

Senate Standing Committee on Economics
ANSWERS TO QUESTIONS ON NOTICE
Innovation, Industry, Science and Research Portfolio
Additional Estimates Hearing 2009-10
10 February 2010

AGENCY/DEPARTMENT: COMMONWEALTH SCIENTIFIC AND INDUSTRIAL RESEARCH ORGANISATION

TOPIC: Australian Article – Great Barrier Reef

REFERENCE: Question on Notice (Hansard, 10 February 2010, E55)

QUESTION No.: AI-99

Senator IAN MACDONALD—That is for certain. I have not read the big volume that you are now referring to and which I learnt about for the first time at estimates yesterday. We are ploughing through that now. Certainly there does not seem to be, in my recollection, any reference in the chapter summaries. Can I go on to the issue that Senator McGauran raised regarding the *Australian* article on the Great Barrier Reef. I have had a look at the *Media Watch* issue and I have read Dr Poiner's letter. I might say that Dr Poiner's letter is very carefully couched. He is sort of saying, 'Well, it doesn't prove one thing, but by the same token it doesn't prove the other.'

Senator Carr—If you are going to quote from a letter, quote it properly. It makes it explicit, quite explicit, that AIMS's research has been ripped off. Do not play games here.

Senator IAN MACDONALD—I will get to that shortly, Senator. Dr Johnson, is it not a fact that there are coral reefs growing in waters around the world that are up to six degrees warmer than the Great Barrier Reef?

Dr Johnson—I am not an expert in coral reef biology. I would have to take that question on notice.

ANSWER

The Commonwealth Scientific and Industrial Research Organisation (CSIRO) does not conduct specific research on the distribution of coral reefs, or their occurrence in different water temperatures. However on the basis of work published by others in the peer reviewed literature CSIRO can provide the following information.

The statement that coral reefs are growing in waters around the world that are up to six degrees warmer than the Great Barrier Reef appears not to be correct, recognising that the exact answer depends on what is meant by reefs and by temperature (for example annual mean temperature, summer maximum temperature and peak temperature are all different temperature measures).

Overall, monthly mean water temperatures in the Great Barrier Reef region reach summer peaks of about 30-31°C, (Walker, 1981, Annual temperature cycle in Cleveland Bay, Great Barrier Reef Province, Aust. J. Mar. Freshwater Res., 32: 987-991), though it is likely to peak higher than this at low tide in shallow "bommies" and on reef flats in the summer.

Reputedly, the harshest, hottest environment where coral reefs are abundant is in bays in the Red Sea, an enclosed body of water surrounded by desert. Recent work on temperatures experienced by fringing reefs in the Red Sea indicate summer daily peak temperatures of about 34°C, three to four

degrees warmer than summer peak temperatures on the Great Barrier Reef. (Moustafa, *et al.*, 2008, What is normal? Extreme temperature variability on a high latitude, fringing Red Sea coral reef? Abstract, Amer. Geophys. Union Ocean Sci. meeting, 2008).

General information sources indicate summer mean temperatures in the Red Sea peak at 29-30°C, (<http://www.sharm-el-sheikh.com/General/GeneralDetails/Climate.htm>; http://en.wikipedia.org/wiki/Red_Sea), which is on the same order as found on the Great Barrier Reef.

Similar reports are available for reefs growing off Oman:

“Oman's reef corals can experience maximum temperatures which are among the highest that have been measured in the world and which would normally be considered lethal to corals.... Oman's normal summer maximum sea surface temperatures of around 32°C (90°F) are well above the temperatures that have previously been found to induce coral bleaching, in areas such as Panama, Tahiti and the Great Barrier Reef, where annual maximum temperatures are around 29°C (84°F)”.(source: <http://www.bishopmuseum.org/research/pbs/Oman-coral-book/Chap4/CorBkChap4.htm>)

It should be noted that the organisms occurring in each of these coral reefs will have evolved and adapted to their conditions. The reef forming organisms tolerating higher temperatures in the Red Sea or off Oman will differ from those organisms forming the Great Barrier Reef. Accordingly the survival of organisms in those locations cannot be extrapolated to the Great Barrier Reef environment.