RAPID ASSESSMENT OF MARINE POLLUTION (RAMP)

Pragmatic monitoring and prediction capabilities must be designed and built to provide confidence that human impacts are being minimised and that threats to human health have been contained. This is especially true in developing countries where the availability of highly trained personnel and sophisticated analytical facilities are limited. These issues require the development of simple, robust, cost effective environmental assessment procedures that can provide the basis for prioritising among study sites, so that resources can be expended efficiently and effectively.

RAMP has been designed to deliver inexpensive and routine early warning methods to determine the effects of contaminants on marine organisms. There are three stages from simple biomarkers to determine general ecosystem health, specific markers to elucidate the cause of the stress and special simple chemical procedures called to identifiy specific pollutants. In illustrating the effect of pollutants on organisms in real time, heart-beat monitors for marine organisms have been developed. One can illustrate the effect of poor water quality on the physiological function of an organism. This has a profound impact as most humans are familiar with electro-cardiograms for people and the effect of stress on people. This demonstrates that water quality seriously stresses marine organism such as crabs, and when the contaminants are removed the heartbeat returns to normal. Figure 1 (top left panel) shows the heartbeat monitor attached to a crab, the central panel shows the heartbeat of the crab, and the right panel shows the heartbeat of crabs going along a pollution gradient in New Zealand (note the variability in heart rate change from the pristine site to the polluted site.