

# Small Islands Developing States



## Research and Solutions

Most small islands, such as in the Cariben or the Pacific but also in Indonesia and the Netherlands often suffer from fresh water security. Surface water resources are limited and they rely on small precious fresh groundwater lenses which are threatened by coastal erosion and over-exploitation. On top, these resources are extremely vulnerable to future sea-level rise, as most islands are situated no more than a few meters above the sea mean level. Deltares is studying the dynamics of these fresh groundwater using innovative monitoring techniques and the latest modelling tools. Once the fresh-saline groundwater processes are understood, responses are formulated to protect these lenses and the new solutions are tested in the field. Two examples are the SeepCat (short for seepage catcher) to catch the excess saline groundwater that flows towards the freshwater lenses under sea-level rise conditions, and an Aquifer Storage and Recovery technique called the CARD (a controlled artificial recharge and drainage system) that efficiently stores access of the fresh water from precipitation under the ground.



## Reference

- SeepCat: [Dutch innovation to protect fresh groundwater resources on small oceanic islands from sea-level rise](#)
- CARD: Pauw, P.S., Van Baaren, E.S., Visser, M. De Louw, P.G.B., Oude Essink, G.H.P., 2015, Increasing a freshwater lens below a creek ridge using a controlled artificial recharge and drainage system: a case study in the Netherlands, *Hydrogeology Journal*. doi: [10.1007/s10040-015-1264-z](https://doi.org/10.1007/s10040-015-1264-z)  
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