

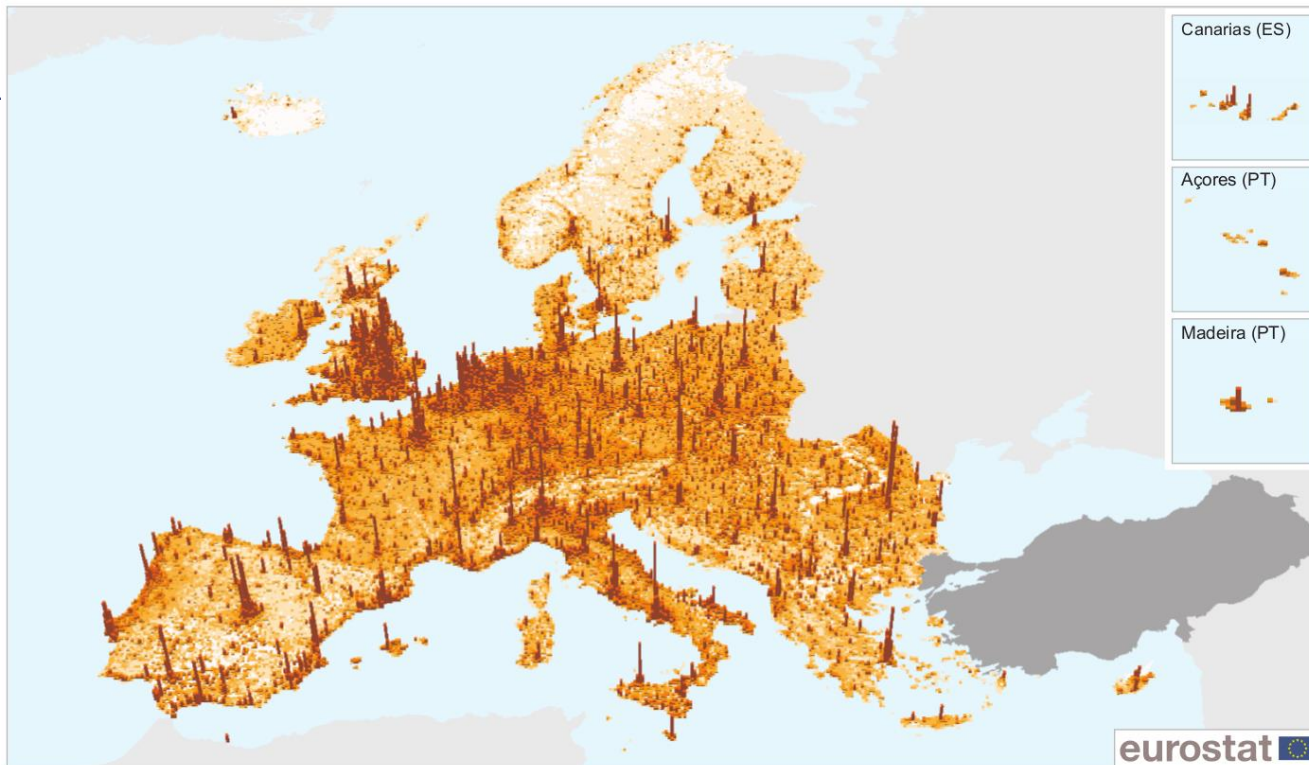
Lessons learned on salt water intrusion



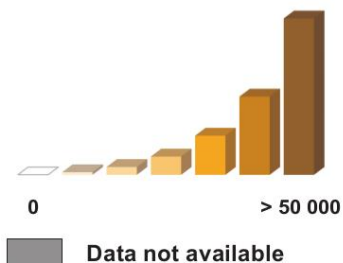
photographer: Yves Adams

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Population density based on the GEOSTAT population grid, 2011
 (number of inhabitants/10 km²)



(number of inhabitants/10 km²)



Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat
 Cartography: Eurostat — GISCO, 06/2017

Note: the GEOSTAT population grid is normally based on the number of inhabitants per 1 km²; for the sake of clarity in this 3D map it has been aggregated to show the number of inhabitants per 10 km². Guadeloupe (FRA1), Martinique (FRA2), Guyane (FRA3), La Réunion (FRA4) and Mayotte (FRA5): not available.

Source: JRC, Eurostat, GEOSTAT population grid 2011

Source: eurostat

What is salt water intrusion ?

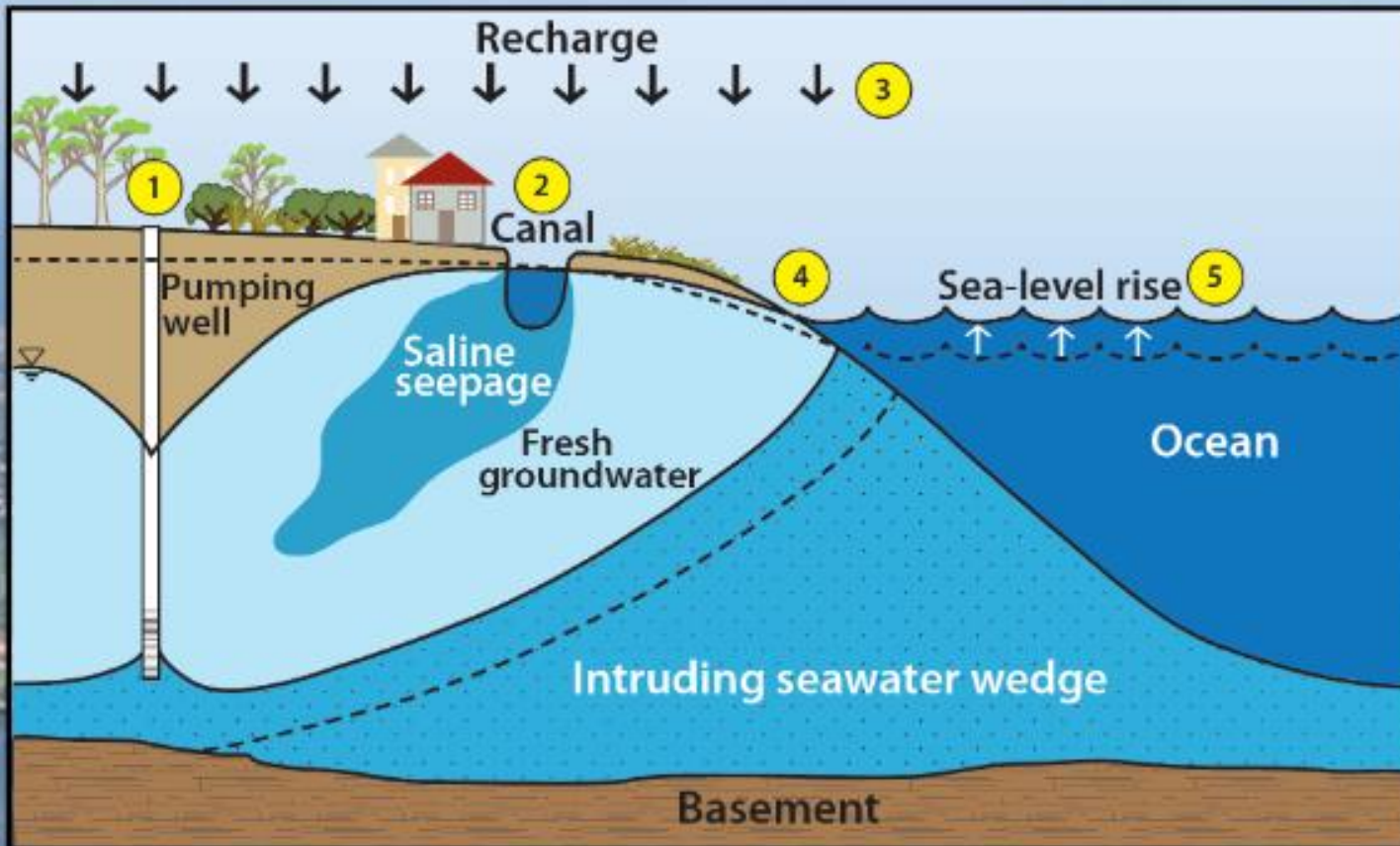
Salt water intrusion = the replacement of fresh groundwater by water that has a high salt content. Therefore salt water intrusion affects water quality and water usage.

The challenge is shared by the **coastal parts of the North Sea Region (NSR)**. It is investigated in the following pilots: [BE-1](#), [BE-2](#), [GE-1](#), [GE-2](#), [GE-3](#),

Mechanisms?



Seawater intrusion mechanisms



- Original condition
- Modified condition
- ① Excessive pumping
- ② Land-use change (e.g. canal development)

- ③ Reduction in recharge
- ④ Overtopping, caused by sea-level rise, storm surges, and tsunamis
- ⑤ Sea-level rise

"Understanding Seawater Intrusion" (Poster designed by Adrian D. Werner; Peta E. Jacobsen & Leanne K. Morgan)

What is the impact of salt water intrusion?

- Contamination of fresh groundwater resources → impact on access of fresh drinking water
 - Contamination of fresh surface water due to saline seepage → impact on surface water use (irrigation, drinking water, ecology, ...)
 - Deterioration of soil
 - Crop yield losses
- economic and social impact on rural and urban communities
- impact on the ecological health of streams



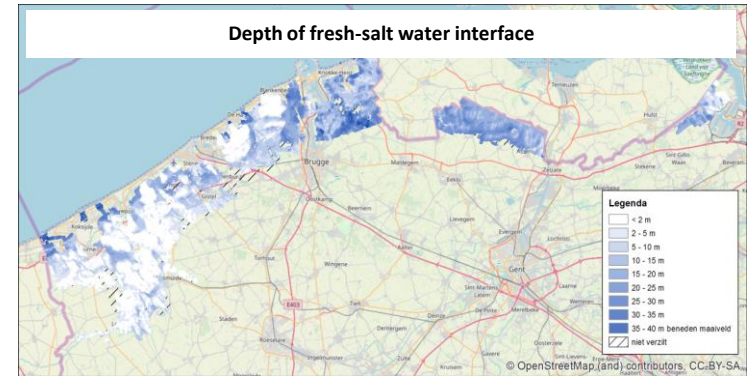
What are the most important aspects for successful climate change adaptation in groundwater management?

- **know the needs and concerns of your stakeholders** and involve them in decision making
- **Seek a win-win situation** for all parties (e.g. buffer excess of rainfall during winter for irrigation purposes during summer)
- **Think outside the box**, the problem and solution is often far wider than groundwater alone
- **Look beyond national borders**, different countries can have the same challenge but a different approach
- **Get it into the heads of policy makers**, by straightforward communication, by offering concrete measures as levers for a successful CC adaptation strategy



What are the most important aspects for successful climate change adaptation in groundwater management?

- **Invest in qualitative scientific research** for a better understanding of the current and future effects of CC, and the development of adaptation strategies
- **Lower the threshold for investors** by granting subsidies for CC adaptation projects
- **Convince policy makers and stakeholders by starting up a demonstration project**, people are more willing to invest when on-site projects give positive results



How can cooperation between regions as in the NSR programma support addressing the challenges?

By

- **connecting people** working in the same field and dealing with the same challenges
- **knowledge exchange**
- **sharing ideas** how to deal with these challenges
- **sharing experience** with the implementation of CC strategies
- **learning from legislative instruments** and subsidy arrangements in other regions



Thank you

