



Impact of tourism on island freshwater lenses of the North German coast

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The impacts of tourism on the extraction of groundwater from fresh water lenses on some of the barrier island off the North German Coast were investigated. On the island of Langeoog, consumption steadily rose until the 1980s, parallel to increasing tourism. With the slow but steady implementation of water-saving household appliances and toilets in the 1990s, consumption has significantly decreased since. In 2011 extraction amounted to 333,000 m³/a. This is about a quarter less than the peak extraction of 452,000 m³/a recorded in 1983, although the number of overnight stays has increased in the same period! In 2011 around 1,540,000 overnight stays and 124,000 day visitors were counted. The permanent population on the island is about 2,000 inhabitants, with 150 additional seasonal workers present during the summer months. At least since 1990 the numbers for overnight stays and day visitors have remained relatively stable. The lowest water demand recorded during the off-season (winter) of 2011 was 238 m³/d while the maximum during the Easter holidays reached 1,894 m³/d, a factor of eight between maximum and minimum! The highest demand in summer corresponds to the season of lowest groundwater recharge. Consumption due to tourism is equivalent to about 72 % of all extraction. Water levels and chloride concentrations indicate stable conditions of the lens, though.