

from coastal reef systems to the open ocean. More than 80 authors from different disciplines, across six clear direction for future research needs in this area.

Dr Ling said the global patterns in sea urchin overgrazing confirm what has been observed in Tasmania, and his clear message is that “an ounce of prevention is worth a ton of cure.”

“The infaunal bacteria that live in the sea urchin is within a balance, but the number reaches a tipping point where grazing overwhelms the kelp and the reef collapses to urchin barrens.”

“Recovering the kelp requires a global effort to remove sea urchins to be removed from barrens.”

Professor Craig Johnson, also from IMAS and a co-author of the study, added that: “We have seen this pattern in certain Tasmanian waters where it is relatively easy to control urchins in order to rehabilitate the kelp on large spatial scales.”

He said new management arrangements designed to rebuild local lobster populations on inshore reefs in eastern Tasmania will greatly reduce the risk of species destruction of kelp beds of importance which is becoming

The Theme Issue was released on November 9th and can be found here: <http://rsth.royalsocietypublishing.org/content/370/1659.toc>. The global synthesis conducted by Scott

Background

Marine ecosystem collapses have been reported worldwide and can cause major socio-economic impacts, from sea level rise to the loss of fisheries, coral reefs, and kelp beds. Safeguarding productive marine ecosystems for humans is imperative; however knowing when they are approaching dangerous tipping points can be difficult and often it can be too late to halt collapse once it starts to occur.

Because of this, Dr Ling said that degradation of marine ecosystems is of enormous concern to resource managers who are left with few practical options to eliminate sufficient urchins to rebuild the numbers of seaweed predators, but attempting to do the same thing once the system is reactive.”

A general feature emerging from across all systems examined in the Theme Issue is that collapses are rarely to blame, but rather a combination of impacts leads to collapse. Dr Ling said: “It’s a bit like the camel that broke the camel’s back where they blame the straw but they don’t see the huge burden the ecosystem was carrying in the first place.”

Dr Ling goes on to explain: “Importantly when the camel’s back is broken it simply doesn’t stand back up once you take the load off of its back; the camel needs a rest before it can get up and go on, or maybe it’ll never get back up - it’s the same with ecosystems, push them too far and they won’t recover.”

Dr Lind said that as human pressures on the marine environment increase the concern is that major shifts will become more frequent.

“Marine regime shifts present major challenges for ecosystem management, and in a world of increasing human pressures it is likely that collapses and the persistence of degraded ecosystems will increase with important implications for economies.”

“While the scientific community has made great strides in understanding the nature of regime shifts, strategies and practical tools for managers to anticipate and respond to are still scarce.”

“We must continue to find the tipping points of ecosystems and make sure we can avoid crossing them. This is especially true for the world’s most valuable living marine resources. Knowing when an ecosystem is approaching a tipping point and so careful monitoring of ecosystem state and developing early warning systems are definitely a must for marine resource management.”

Information released by:

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