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## Submarine Groundwater Discharge as Invisible Connection Between Land and Sea: First Results from Indonesia

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### Abstract

The term submarine groundwater discharge (SGD) describes all water that enters the sea through the seafloor. Although the largest proportion of SGD is recirculated seawater, freshwater SGD can constitute a major pathway that connects the terrestrial and the marine realm. Tropical regions are characterized by high anthropogenic pressure and heavy rainfalls. On tropical islands, SGD can be a relevant source of nutrients and pollutants to sometimes very sensitive coastal ecosystems. However, only little is known about the amount of SGD, its constituents, and their impact on marine ecosystems around tropical islands.

We analyse SGD from Indonesia and its impacts on the surrounding coastal ecosystems. Here, we present first results regarding locations and nutrient content of SGD from different Indonesian Islands. We used conductivity and visual identification to locate SGD sites around Java and other islands. In Java, SGD locations are abundant; we found obvious and large sites, e.g. at the beaches south of Yogyakarta, which are even used for freshwater supply of the local people, by asking locals. Smaller, unknown sites were identified visually during a reconnaissance field campaign, whose results we present. At some locations elevated nutrient levels were identified within the groundwater which might force eutrophication within the coastal regions of Java. In the future, we will use the identified locations for a more detailed study to understand the controls and impact of the SGD on the Indonesian Archipelago.

**Keywords:** Indonesia, nutrient, submarine groundwater discharge