



Coastal groundwater exchange on a small Pacific atoll island: Roi Namur, Republic of the Marshall Islands

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Atoll islands, most of which only average 1-2 meters above today's sea level, provide a tremendous natural laboratory in which to study and better understand the intensifying impacts of high rates of sea-level rise on tropical reef-lined islands globally due to their unique geologic structure and limited water supply. Groundwater resources of atolls are typically minimal due to the low elevation and small surface area of the islands and are also subject to recurring droughts, and more frequent, storm-driven seawater overwash events. Although groundwater is the principal means of freshwater storage on atoll islands and is a major factor in determining the overall sustainability of island communities, hydrological data on how an aquifer will response to changes in sea-level rise or storm-driven overwash remain limited. We here present high-resolution time series hydrogeological and geochemical data to determine the role of the atoll's carbonate geology, land use, and atmospheric and oceanographic forcing in driving coastal groundwater exchange on the island of Roi Namur on Kwajalein Atoll in the Republic of the Marshall Islands. This information can provide new estimates on the recovery and resilience of coastal groundwater resources on such islands to expected climate change-driven perturbations.