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Thesis title: Assessment of Lake Taal's macroinvertebrate biological and functional diversity in ashfall impacted littoral zones after the 2020 Taal volcano eruption

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ABSTRACT

The lake littoral zone, an area extending from the shore to a depth at which 1% of incoming surface lights remains, permit unique flora and fauna assemblages to thrive. Its interaction with the riparian and limnetic zones allows the transfer of nutrients and particles to the lake's profundal zone. However, extensive anthropogenic and natural stressors and climate change have led to its drastic ecological decline across different lakes globally. In the Philippines, lakes are used for the culture of non-native fish, which comes with overfeeding of fish stocks, leading to human induced-eutrophication in most lakes. Lake Taal, the third largest lake in the country, has been previously classified as oligotrophic. Still, decades of unsustainable aquaculture practices, overfishing, and land-use change in its surrounding watershed placed the lake in the meso-eutrophic state. The lake also sits in the active Taal volcano that recently erupted in January 2020. The eruption ejected large volumes of ash, particulates, and gases in the atmosphere and the lake. Volcanic deposits have an immense ecological impact on the lake's biotic and abiotic integrity, as evidence by temperate lakes. A post-eruption survey in tropical lakes such as in Lake Taal's biodiversity is imperative. Thus, this study offers a unique opportunity to determine the status of post-eruption, littoral macroinvertebrate biological and functional diversity of Lake Taal across different spatial (heavy vs low ashfall deposit sites) and temporal (wet and dry season) scales. Specifically, the study aims to: (i) identify and compare the macroinvertebrate community composition and functional diversity across spatial and temporal scales, (ii) relate the littoral macroinvertebrate

assemblages with the measured water and sediment physicochemistry across spatial and temporal scales, and (iii) compare the pre-eruption to post-eruption littoral macroinvertebrate community structure.

Keywords: Post-eruption biodiversity; macroinvertebrates; tropical lake; littoral zone; functional diversity