Coral Algae competition on Glovers Reef Atoll, Belize

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The relative importance of physical and ecological processes in driving macroalgal dynamics is poorly understood. This study looked at the effects of coral-macroalgal competition on the growth and survival of three common Caribbean coral species (*Porites astreodies, Agaricia agaricites and Colpolphyllia natans*). The study looked at two different coral colony sizes and two common Caribbean macroalgal species (*Lobophora variegata and Halimeda opuntia*) over one year. Not surprisingly, smaller colonies were more susceptible to macroalgal competition, bleaching and disease. While the susceptibility of coral colonies to macroalgae competition remained similar across size classes, striking differences were observed on the interactions between coral and algal species. When competing with *L. variegata, C. natans* was the most resistant coral species, while both species of brooder corals were most affected by the competition with this macroalgae. When competing with *H. opuntia* there was not a significant difference between the three coral species of the large colonies; however, *A. agaricites* small colonies were significantly more susceptible to the competition than either of the other two coral species. There was no difference between small colonies of *P. astreoides and C. natans*. These results are really interesting since they identify one of the main spawners of the Caribbean, *C. natans*, as one of the best competitors against *L. variegata,* one of the most abundant algae on coral reefs. Fruthermore, they shed light on long-term species specific competition outcomes between corals and macroalgae.

Effects of the Gorgon dredging program on selected aspects of the marine biodiversity of the Montebello Barrow Island MPA's

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The Montebello/Barrow islands (MBI) are situated in the Pilbara Offshore marine bioregion (IMCRA, 1997) approximately 1,600km north of Perth. The marine ecosystem of the MBI's have remained in a relatively undisturbed condition due to the low human usage and strict management controls on industry activities in the area. In 2004 the Montebello/Barrow Islands Marine Protected Areas (MBIMPAs), incorporating the Montebello Islands Marine Park, Barrow Island Marine Park and the Barrow Island Marine Management Area, were gazetted to protect the diverse tropical marine biodiversity that characterise the waters surrounding these islands. The Gorgon Project (GP), based on Barrow Island, is one of the world's largest natural gas projects and the largest single resource project in Australia's history. The GP includes the construction of a 2.1km marine offloading facility plus a 2km LNG jetty (totalling 4.1km), and the dredging and disposal of The GP includes a dredging program that will involve the removal and dumping of ~ 7.6M tonnes of marine sediment over a period of approximately 18 months, which started in May 2010. The environmental approval for the GP included a number of environmental 'offsets', one of which was a total of $2.5 M over three years to the Department of Environment and Conservation (DEC) to assess the potential impacts of the dredging on marine biodiversity over the broader scale of the MBIMPAs in areas where modelling of the data suggested there would be no impact as a result of dredging activities. The Gorgon Dredging Offset Monitoring Evaluation and Reporting Project (Gorgon MER) provides an opportunity to determine the spatial extent and nature of short term (3yrs) changes in biodiversity asset condition as a result of the dredging and dumping activities. The Gorgon MER program must therefore also be able to discern changes in asset condition that are due to natural pressures. The Gorgon MER project is also designed to help inform future environmental impact assessments of comparable projects. Monitoring of the biodiversity assets of the MBIMPAs will be continued beyond the life of the Gorgon MER project to determine if there are long term changes in the marine communities as part of DECs long term marine protected area monitoring, evaluation and reporting program.

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