



Managing our dynamic marine environment and fisheries sustainably requires robust long-term monitoring data that marine scientists and managers can analyse for trends and patterns. Over time, a deeper understanding of marine ecosystems can be established and science-based management recommendations can be developed.

However, as global ocean temperatures rise and we experience more extreme climatic events, this task is becoming increasingly challenging for marine scientists and managers. Determining what is 'normal' is becoming ever more complex, as is anticipating the consequences for our fisheries and ecosystems. This makes devising adaptive management strategies for a changing marine environment critical.

In response to warming ocean conditions, marine species face three options: adapt to the new conditions

and stay; move away in search of their preferred conditions; or die out. A new collaborative project called Redmap Australia is zeroing in on the movement option to ask the questions: are marine species shifting their ranges, are they just one-off visitors, or are they simply moving along the coast with seasonal variations?

Citizen scientists

Redmap Australia collects data by enlisting fishers, divers and beachcombers as 'citizen scientists'. The mission is simple—be on the lookout for unusual marine species at your favourite fishing and diving spots and log what you see on the Redmap Australia website (www.redmap.org.au). Anyone can take part in the project by uploading their photographs of out-of-the-ordinary species, together with details of when and where they spotted them. These reported encounters are then reviewed by a network of marine

scientists around the country, to verify the species' identities and confirm the quality of the data collected. In Western Australia, these marine scientists are from the Department of Fisheries, Western Australian Museum, the Department of Environment and Conservation and Murdoch University.

Each report to the website is like a piece in a puzzle that, over time, will reveal which species may be experiencing the greatest changes in their distribution and the regions in which these changes are occurring. Verified photographic reports are posted on the Redmap Australia website, enabling fishers and divers around the country to share their information and see how the project develops. The information will benefit the community, scientists and industry.

New knowledge

As part of a pilot Redmap project that started in Tasmania in 2009, there

Citizen scientists monitor marine change

by Mike Burgess

Something fishy is going on in Australia's oceans. And, with the aim of determining exactly what and how best to respond, the observation skills of an estimated three million people are being recruited to be involved in a new nationwide initiative called Redmap. Through this initiative—also known as the Range Extension Database and Mapping project—marine scientists have joined forces with divers and fishers to collect and share data that can help reveal whether fish and other marine species are shifting where they inhabit due to warming oceans.



Use your smartphone and QR reader to view Redmap on your phone.



have already been several dozen reports of new species, or reports that extended the documented range of known species in Tasmanian waters. WA fishers, divers and the wider community can also help gather this kind of information, and the sooner this occurs the more useful the information will be. An extreme event during the summer of 2010–11, dubbed the 'WA marine heatwave', provided a stark demonstration of the effects of ocean temperatures more than three degrees higher than normal over a wide area of WA's west coast. The immediate result saw extensive fish and shellfish kills along the Mid West coast, regional level coral bleaching and numerous reports of tropical fish species along the lower west and south coasts. Longer-term consequences are being investigated or are only now becoming apparent. For example, University of Western Australia (UWA) researchers have recently published a paper documenting how the range

Above main Fishers are helping monitor marine life.

Photo – Redmap

Inset Redmap website.

Right Chinaman cod.

Photo – Phillip Good/Redmap

of a brown macroalgae (*Scytothalia dorycarpa*) has contracted by more than 100 kilometres on WA's west coast due to the marine heatwave. Other UWA researchers have also measured damage to seagrass beds in Shark Bay.

So next time you head out on or in the water, have your camera or mobile phone ready—you just don't know what you will spot. Register as a Redmap Australia member, sign up for the quarterly newsletter and, most importantly, log unusual marine species on the Redmap website.



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Redmap is a comprehensive collaborative project led by the Institute for Marine and Antarctic Studies at the University of Tasmania, and involves the University of Newcastle, James Cook University, Primary Industries and Regions South Australia, Museum Victoria, Department of Fisheries WA, the University of Adelaide and the South East Australia Program.

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