

Biogeochemistry of Lakes in Western Papua, Indonesia – First results of a pilot study

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Despite years of exploration for mineral and hydrocarbon resources, the lakes of Western Papua have received very little attention from a limnogeologic perspective. In some cases not even the maximum water depth of the lakes is published. The only research carried out so far focused on the fish and invertebrate fauna of the lakes, because the macrofauna of Papuan Lakes harbors many endemic species.

We carried out two limnogeologic campaigns in 2016 to measure water column profiles and take short (max 80 cm long) sediment cores in several lakes along the northern coast.

Lake Sentani consists of four separate basins with maximum water depths of 30 to 40 m, all interconnected by shallow sills. Although all four basins share the same surface water chemistry and exhibit sub- to anoxic bottom waters, each basin has its distinct water column stratification pattern and sediment geochemistry. Despite its coastal location and minimal elevation we could not identify an influx of seawater into the lake. A key feature of Lake Sentani is the geologically highly diverse catchment, comprising carbonates, metamorphic, (ultra)mafic rocks as well as sandstones and alluvial deposits. Also, only two basins appear to be anthropogenically influenced. Therefore Sentani is a unique natural laboratory to study the effects of catchment composition and processes on lakes.

Despite their location at almost the same latitude, other lakes (Ayamaru, Anggi Giji, Anggi Gida) exhibit different water and sediment chemistry because they are located in geologically completely different catchments and at different altitudes.

The lakes in West Papua offer the chance to study lakes in a wide range of geological settings that have experienced no or only minimal anthropogenic disturbances.