Syazana Rashid

**Title:** Paleoecology of The Great Barrier Reef: projections of coral diversity and disparity between edge zones and central zones of coral colonies with increasing global temperatures

**Introduction (10 points)**

Species diversity and disparity would change differently between the outer edge and the central zone of a coral colony. Edge zones of a coral colony will have limited flow of genes and ecological support and can be a spot for high rates of adaptation. The change in environmental conditions could introduce new species into the edge zones as a result of migration, but may also lead to morphological changes. Based on the morphologies of Pleistocene corals and modern colonies, variation in morphological disparity between two areas: one being at the center and one at the edge of the Great Barrier Reef, can be studied. The extent of damage or magnitude of change in coral diversity over time can also be assessed and compared between these two zones.

**Justfication: (10 points)**

This study is significant in that it shows how much some of the Great Barrier Reef coral colonies are changing between the Pleistocene and the modern. Coral reefs provide critical habitat and food for many species hence its preservation is important for the continuous survival of the Great Barrier Reef ecosystem. According to Budd and Pandolfi’s 2010 paper, well-connected central locations of coral colonies have static lineages but edge zones where gene flow is limited have split or fuse lineages. This is interesting to because it would mean that different areas of the colony would react differently to changes in the environment. In particular interest, I would like to assess the contrast between the two areas in relation to increasing global and ocean temperatures. This study would determine the degree of change in diversity and disparity over increasing global temperatures between the corals at the edge zones and the corals at the central zone. It will also allow us to assess the changes that occur in the coral colonies including diversity, disparity, adaption, and coral damage. The analysis would be helpful determining areas of the coral colony that need more focus in conservation efforts for more successful survival of the corals in the increasingly warm future.

**Research Plan: (8 points)**

I will make use of the Great Barrier Reef Marine Park Province database for the bulk of the sources for modern colony conditions and species. I think that this data is appropriate because it is the most comprehensive one for the Great Barrier Reef region. I would compare the diversity and disparity of the species in the Pleistocene data with the modern data.

**References: (of 2500)**