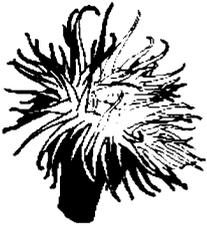


Marathon Dive

The 2004 Reef Watch “Marathon” dive took place at Noarlunga Reef on Sunday 14th March and involved 50 divers and 20 snorkellers. In total there were 41 fish surveys and 18 benthic surveys (LITs were done for the first time on a marathon dive). There was significant media coverage of the event.



Half of the 50 divers had been previously trained in the survey methods, while the other half received training on the day, as part of the PADI Reef Watch Survey Diver Specialty Course. For Tim Woonton and Maggie McGilchrist, it was their fourth and final dive of this course which now has 28 graduates and 88 other divers at various stages.

The event could not have taken place without the involvement of the dive instructors and divemasters, namely Dave Albano, Andy Davoren, Christopher Deane, Kevin Smith and Nick Turich, and of course Mary-Anne Stacey who ran her boat from dawn to dusk. The assistance of Daryl Metters, Patsy Mendham, Judy Kirkman, various members of the steering committee and many other volunteers was also vital.

The kits used for the monitoring were the result of a grant of \$1800 from the PADI Project AWARE Foundation. The event was also supported by Port Noarlunga Dive and Snorkel Centre, Underwater Sports, Southern Diving, Dolphin Dive and Divers Delight, who provided various incentives and discounts to participants. Dolphin Dive have agreed to give ongoing such support to the program, and discussions are continuing with the metropolitan dive shops.



The data gathered was entered on the day or shortly after, and is currently being processed, along with data from previous marathon dives in 2000, 2001 and 2002. The results are being compared with those of scientific studies performed for the EPA by Adelaide and Flinders Uni in 1996 and 1999 (see the Reef Watch website www.reefwatch.asn.au, “Reef Health Monitoring -> Reports” section for these reports).

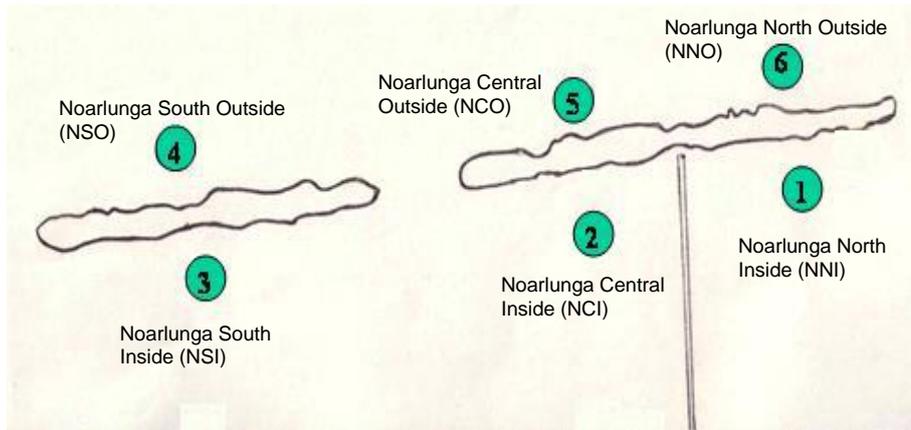


A more complete analysis of the data from Marathon dives and the conclusions reached is being compiled into a report that will be freely available. Articles are also being prepared for Southern Fisheries, EcoVoice and numerous other publications. For now, we will present a subset of the results.



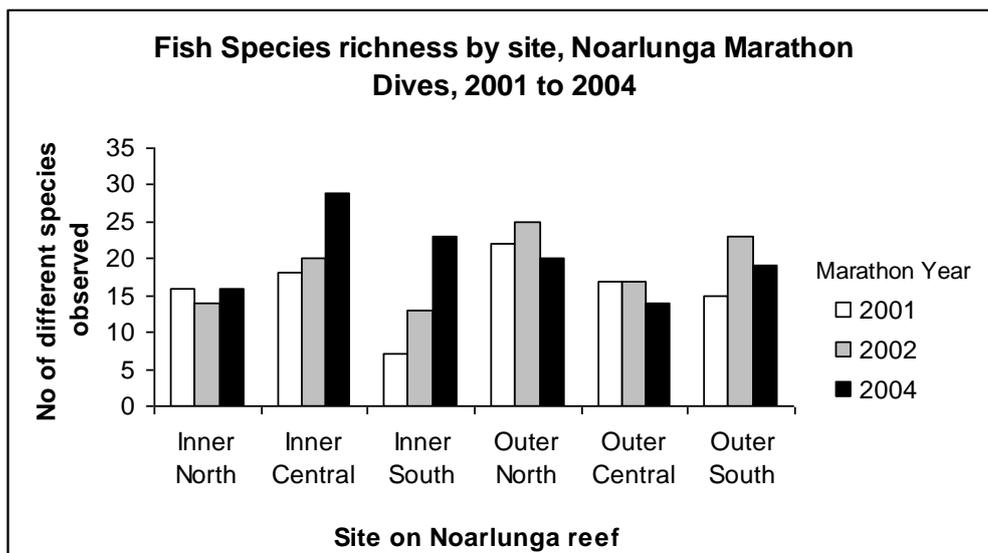
Marathon Dive Sponsors

The following map is to assist interpretation of the results:



Fish

One simple yet interesting finding from the fish data collected during the 2001, 2002 and 2004 Marathon dives is the total number of fish species (“species richness”) observed in different parts of the reef. This is shown in the graph below:



If you look at the numbers of fish species in 2001 (white bars) there appear to be more fish species present at the northern outside site than at other sites. The pattern is quite similar for the 2002 (grey bars) marathon dive. This consistency in the data, for most of the sites across several marathon dives, shows that we can be fairly confident in the quality of the data.

The observations for 2004 showed some slightly different trends. Firstly there were 29 species observed at the central inside site compared to 20 in 2002 (although the fish count methodology had changed during 2003, with a second or return pass for recording fish under the canopy or ledges, the data from this second pass was not included for this comparison).



One might argue that this difference of nearly 45% is due to volunteers improving their fish identifying skills over the years! This may be true to a certain extent but there were also fewer species recorded in 2004 at each of the outer reef sites than in 2002.

Not all of the sites were surveyed in 2000 and for clarity those data were not presented in the graph above, however, for each of the 3 outer sites that were surveyed in that year there were far fewer fish species recorded than in every subsequent marathon dive.

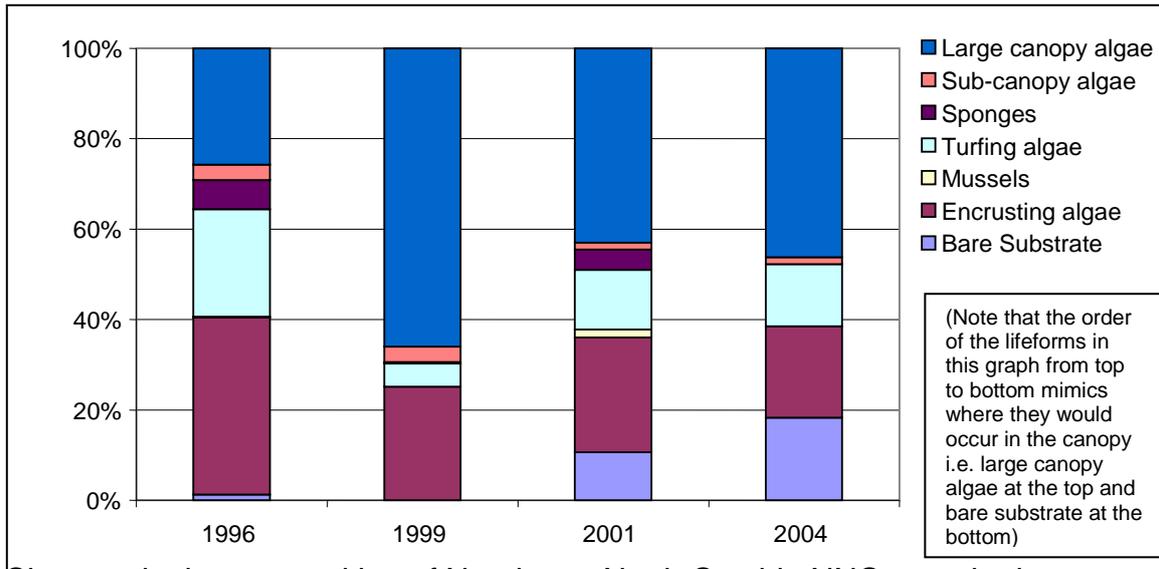
While there are a few different factors which affect the way this information can be interpreted there does appear to be a trend of improving fish species diversity over the five years that volunteers have been collecting information during Marathon dives.

Benthic Habitats

The report currently being prepared about the Reef Watch marathon data will show the current status of the Noarlunga benthic reef habitat, and will explore any links between this and the results of the most recent fish survey. It will also describe in general terms how different parts of Noarlunga Reef have changed over the last decade. Data from two sources will be used:

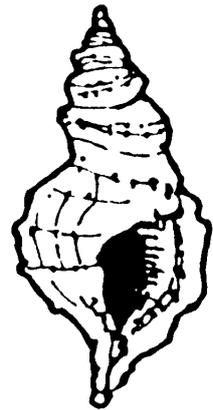
- The Reef Health studies undertaken by Flinders and Adelaide Universities for the EPA in 1996 and 1999 (prior to the first Marathon Dive). Reports from these studies are available on the Reef Watch website (www.reefwatch.asn.au, "Reef Health Monitoring -> Reports" section).
- Reef Watch data from 2001 and the 2004 Marathon Dive. Note that Reef Watch is the only program that has been monitoring the metropolitan and southern reefs over the last five years.

Here is some preliminary information about the change to one section of the reef, the northern outside reef (NNO), over the last eight years. The graph below indicates how the bottom cover is divided up between the various lifeforms identified during the surveys (totalling 100% for each year surveyed). For example, the top part of each graph is the large canopy algae (in blue for those of you that are reading the colour PDF version). You can see that it accounted for about 25% of the cover in 1996, about 65% in 1999, and then about 45% in 2001 and 2004. Also, there was almost no bare substrate (rock) in 1996 or 1999, but it increased to about 10% in 2001 and 20% in 2004.



Changes in the composition of Noarlunga North Outside NNO over the last decade. Data for 1996 and 1999 were obtained from the Reef Health Surveys commissioned by the EPA while more recent data (2001, 2004) were collected by Reef Watch volunteers.

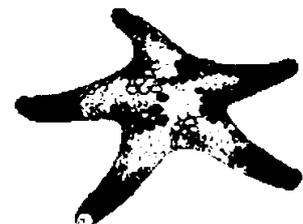
Note: given that the LIT method records the cover of organisms from above, it is biased towards the canopy lifeforms. As a result, if there are a lot of large algae, smaller lifeforms (e.g. LOBE algae, or STAR or SNAIL invertebrates) may not be recorded because they weren't visible below the canopy. It does not mean that they weren't there! If the quadrat method were used instead, those organisms would have been recorded. The LIT method does however have a number of other advantages that make it a more reliable method overall.



How Noarlunga Reef Has Changed

To understand the changes to a particular reef or section of reef, it is important to know what was happening in the wider area. According to available data, macroalgal cover on most of the Gulf St Vincent reefs was less during the mid 1990s than at the end of the decade, hence the change from 25% large canopy algae to 65% in the 1990s on the outer north section of Noarlunga Reef. This is believed to be the result of variations in climate (more information can be found in the 2004 PhD thesis by Reef Watch Chairman David Turner).

Reef Watch divers have detected a reduction back to about 45% during 2001 and 2004 on the outer north section of Noarlunga Reef. This is believed to be the result of changed conditions on the reef arising from increased sedimentary impacts (see David Turner's thesis).



Another scientific reef health survey is being planned for the end of this year with funding from a number of state and federal agencies. This will provide an opportunity to validate the findings of Reef Watch divers.

Importance of these findings

The large canopy algae described above are an important part of the reef ecology, providing lasting homes for a number of other species. The replacement of these large brown algae with bare space can be taken as a sign of degradation, and reefs under such stress may be in danger of losing some of their diversity.