DENNIS UDO HEINRICH

dennis.heinrich@my.jcu.edu.au
BSc (hons) 2012 to 2013
School of Marine and Tropical Biology
Sponsored by AIMS@JCU Project funds
Supervised by:
Prof. Philip Munday (JCU)
Dr. Michelle Heupel (AIMS)
Dr. Colin Simpfendorfer (JCU)
Dr. Jodie Rummer (JCU)

Ocean acidification and elasmobranchs: The response of the epaulette shark (*Hemiscyllium ocellatum*) to elevated CO_2

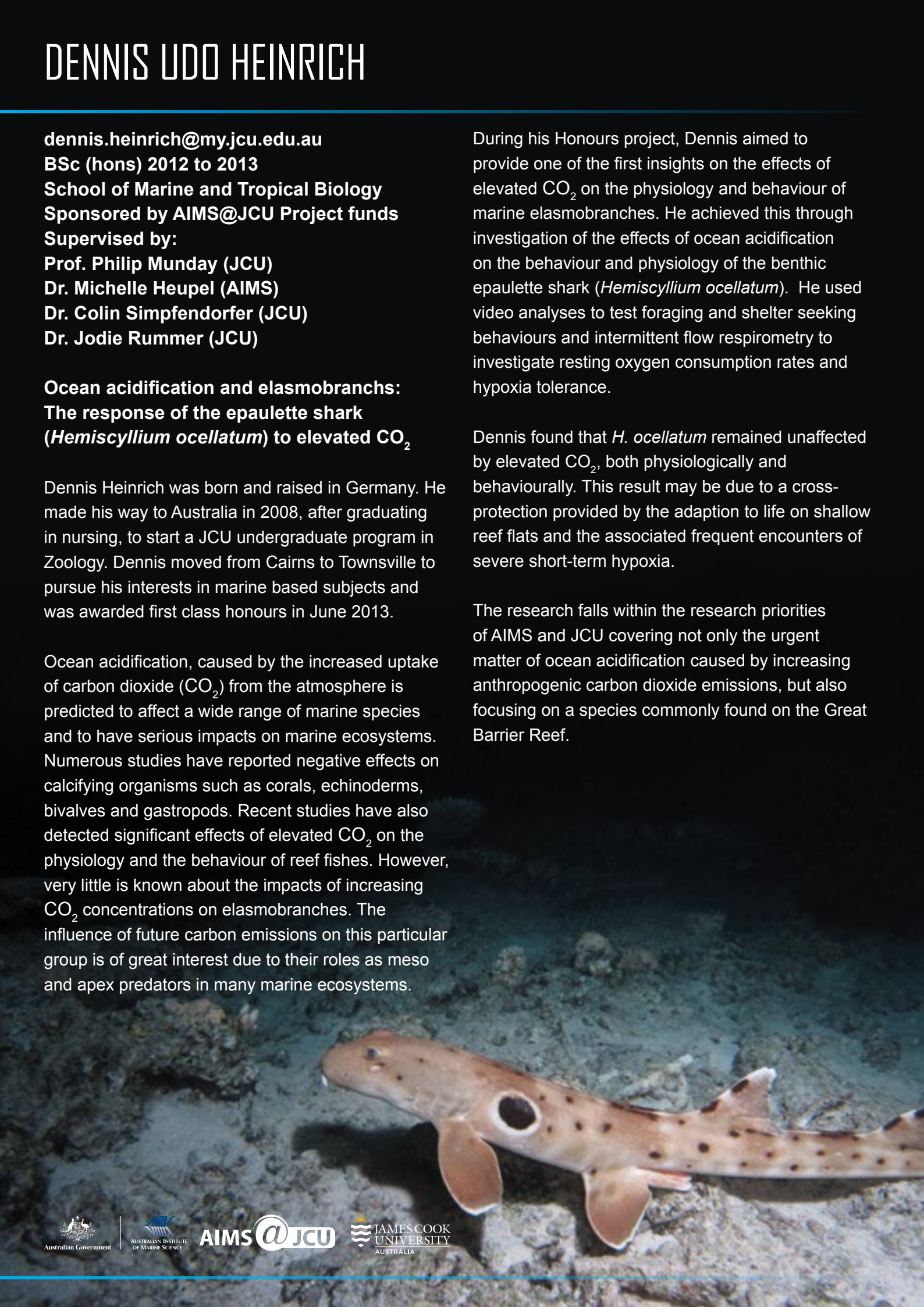
Dennis Heinrich was born and raised in Germany. He made his way to Australia in 2008, after graduating in nursing, to start a JCU undergraduate program in Zoology. Dennis moved from Cairns to Townsville to pursue his interests in marine based subjects and was awarded first class honours in June 2013.

Ocean acidification, caused by the increased uptake of carbon dioxide (CO_2) from the atmosphere is predicted to affect a wide range of marine species and to have serious impacts on marine ecosystems. Numerous studies have reported negative effects on calcifying organisms such as corals, echinoderms, bivalves and gastropods. Recent studies have also detected significant effects of elevated CO_2 on the physiology and the behaviour of reef fishes. However, very little is known about the impacts of increasing CO_2 concentrations on elasmobranches. The influence of future carbon emissions on this particular group is of great interest due to their roles as meso and apex predators in many marine ecosystems.

During his Honours project, Dennis aimed to provide one of the first insights on the effects of elevated CO_2 on the physiology and behaviour of marine elasmobranches. He achieved this through investigation of the effects of ocean acidification on the behaviour and physiology of the benthic epaulette shark (*Hemiscyllium ocellatum*). He used video analyses to test foraging and shelter seeking behaviours and intermittent flow respirometry to investigate resting oxygen consumption rates and hypoxia tolerance.

Dennis found that *H. ocellatum* remained unaffected by elevated CO_2, both physiologically and behaviourally. This result may be due to a cross-protection provided by the adaption to life on shallow reef flats and the associated frequent encounters of severe short-term hypoxia.

The research falls within the research priorities of AIMS and JCU covering not only the urgent matter of ocean acidification caused by increasing anthropogenic carbon dioxide emissions, but also focusing on a species commonly found on the Great Barrier Reef.



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