

Sustainable Subtropical Reefs Alliance (SuSRA)

The SuSRA is a consortium of research and management experts working to promote the long-term viability of subtropical reefs and marginal coral reefs.

The Coffs Harbour Subtropical Reefs Declaration

Conservation and management of reefs and associated ecosystems is currently considered the most promising way to ensure their persistence under climate change. While there is considerable information on the processes and likely impacts of climate change on tropical coral reefs and temperate rocky reefs, very little is known for subtropical reefs.

The eastern and western coasts of Australia are amongst the longest latitudinal tracts of subtropical coastal marine habitat in the world, encompassing beaches, rocky foreshores, offshore islands, shoals and reefs. Subtropical reefs are characterised by an overlap of tropical and temperate species, high rates and magnitudes of fluctuation in environmental conditions, and significant seasonal variation in species assemblages. Climate change induced alterations in environmental parameters are likely to re-define the characteristics of subtropical communities, partly by range shifts of tropical and temperate species, but also through changing habitats and trophic interactions.

Subtropical coasts are also experiencing a major human population increase, with consequent increase in anthropogenic stress on adjacent marine environments. The viability of these expanding coastal human communities is inexorably tied to the natural values of the neighbouring marine environment which provide the economic basis for their survival through services such as tourism, recreation, human health and a range of fisheries. These natural values underpin many of reasons which draw people to live along the coast.

Climate change makes it imperative that we re-evaluate existing conservation efforts while generating new conservation strategies that will adequately address the threats facing subtropical reefs. The present dynamics of processes on subtropical reefs, and their transformations associated with climate change are largely unknown and are an urgent research priority. Which research will be most important to influence the adaption of current management strategies?

Meeting at Coffs Harbour NSW on 13 September 2010, experts actively involved in the research and management of subtropical reefs identified seven priority areas that should be targeted to improve the basis for decision making to address these current and future challenges in the management and conservation of subtropical reefs:

1. Integrate research and management activities across local government, state, and bioregion borders: To tackle climate change, research and management need to focus on understanding patterns and processes required to maintain natural ecosystems and connectivity. Much research has the facility to provide information to resource managers and politicians who make decisions about where, how and when to invest conservation dollars to maintain marine biodiversity and productivity and the associated benefits to humans. Managers and researchers must communicate with each other in participation with key stakeholders, and straddle political and administrative boundaries to allow an integrated regional approach to conserving and managing subtropical reefs along the spatial gradients relevant to climate change.

2. Quantify socio-economic factors and ecosystem services: Management decisions are constrained by social, economic and political factors. Managers of subtropical marine environments

require information on the extent and monetary value of human use practises, including distribution, and rates of change of: recreational and commercial fishing catch and effort; tourism; commercial research; and other uses. Quantitative or even qualitative information on environmental values and associated values of ecosystem services is urgently required. A mechanism for incorporating such information into a transparent, cost-benefit driven decision-making framework for managers is also needed.

3. Habitat mapping and ecological research: The extent, distribution and structure of habitats and their species composition are still not fully understood in subtropical regions. These gaps need to be filled by continued broad-scale and fine-scale habitat mapping, modelling and ecological research in subtropical marine environments.

4. Benchmark cross-realm connectivity: With increasing urban and rural development in subtropical catchments, there is a critical need to evaluate and quantify threats to marine habitats from terrestrial sources, and determine and implement mitigating management actions to safeguard water quality on subtropical reefs. Integrating cross-realm connectivity into management and conservation decisions is crucial.

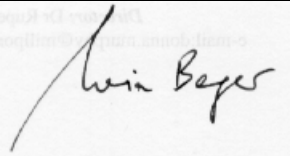
5. Know marine population connectivity: There is an urgent need to understand processes predicted to accompany climate change, such as pathways of tropical “invaders” and the role that Australia’s subtropical reefs may play in providing refuge for tropical species. The southward flow of the major boundary-current systems in Australia provides the opportunity for many species to shift from threatened tropical systems to subtropical (and even temperate) systems. Similarly, cross-shelf connectivity between estuarine, non-reefal, near-shore, and offshore reef environments warrants investigation.

6. Determine refugia: Sites that are resistant to, or better able to recover from, disturbance are key areas on which to focus strategic conservation or other management efforts, as these reefs will be important refuges of biodiversity and other ecosystem values. Targeted research is required to better understand the ecosystem processes that underpin ecological resistance and resilience, as well as vulnerability, in Australia’s subtropical coastal marine ecosystems.

7. Understand natural variability of environmental conditions: Subtropical reefs are marginal habitats for both tropical and temperate organisms (e.g., reef corals and kelp). They experience high levels of natural spatial and temporal variability in environmental parameters that are poorly understood. Quantifying the dynamics of environmental parameters and the corresponding variability in biological characteristics and processes is crucial in order to detect, predict and adapt to climate-change related shifts in key ecosystem components. In particular, little is known of how the productivity of subtropical reef systems may decline or improve with climate change and environmental perturbations (e.g. storms, floods).

We call upon practitioners, managers, researchers, funding bodies and governments to recognise that these priority areas require urgent attention and investment to enable effective and efficient decision making for the future of subtropical reefs. A list of topics of studies underway or recommended by our members, is available on request.

Signed:

		
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