

# WAMSI NODE 4 MILESTONE PROGRESS REPORT (MPR)

## Project Details

Project No. and Title	4.2 Assessment of marine communities and the impact of anthropogenic influences.
Node Leader	Rick Fletcher
Project Leader	Euan Harvey
SubProject No. and Title	4.2.4. Cost effective methods
Project Start Date	1/1/08
Project End Date	30/12/09
Due Date for this Milestone	30/6/08
Milestone Description	Post-docs and Senior Research Scientist appointed as per 4.2.2. Literature review (including report) on alternative sampling designs completed. Power analysis on habitat/SB data sets completed. Trial sites for SB indicators identified.

## 1. Executive Summary

### **Appoint 2 x postdoctoral researchers (UWA) and Snr Research Scientist**

Ben Radford and Tim Langlois were appointed as research fellows and with Jessica Meeuwig as the senior research scientist in August of 2008.

### **Literature review on alternative sampling designs**

- A broad range of sampling designs and techniques are used for long-term monitoring in ecological studies. For a program to be cost-effective and able to detect significant change it is imperative that the most appropriate design is implemented. We conducted a review of existing methodological approaches to determine which designs would be most applicable to the nearshore communities of WA. The review highlighted the importance of hypothesis testing, the usefulness of large-scale environmental gradients and regression-type analyses, the need for randomisation and the cost-effectiveness of spatially and temporally nested designs.

### **Power analysis on habitat/SB data sets**

- An investigation into the distribution and variability of potential habitat and sessile benthic indicators was conducted to estimate the power of certain indicators/ methodologies to detect ecologically significant change. A long-term dataset derived from biomass sampling suggested that some metrics, particularly 'total biomass' and the biomass of *Ecklonia radiata* and *Scytothalia dorycarpa*, were stable in time and space, and could serve as cost-effective indicators of change.
- A separate dataset was obtained remotely with a 'drop camera' system, which was used to conduct extensive surveys of benthic community structure along a latitudinal gradient. Initial analysis suggests that the structure of benthic communities does not change predictably with latitude, and that local-scale processes are important drivers of ecological pattern. Even so, the percent cover of some species and broad taxonomic groups did change predictably along a latitudinal cline. Most noticeably, the percent cover of *Scytothalia dorycarpa* and 'sponges' was positively correlated with latitude, while 'brown foliose algae' and 'corals' were inversely correlated with latitude. The

distributions of these groups are thought to be largely driven by temperature, and as such they may represent useful tools for detecting oceanic warming in the region.