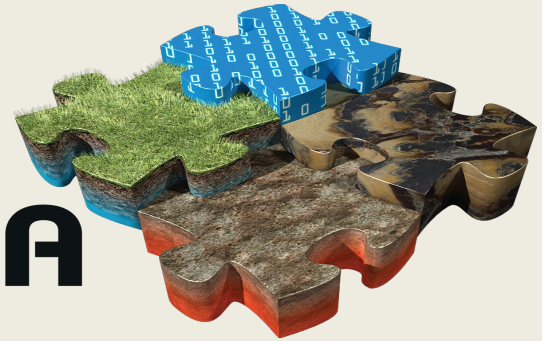
Innovation Fund Denmark

EuroGeoSurveys
European Geoscience for Society
The Geological Surveys of Europe

GeoERA



Integrated and sustainable use of the subsurface

introducing the contributions of the four GeoERA groundwater projects to the European Geological Data Infrastructure

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Laurence Gourcy (BRGM), Hans Peter Broers (TNO), Anker L. Højberg, (GEUS), Marco Bianchi (BGS) and Rob Ward (BGS)

on behalf of the GeoERA Groundwater TEAM

Webpresentation D701 for EGU 2020,
session ERE1.2, 8.5.2020

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GeoERA GROUNDWATER

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1. Sustainable use of the subsurface and the need for a common geoscience information platform
2. Groundwater in the bigger picture
3. Brief introduction to the four GeoERA groundwater projects
4. FAIR* access to subsurface data

*Wilkinson et al., 2016. The FAIR Guiding Principles for scientific data management and stewardship. Sci Data 3, 160018.

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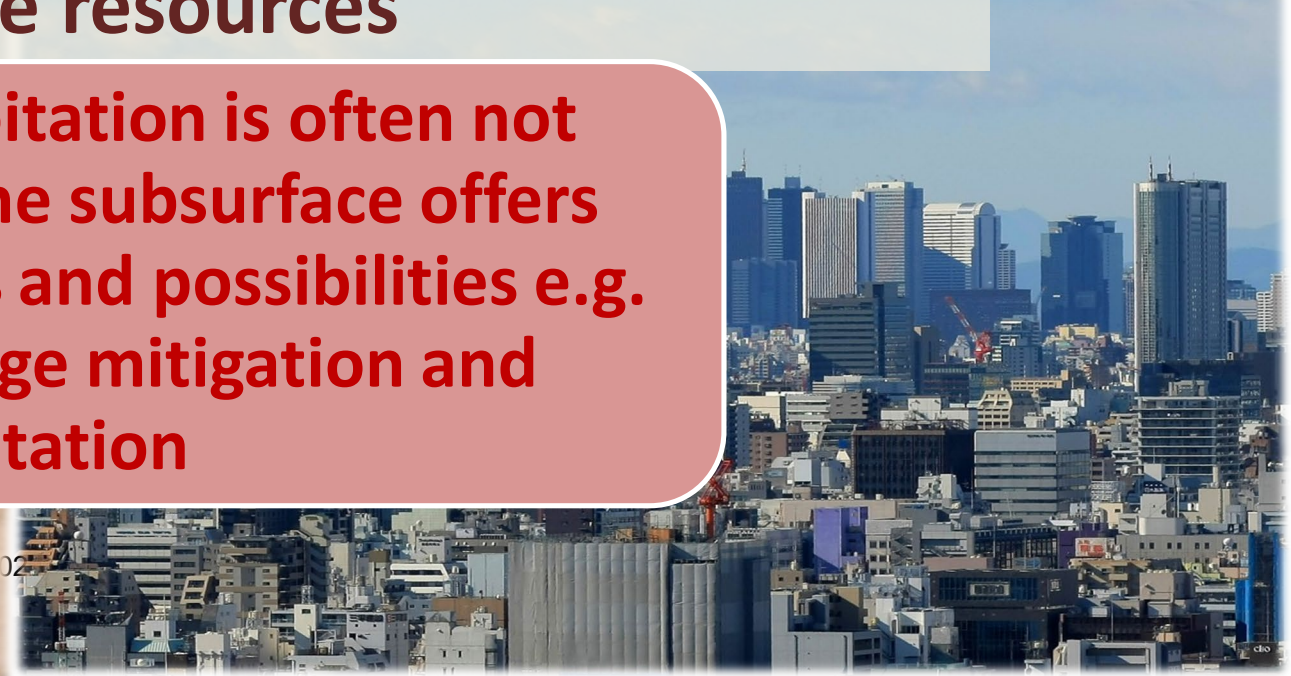
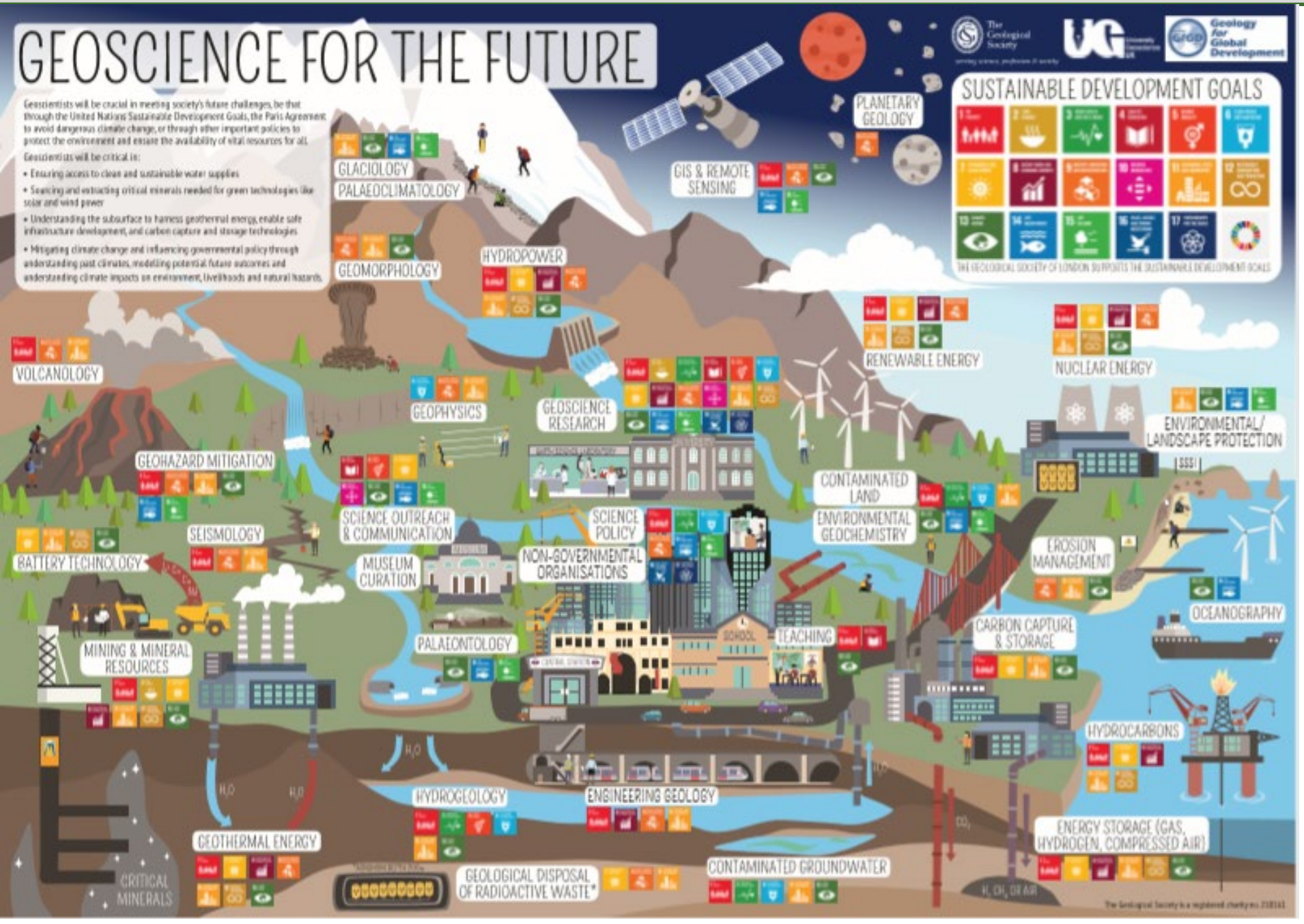
Courtesy: Christian Holmegaard Mossing /NIRAS

Modern societies are built and totally depend on subsurface resources

The current exploitation is often not sustainable, but the subsurface offers important solutions and possibilities e.g. for climate change mitigation and adaptation





TEXT ON POSTER from the Geological Society illustrating the importance of geology and the subsurface for achieving the UN SDGs:

”Geoscientists will be crucial in meeting socity’s future challenges, be that through the United Nations Sustainable Development Goals, the Paris Agreement to avoid dangerous climate change, or to other important policies to protect the environment and ensure the availability of vital resources for all.

Geoscientists will be critical in:

Ensuring access to clean and sustainable water supplies

Sourcing and extracting critical minerals for green technologies like solar and wind power

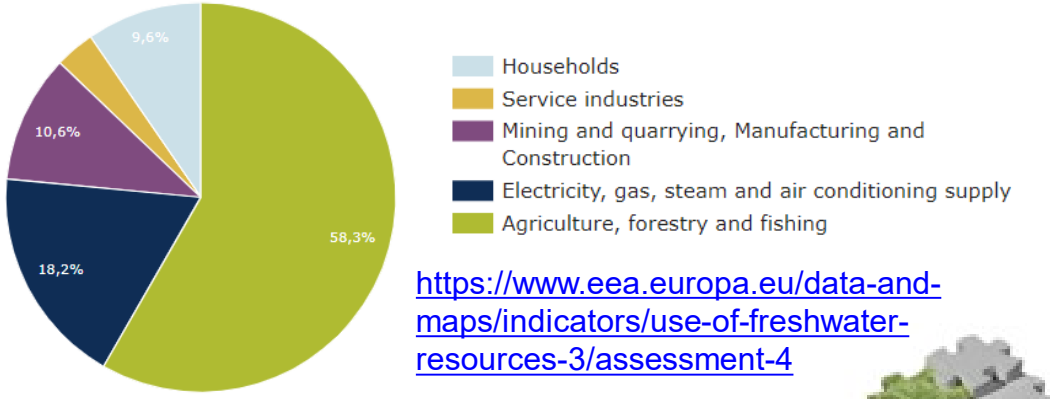
Understanding the subsurface to harness geothermal energy, enable safe infrastructure development, and carbon capture and storage technologies,

Mitigating climate change and influence governmental policy through understanding past climates, modelling potential future outcomes and understanding climate impacts on environment, livelihoods and natural hazards

Integrated, sustainable and just exploitation of water resources is required to meet the UN SDG's and "EU Green Deal" objectives

Sustainable management of water resources have implications and relevance for 12 out of 17 SDG's

Water use in Europe by economic sector, 2017



https://www.eea.europa.eu/data-and-maps/indicators/use-of-freshwater-resources-3/assessment-4

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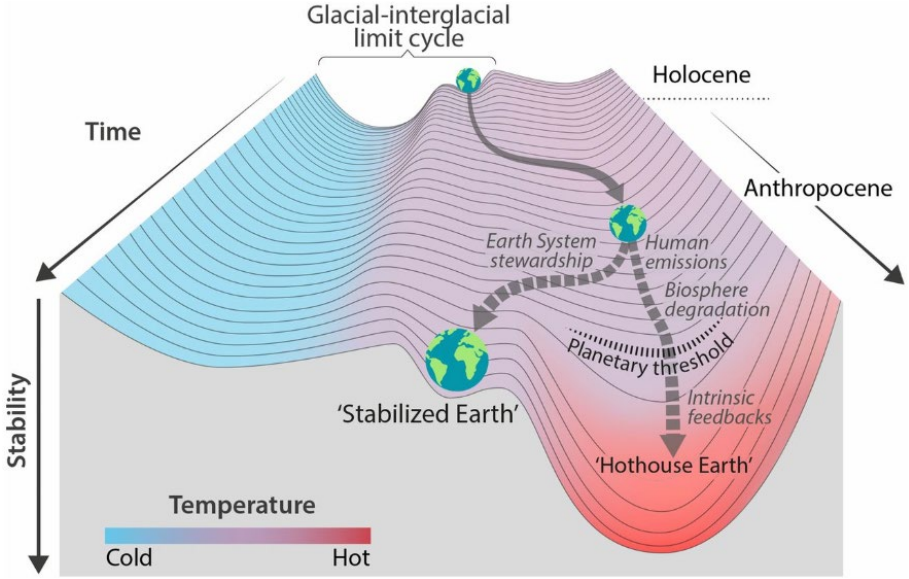
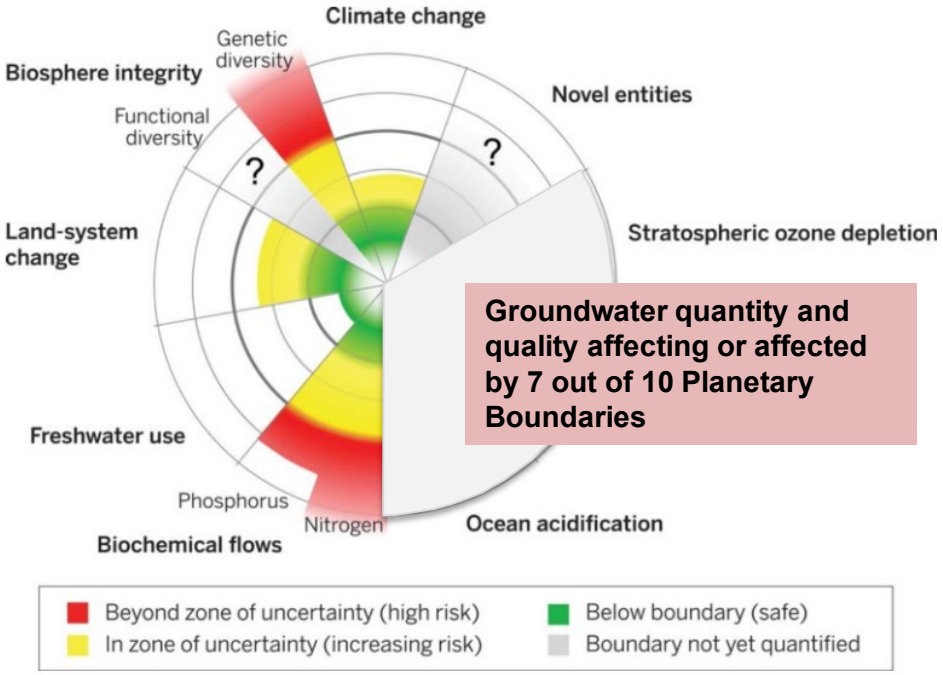
Planetary Boundaries and Thresholds affecting or affected by groundwater quantitative and chemical status



Steffen et al 2018. PNAS, 115, 8252-8259.



Groundwater quantity and quality affecting or affected by 7 out of 10 Planetary Boundaries

Steffen et al., 2015. Science 347, 1259855.

”About half of total greenhouse gas emissions and more than 90% of biodiversity loss and water stress come from resource extraction and processing of materials, fuels and food” – *The European Green Deal – COM (2019) 640 -* https://ec.europa.eu/info/sites/info/files/european-green-deal-communication_en.pdf

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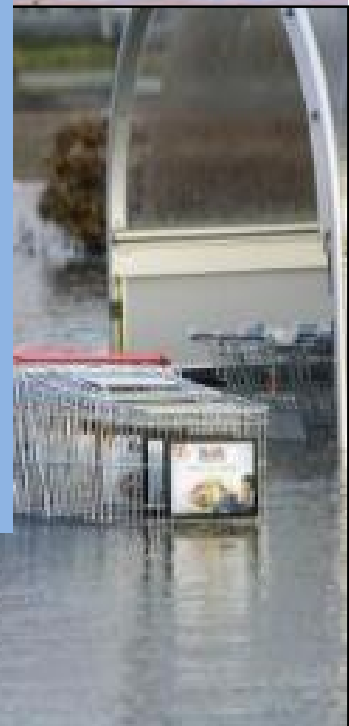
Mission of GeoERA groundwater projects

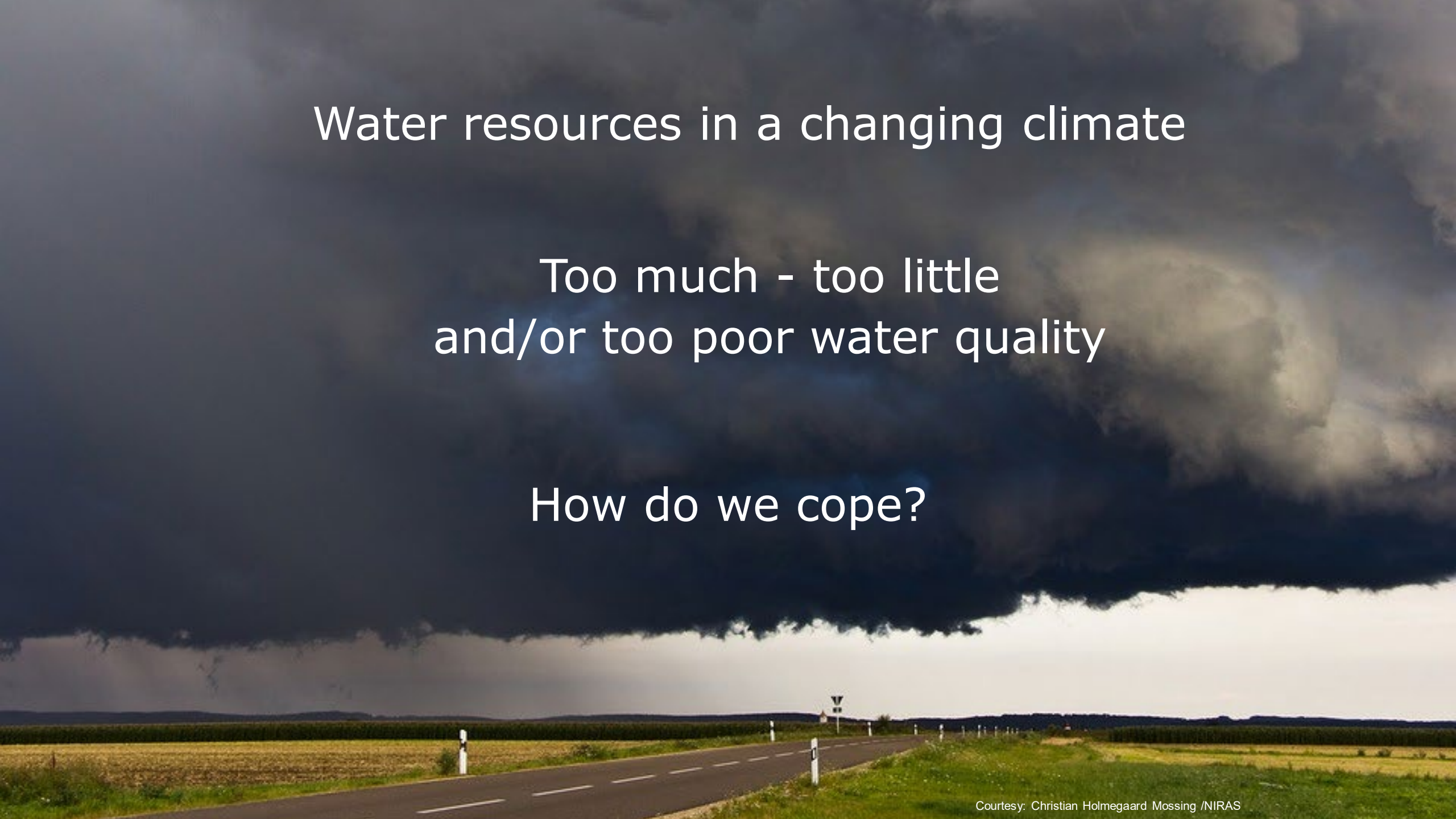
To provide data, information, research and decision-support tools for the long-term protection, sustainable management and improvement of groundwater resources across Europe and contribute to build resilient socities and implement EU policies e.g. the European Green Deal, and the Sustainable Development Goals of the United Nations



Water resources in a changing climate

Too much - too little
and/or too poor water quality

How do we cope?



Courtesy: Christian Holmegaard Mossing /NIRAS

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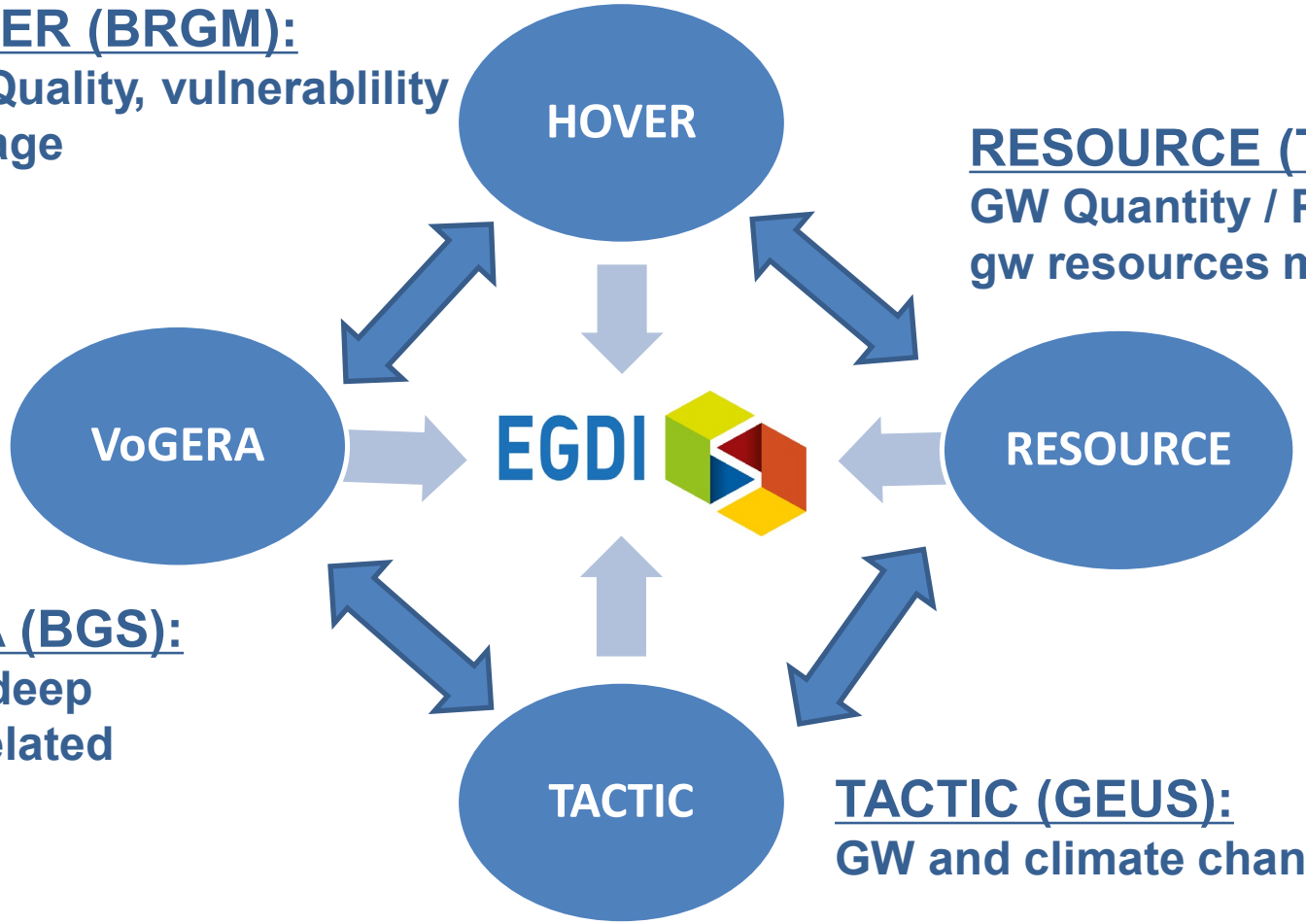
GeoERA groundwater:

the four groundwater projects and their main contributions to the GeoERA Information Platform / EGDI

HOVER (BRGM):
GW Quality, vulnerablility and age



RESOURCE (TNO):
GW Quantity / Pan EU gw resources map

VoGERA (BGS):
GW and deep energy related activities

TACTIC (GEUS):
GW and climate change

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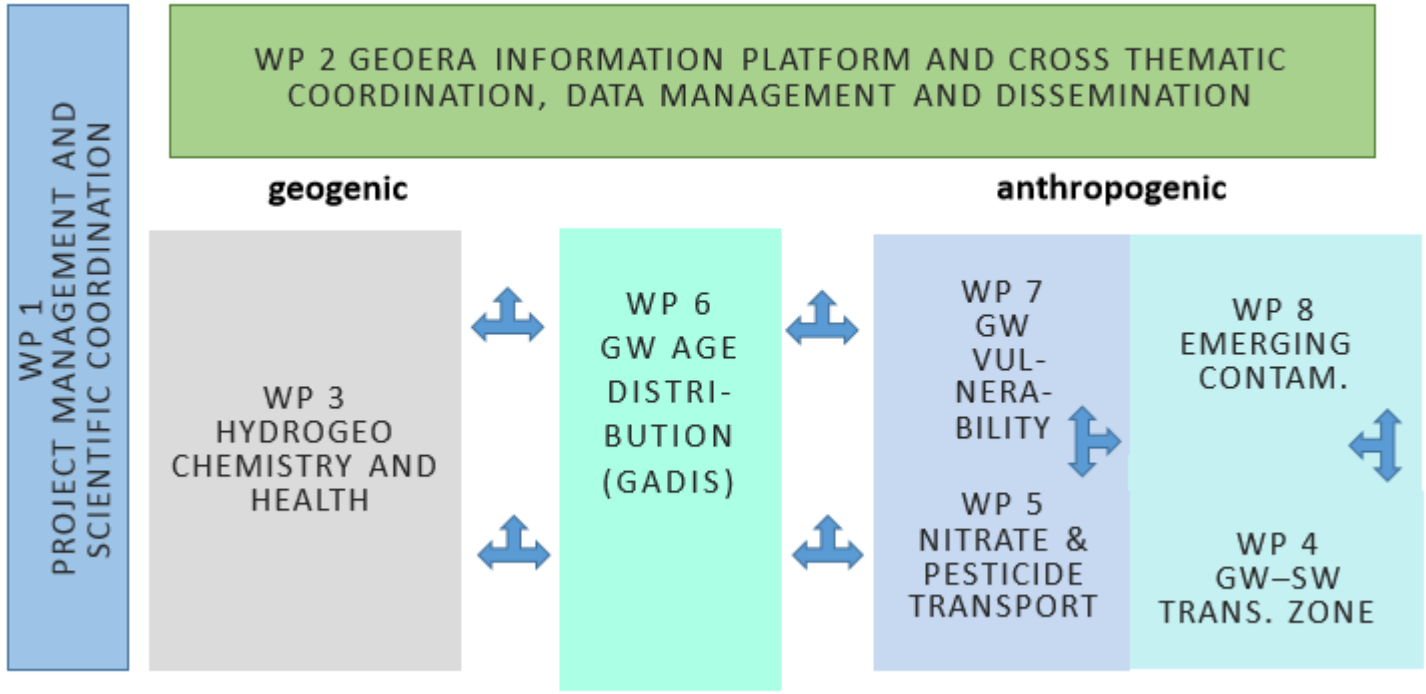
GeoERA GROUNDWATER

HOVER – Hydrogeological processes and geological settings over Europe controlling dissolved geogenic and anthropogenic elements in groundwater of relevance to human health and the status of dependent ecosystems

see additional presentation on HOVER WP7, D710, by Günther et al.



Project Manager: Laurence Gourcy (l.Gourcy@brgm.fr), BRGM

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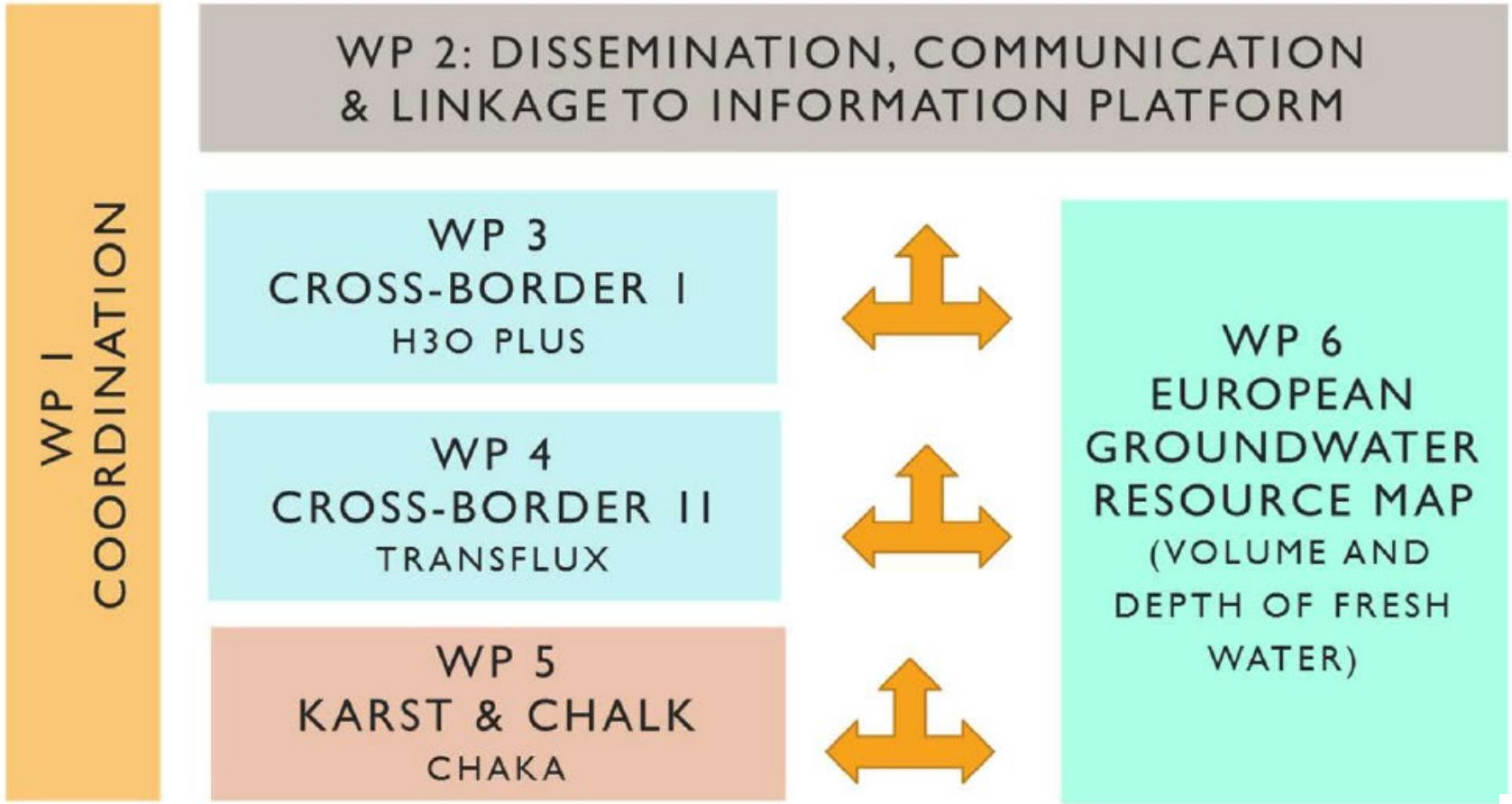
RESOURCE - Resources of groundwater, harmonized at Cross-Border and Pan-European Scale



Project Manager: Hans Peter Broers (hans-peter.broers@tno.nl), TNO

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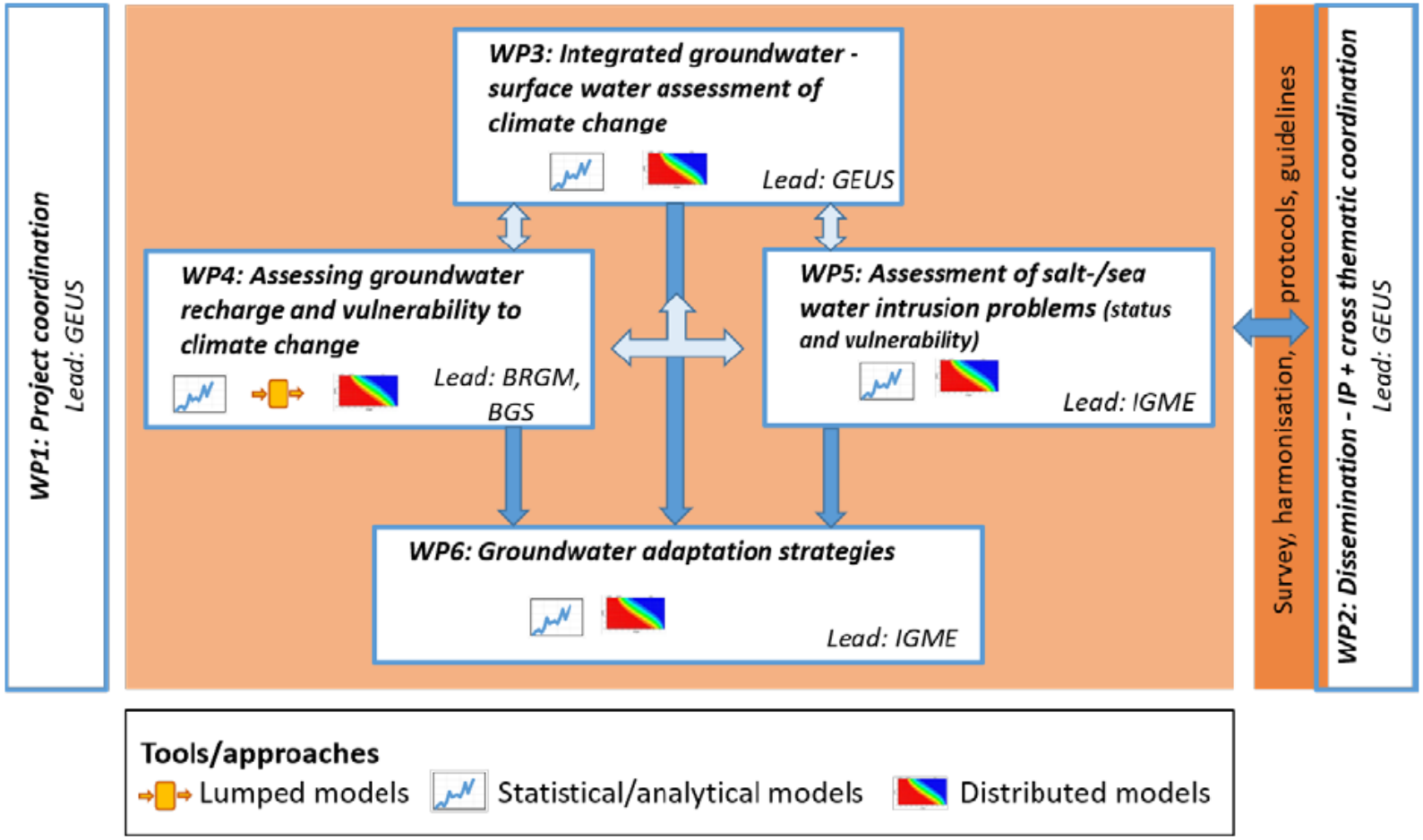
TACTIC – Tools for assessment of climate change impact on groundwater and adaptation strategies

see additional presentation D707 by Hojberg et al.



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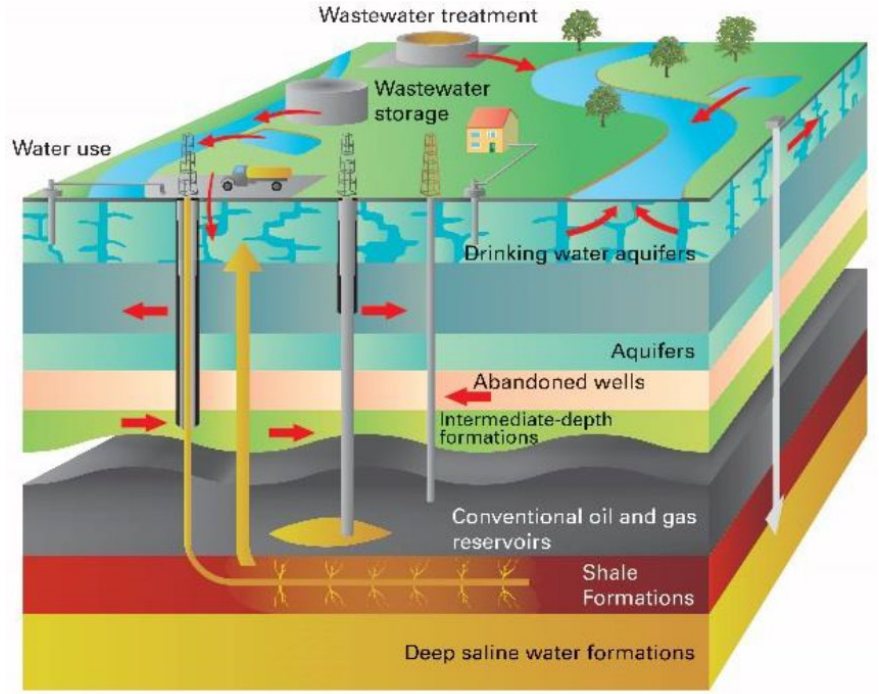
GeoERA GROUNDWATER

VoGERA - Vulnerability of Shallow Groundwater Resources to Deep Sub-surface Energy-Related Activities –

see additional presentation D709 by Ward et al.



WP 1
COORDINATION AND MANAGEMENT

WP 2: DISSEMINATION, COMMUNICATION & LINKAGE TO INFORMATION PLATFORM

WP 3
PROCESS UNDERSTANDING

WP 4
CONCEPTUAL FRAMEWORK FOR RISK CHARACTERIZATION

Project Manager: Marco Bianchi (marcob@bgs.ac.uk), BGS

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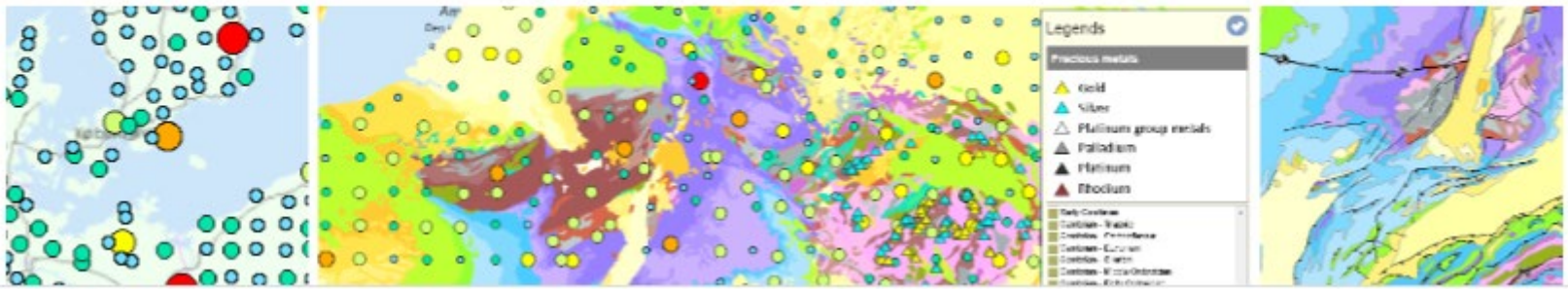
Sustainable development and use of the subsurface requires an *easy and FAIR* access to subsurface information and data –*

*FAIR = Findable, Accessible, Interoperable and Reusable
https://www.go-fair.org/fair-principles/
Wilkinson et al., 2016. The FAIR Guiding Principles for scientific data management and stewardship. Sci Data 3, 160018.

EGDI

Onshore Geology | Marine Geology | Mineral Resources | Geohazards | Energy | Soil | Groundwater | All Content | Metadata



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GeoERA

Thank you for your attention ☺

Please visit the GeoERA groundwater project websites at:
www.geoera.eu and EGDI: www.europe-geology.eu

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