Report of 21 June 2018 Meeting
Royal Society
Southern Highlands Branch

Speaker: **Associate Professor David Suggett M.Sc., Ph.D.**
Marine Biologist, University of Technology, Sydney

Topic: **Coral Bleaching: The delicate interface between corals and their algal symbionts driving future coral survival.**

In the past few decades, coral reef ecosystems across the world have suffered unprecedented degradation which has been attributed primarily to natural and anthropogenic factors. These include climate driven warming and acidification of the oceans as well as localized pollution, all of which result in bleaching of the reef-building corals. Mass coral bleaching has led to major losses of reef worldwide in the last decade, including the Great Barrier Reef during the 2016-17 heatwave.

Coral bleaching is a generic term used to describe loss of pigmentation from corals. Typically this reflects the rapid loss of pigmentation and/or cells of the corals' algal endosymbionts (zooxanthellae), the tiny plant like organisms living in the coral. These microscopic algae capture sunlight and provide essential nutrients to the coral. Much of this lecture was focused on the factors causing these zooxanthellae to succumb to stresses, leaving the coral in a bleached condition.

Dr David Suggett is a core member of the Climate Change Cluster (C3) at UTS where his research team focuses on improving primary productivity estimates using advanced active fluorometry approaches. The outcome of this research will provide more accurate information on the health of the Australian coastal waters. This information in turn will be used to improve Global Climate Models. Suggett is also the leader for the C3 Future Reefs research program, investigating how the environment shapes coral functioning and development. In this program, novel technological solutions are being applied to the monitoring and management of healthy reef corals. Of major importance is the team's innovative approaches to enhancing reef resilience to climate change.

An amazing example of coral resilience has been found in the Gulf of Aqaba, west of the Arabian mainland. Specimens of the coral there have been placed into tanks where they are exposed to rising temperatures and sub-optimal pH levels. Scientists reported that most of the variables measured, such as energy metabolism or the building of a skeleton were actually improved. One explanation for these surprising results where such corals are observed in the stress tests to be not only surviving, but thriving, is that coral in the Gulf of Aqaba is highly evolved due to historical extreme changes in the climate of the region. The ramifications of such discoveries may be significant. Associate Professor David Suggett suggests that events such as these teach us that corals are surviving in waters that are really hot, very acidic and have very little oxygen. He reminded his 40

person audience that these are the same conditions that have been predicted under climate change.

David Suggett currently leads expeditions to the Great Barrier Reef in the hope of discovering similarly resilient forms of coral in Australian waters. The ability to re-seed part of the dying reef with more resistant coral is so far untested, but it opens the door to more optimistic views on coral reefs of the future. What a contrast that would be to the numerous press reports of 2016 concerning Australian corals, where 99% of the reports were negative.

Anne Wood FRSN