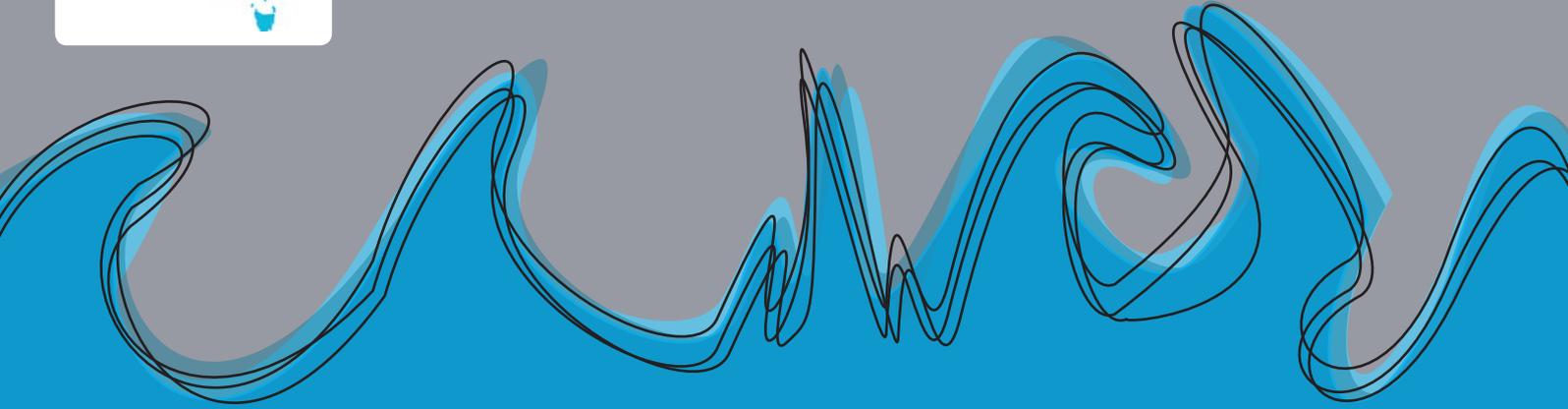




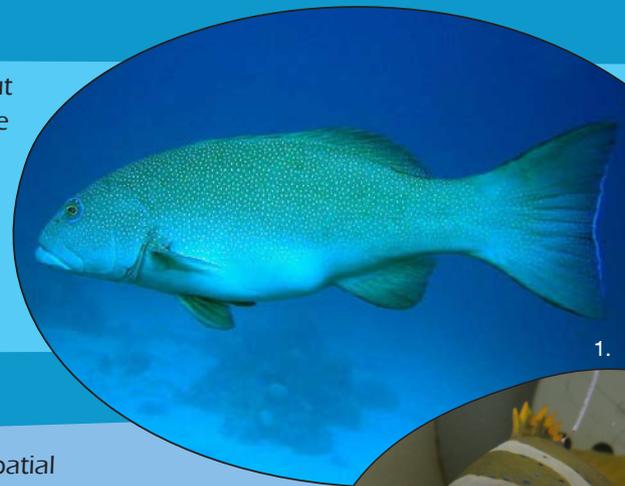
Effects of climate change on reproduction, larval development, and population growth of coral trout



Project Background

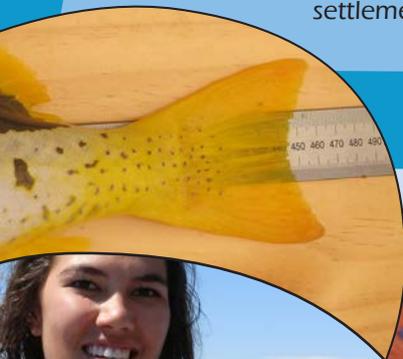
Climate change is emerging as the single greatest threat to coral-reefs and reef fish. However, current research is limited to small species, such as anemone fishes, which have little relevance to seafood and fisheries. Our goal is to test the effects of increasing temperature and the

acidity of ocean water on coral trout (*Plectropomus leopardus*), which is the most important fisheries species on the Great Barrier Reef. As such, this research will clearly establish the economic consequences of climate change on coral reefs in Australia and overseas.



Project Outline

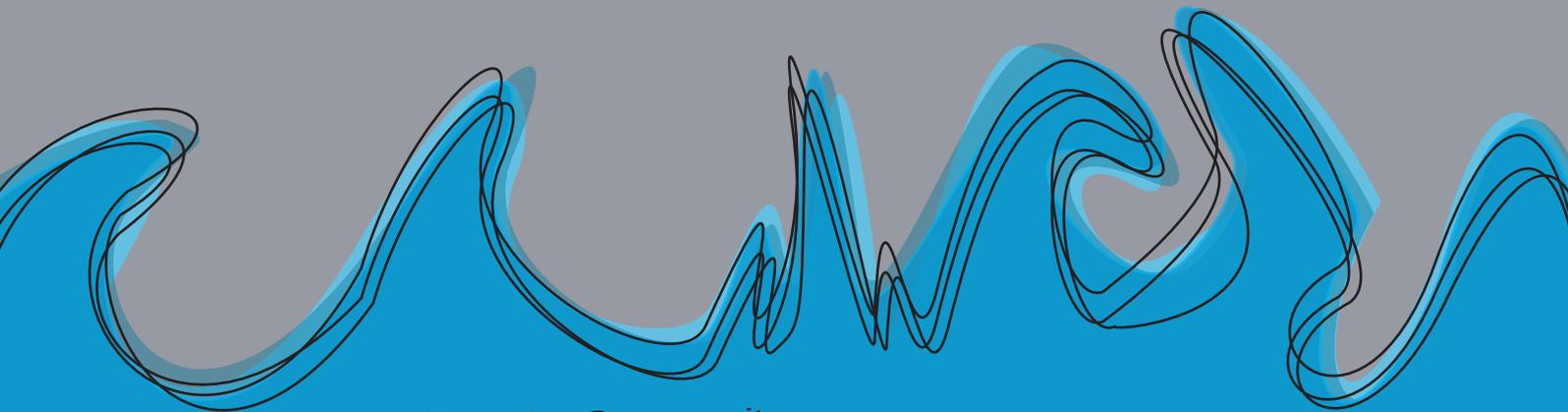
1. To assess sensitivities of coral trout to climate-related changes in temperature and seawater chemistry, during fertilisation and early larval development;
2. To test the effects of increasing temperature and ocean acidification on growth, condition, behaviour and survivorship of early post-settlement coral trout;
3. To test for spatial variation in sensitivities to increasing temperatures for coral trout in three distinct sectors along the Great Barrier Reef; and
4. To measure coral-dependence at different ontogenetic stages, to test whether coral trout will be adversely affected by climate-induced bleaching and coral loss.



Outcomes

One of the likely outcomes of this research is that certain populations (e.g., northern or southern populations) will be much more vulnerable to projected climate impacts (due to their differences in sensitivity and/ or exposure to environmental changes), which may necessitate a complete overhaul of planning and policy processes (e.g. new spatial management plans) to ensure sustainability of future catches.

If climate change is likely to undermine the long-term sustainability of wild harvests of coral trout then aquaculture may prove critical in meeting increasing national and international demands for coral trout. In this instance, data on key sensitivities of coral trout to changing environmental conditions (especially during early life-history stages) will be fundamental in assessing logistical and infrastructure needs (e.g. sea cages versus closed-system land-based aquaculture) for successful aquaculture production of this important and valuable food fish.



Benefit to the Community



This is the first comprehensive study on effects of climate change on the biology and ecology of a commercially important tropical reef fish. Moreover, this study is focused on the single most important coral reef fisheries target species, coral trout (specifically *Plectropomus leopardus*, in the first instance). Identifying the extent to which this species may be sensitive to climate related changes in environmental conditions (especially temperature and acidity of waters)

within the Great Barrier Reef Marine Park and associated nearshore waters is critical in assessing the vulnerability of reef fisheries to climate change. Ultimately, this research will help to fill key knowledge gaps about climate change impacts on larger fish which are fundamental to improving management, and in turn improve the capacity of industries and communities along the Great Barrier Reef to adapt to this changing environment.

More Info

Pratchett M, Reynolds A (2012) Effects of Climate Change on Coral Trout (*Plectropomus leopardus*), the Most Important Marine Fisheries Species in Tropical Australia. Marine Adaptation Bulletin (MAB), Vol 4, Iss 1, Autumn 2012; p2. ISSN: 2200-5684

http://arnmbr.org/content/images/uploads/MAB_v4_i1_Autumn_2012_ISSN_2200-5692.pdf



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The National Climate Change Adaptation Research Plan (NARP) for Marine Biodiversity & Resources identifies research priorities in five sectoral areas: marine aquaculture, commercial & recreational fishing, conservation management, tourism & recreational uses, and cross-cutting issues.

