Impact of tourism on groundwater extraction on the island of Langeoog, Germany

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Water supply on the East Frisian Islands

The East Frisian Islands are a chain of barrier islands in the Wadden Sea area of the North Sea. Extensive intertidal mudflats separate them from the coast. Rainwater infiltrating into the dunes forms freshwater lenses in dynamic equilibrium with surrounding saline water. Water supply on most islands depends on these lenses.

The economic base of the islands is tourism. The high seasonality of this business and the elevated water demand of tourists stress the limited water resources. Climate change might exacerbate this situation.

Tourism

Langeoog 2011:
(a) 2,000 permanent residents
(b) 150 seasonal workers
(c) 1,540,000 overnight stays
(d) 124,000 day visitors

Water demand

Tourism Conclusions

- Water supply on East Frisian Islands mainly depends on freshwater lenses
- Tourism accounts for more than 70% of all water consumption
- Strong demand variations over the course of the year due to tourist seasons
- Water consumption has decreased due to implementation of water saving installations although number of overnight stays has become constant
- Tendency towards more frequent but shorter vacations might increase demand again (more frequent washing and cleaning)
- Future effects of climate change (rising temperatures in summer) might be a game-changer