

## **Marine Lake Character at Misool Raja Ampat, Papua Gandi Y.S. Purba<sup>1,2</sup>**

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Marine lake or anchialine lake is a lake with no surface connection to the sea, containing salt or brackish water, which fluctuates with the tides. From reports there are 57 lakes at Palau, 46 at Ha Long Bay Vietnam, 14 anchialine habitats at Derawan Islands East Kalimantan, and from aerial survey and mapping estimated 55 lakes at Raja Ampat. Forty lakes from those lakes found at Misool and most of those lakes are inaccessible. This study aim to describe lakes physically at Misool i.e the morphology, water quality and the water lake original coming. The visited lakes are Lenmakana, Balbullol, Lenkafal, Keramat, Kawarapop, Keramat-2, and Keramat-3. We used sounding, tracking, and satellite image for mapping the lake and bathymetry. The widest lake is Keramat-3 i.e 3.25 Ha and the smallest is Kawarapop i.e 0,57 Ha. Balbullol is the deepest lake (38 m) and the shallowest is Keramat-2 (7,7 m). There are water level and conductivity loggers installed at Harapan Jaya port, Lenmakana, and Balbullol lake. The estimation of the origin of the lake water is done by using water sample from lake to analysis Deuterium ( $^2\text{H}$ ) and Oxygen-18 ( $^{18}\text{O}$ ). Result of 15 days recording is the same high tide time for Port and Lenmakana but delay 3 hours with Balbullol in the full moon. After 7 hours water become low tide at the port, one hour faster than Lenmakana and 4 hours faster than Balbullol. Temperature from these locations are show the same pattern but lakes are warmer than port, 1,83°C higher with Lenmakana and 0,77°C higher with Balbullol. Conductivity which is value using for salinity showed the lakes lower than port. However after calibration with salinity and temperature that measured with field device showed port salinity (31,44 ppt) higher than Balbullol (29,05 ppt) and Lenmakana (25,73 ppt). The origin of lake water is known from plotting value of  $^2\text{H}$  and  $^{18}\text{O}$ . Sample from Lake Balbullol and Lenkafal have a value relative isotopic composition ratio equal to seawater. This similarity indicates water at Lake Balbullol and Lenkafal are sea water while the water samples taken at Lenmakana, Karawapop, Keramat, and Keramat-3 are in the mixing between groundwater and seawater. This indicates those four samples are experienced very significant mixing of groundwater with seawater, the concentration of seawater is more prevalent. Water at Keramat-2 is strong original from ground water.

Key word : Marine Lake, Anchialine, stable isotope, Misool, Raja Ampat, Papua