

Master thesis at ZMT

Relations between submarine freshwater springs and fish population

Rationale: Submarine freshwater springs impact the aquatic environment in their surroundings by changing salinity, often adding nutrients or other dissolved constituents and often providing morphological features on the sea floor. It is likely that this affects the fish population. However, the effect of SGD on fish has been until now only studied by very few studies (Garcia-Orellana et al., 2016; Utsunomiya et al., (in press)). The thesis should assess the impact of SGD on fish populations at one example location.

Location

The submarine springs of Krakas Beach, Lombok, Indonesia (Figure 1), are known as a diving location. They discharge into a degraded coral reef at 5-10 meters depth. Close to the location there is a LIPI RCO field station which could serve as base, given that the scientists there are interested in collaborating. As Indonesian LIPI collaboration has been a bit complicated as of lately, this would 1) have to be checked early, and 2) if another location can be found, this should maybe be preferred.



Figure 1: Submarine spring at the envisioned field site

Methods

The location will be monitored with cameras proximal and distal to the submarine spring. Video analyses will show if the fish prefer or avoid the spring area. Fish will be caught and their stomach contents analyzed, the distribution of fish food will be mapped to find potential effects of the groundwater discharge.

Timeframe

The field work is scheduled to start in September 2016 together with field work of other members of the project crew.

For more details please contact Dr. Nils Moosdorf (nils.moosdorf@leibniz-zmt.de) and/or Dr. Werner Ekau (werner.ekau@leibniz-zmt.de).

References

- Garcia-Orellana, J., Lopez-Castillo, E., Casacuberta, N., Rodellas, V., Masque, P., Carmona-Catot, G., Vilarrasa, M., Garcia-Berthou, E., 2016. Influence of submarine groundwater discharge on Po and Pb bioaccumulation in fish tissues. *J Environ Radioact*, 155-156: 46-54.
- Utsunomiya, T., Hata, M., Sugimoto, R., Honda, H., Kobayashi, S., Miyata, Y., Yamada, M., Tominaga, O., Shoji, J., Taniguchi, M., (in press). Higher species richness and abundance of fish and benthic invertebrates around submarine groundwater discharge in Obama Bay, Japan. *Journal of Hydrology: Regional Studies*.