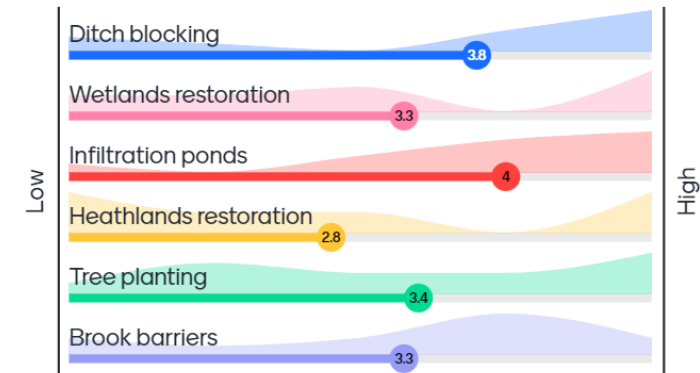
- **User-centered design:** An iterative cycle of product development and end-user evaluation

Stakeholder workshops and in-process meetings

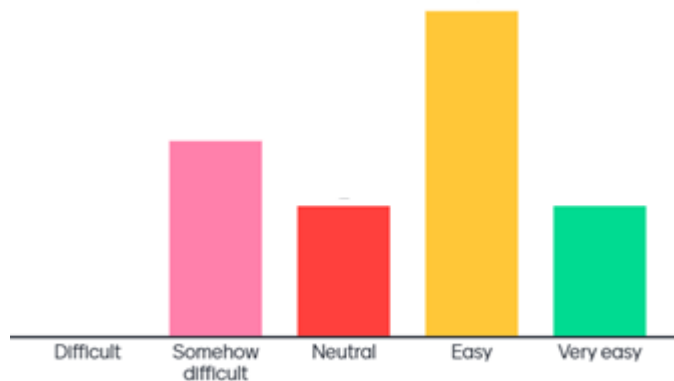
Please score the importance of the KPIs



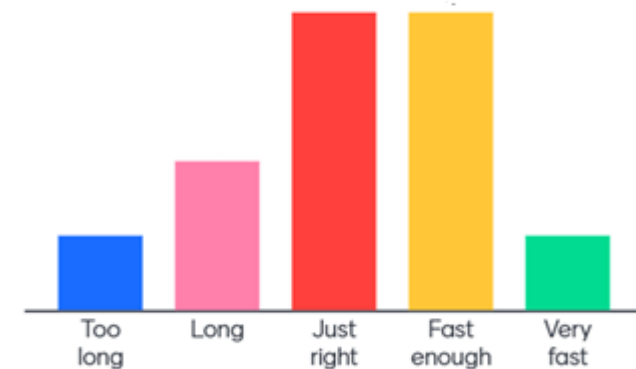
Could you please score the proposed NBSs in terms of feasibility in your region ?



Could you please score the ease of use of web application.



Could you please score the time needed to assess the effectiveness of a given NBSs adaptation strategy in the web app?



In a nutshell



Methodological validation
Web app improvement
Societal relevance



<https://eiffel.un-ihe.org/EIFFEL-prod/index.html>

Thankyou



M. Haris Ali , h.ali@un-ihe.org



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