

Seagrass-Watch

news

Issue 25 • April 2006

In this 25th edition of the newsletter we are highlighting Seagrass-Watch's international links, including articles which feature the importance of seagrass to seahorses, dugong, turtles and fisheries.

This newsletter also contains reports from those groups who have started monitoring for the year or who have attended training workshops in Queensland and New South Wales. The start to the New Year however, has not been so great for some. In northern Australia, Tropical Cyclone Larry, category 5, hit the region from Mission Beach to Cairns on 20th March 2006. The region suffered significant damage, particularly the coastal townships. 30% of homes in the Mission Beach area were either destroyed or severely damaged. It is unknown what level of impact the cyclone had on the nearshore seagrass meadows. The next suitable tides to inspect the seagrass at Mission Beach are not until late April, when groups will be conducting Seagrass-Watch and RWQPP monitoring.

In other news, Seagrass-Watch is working with new groups in Australia, and the website has had a major overhaul. You can now easily navigate using an interactive map to view the status reports. Check out the latest news and the new gallery page. Also, if you have not registered with Seagrass-Watch HQ, please do so online.

Seagrass for Seahorses

Choo Chee Kuang Reports

SOS Malaysia is monitoring seagrass and using the Spotted Seahorse, *Hippocampus kuda*, as a flagship species to help conserve the Pulai River Estuary in Johor. SOS stands for "Save Our Seahorses", a non-profit organization comprised of young scientists, students, public volunteers and local fishing communities.



The Pulai River Estuary boasts the most extensive intertidal seagrass meadow in Malaysia and supports large tract of intact riverine mangroves and endangered species such as the seahorse, pipefish, dugong and sea turtles.

However, developments from the surrounding areas are closing in since the last decade and had resulted in habitat and species loss. SOS is fighting to conserve what still remains in the Pulai River Estuary through research and awareness raising activities.

Since September 2005, SOS volunteers deploy the standard Seagrass-Watch monitoring techniques to monitor the seagrass meadow. The seagrass meadow, located

between Malaysia and Singapore, is approximately 1.3 km in length. So far 10 seagrass species are found here with the predominant ones being *Enhalus acoroides* and *Halophila ovalis*. Apart from seagrass monitoring, they also conduct capture and release research on seahorses and pipefishes to estimate their population abundance, seagrass invertebrates census and community survey.

The data gathered will aid in the development of a long-term conservation



and management plan for the Pulai River Estuary. SOS is working closely with the government and developers to achieve this goal. For more information, please visit www.sosmalaysia.org

Left: SOS volunteers preparing to do their job - the seagrass meadow can only be reached by boat.

Right: Measuring a spotted seahorse, *Hippocampus kuda*, in the field before it is released back into the meadow.

Below: SOS volunteers use a drag net to collect spotted seahorses for population assessments.



Above: The wing shell or "siput gonggong" is the most sought-after invertebrate collected by local communities.



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India

Gulf of Mannar Marine Biosphere Reserve

K.R. Saravanan (Wildlife Institute of India) Reports

With the assistance of Seagrass-Watch, seagrass ecosystems of the Gulf of Mannar Marine Biosphere Reserve will be assessed and monitored.

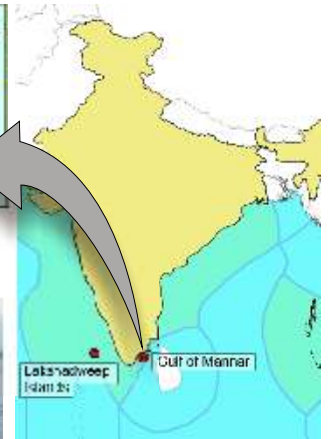
The Gulf of Mannar Marine Biosphere Reserve (GOMBR) was the first marine biosphere reserve in India and in southern Asia. The Reserve was one of six areas chosen on the basis of its threatened status and richness of biological wealth for inclusion into an action programme to save India's protected areas for future generations. It is located on the south eastern tip of India, in the state of Tamil Nadu. The GOMBR is an international priority site for many reasons: its biophysical and ecological uniqueness, economic, social, cultural, scientific importance, national and global significance.

The inhabitants are mainly Marakeyars, local people principally engaged in fisheries. More than 50,000 fisherman living on the coast of the Gulf of Mannar directly depend on the fisheries resources of the reserve for their livelihood.

The Biosphere reserve extends from Rameswaram Island to Tuticorin in a NE-SW direction to a distance of 140 km. There are 21 islands running almost parallel to the coastline of Gulf of Mannar with around 3,600 species of fauna and flora, which comprises of 3 different ecosystems - seagrass, mangrove and coral reef. The shallow waters in the area have the highest concentration of seagrass species along India's 7,500 km coastline. 11 species of seagrass recorded in India are found in the reserve. The island's surrounding shallow waters harbours 3 species of seagrass that are found nowhere else in India. These meadows support complex ecological communities and are of global significance as they are among the largest remaining feeding grounds for the globally endangered dugong, *Dugong dugon*, in India. Additionally, five species of marine turtles, innumerable fish, seahorse, molluscs and crustaceans also feed here.

Over harvesting of marine resources is one of the major threats to the ecological balance of the region. The introduction of large fishing operations has been a problem with inappropriate bottom trawling practices damaging seagrass meadows. Due to lack of awareness and poverty, the fisherman are also forced to indulge in destructive fishing practices such as dynamite fishing, using 'Taallumadi' and 'Rollermadi' kind of nets. The consistent failure of the monsoon has also encouraged many people from the mainland area to move into fishing activities, adding to the existing pressure on the marine resources of the area.

Further illegal destructive practices such as mangrove cutting, coral mining for cement industries and indiscriminate



collection of seagrass for industrial use collectively have had impacts on the sensitive marine ecosystem.

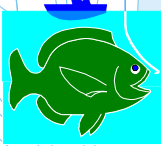
Pollution by industries is also having significant impacts. The major polluting sources include effluent from power stations and chemical works. The dumping of fly ash slurry into Karapad Bay has also resulted in filling up an extensive portion of the Bay. The ash, on being carried far into the sea, has also impacted on the sedimentary biota, algal beds, chank, corals and pearl oysters. Mangroves, which grow on the margin of the shoreline, have come to accommodate high levels of ash.

One of the major threats to the reserve is the Sethu Samudram Ship Canal Project on the coast of Tamil Nadu. It entails the dredging of a canal to enable faster sea travel between the east and west coasts to prevent ships having to sail 700 miles around Sri Lanka. The canal will require constant dredging to maintain a depth of about 10-14 m and aside from the immediate area of the sea bed, the consistent churning of sediment may also smother adjacent coral reefs and seagrass meadows. The increase in shipping traffic could also result in an increase in oil spills and marine pollution.



With these increasing and often competing pressures on resources in the Gulf, there is a need for government agencies, industry, community and local government to work together to develop a coordinated management plan. The provision of accurate assessment and monitoring of marine resources, including seagrass, is the foundation to developing a well-informed plan.

Without adequate management and enforcement, the seagrasses, dugongs, sea turtles and biodiversity of the Gulf of Mannar may be threatened, together with the livelihoods of thousands of traditional fisherfolk. 🌱



Seagrass meadows in the Gulf of Mannar in early 2006 with heavy epiphyte and macroalgal cover



Indian Ocean

Lakshadweep Islands

Seagrass-Watch is providing technical support for the assessment and monitoring of seagrass ecosystems of the Lakshadweep Islands.



Lakshadweep is an archipelago of 36 islands situated off the Kerala (west) coast of India. The group consists of 12 coral atolls, 3 reefs and 5 submerged banks. The tiniest Union Territory of India, the Lakshadweep (meaning "thousands islands") are 10 inhabited islands and 17 uninhabited islands with a total geographical area of 32 km², formerly known as the Laccadive. Lakshadweep is a geographical extension of the Maldives island chain. The local population on these islands numbers some 51 000, and fishing is an important activity, although largely focussed on offshore (non-reef) stocks.

Typically the atolls have shallow lagoons, averaging a depth of 3-5 meters, with islands mostly occurring on the eastern rims. The islands are characterised by major coral reefs around them, with sandy beaches and seagrass meadows in the lagoons, and coralline algal ridges and storm beaches towards the windward side. At least 70 species of corals and 7 species of seagrass have been reported from these atolls.

Seagrass meadows occur in long stretches along the shores and are confined to depth of up to 3 m. The total seagrass cover in the Lakshadweep regions was estimated to be 1.12 km² of which Minicoy (the southernmost island) has a maximum of 0.4 km², followed by Kavaratti (0.34 km²) and Agatti (0.19 km²). Seagrass flora of Lakshadweep is dominated by *Thalassia hemprichii* and *Cymodocea rotundata*. The seagrass meadows are mainly confined to lagoons towards the leeward side, and can include *Syringodium isoetifolium* and *Halophila ovalis*. Small patches of *Halodule uninervis* and *Halophila ovata* occasionally occur in the protected sandy regions of the lagoons and on the reef flats towards windward sides at Kavaratti and Agatti islands.

The major threats to seagrasses are erosion, siltation, construction, mechanised fishing, dredging for cargo transport and oil pollution. There has been sand mining in some lagoons which is likely to have impacted areas of reef. Tourism is a small but growing activity: access requires a permit and tourist numbers are currently below 1 000 per year. 🌱



Post tsunami workshop

A workshop "Post-Disaster Assessment and Monitoring of Coastal Ecosystems and Biological and Cultural Diversity in the Indian Ocean and Asian Waters" was held in Phuket, Thailand, 20-24 February 2006. Seagrass-Watch participants from Indonesia, Thailand and Seagrass-Watch HQ attended.



The workshop was a response to an urgent Call to Action in order to understand & mitigate the impact of natural disasters on coastal ecosystems of the Indian Ocean & Asian waters.

Organised by UNESCO-IOC/WESTPAC and the Department of Marine and Coastal Resources (DMCR) of the Ministry of Environment and Natural Resources of Thailand, the workshop was attended by 171 participants representing 30 coastal countries from 5 continents, and fringing the major seas of the world. Most of them border the Indian Ocean and Asian waters. 31 regional and international agencies were also represented.

The overall objective was to share lessons and experiences of post-tsunami human and ecological rehabilitation leading to better approaches to coastal management. The workshop included plenary presentations and focussed discussions. Audience & participants were mainly natural scientists & ecologists, fisheries experts, social scientists, anthropologists & culture experts, protected area managers, educators, development planners, tourism entrepreneurs, resort operators, concerned government officials, NGOs, & local communities, including cultural minorities.

In general, seagrass meadows appeared to have suffered relatively little impact from the tsunami. Mangrove ecosystems showed a high level of resilience due to their flexibility. Rapid surveys of coral reefs, carried out by some academic institutions, found that 2 to 10% of reefs were broken. Some reefs were covered by debris washed down from the shore/houses and by sediment. Some shorelines and land/sea scapes have changed or been damaged.

In the long term, the results of the workshop are envisioned to be an integral part of the hazard warning, preparedness & mitigation systems for the regions. 🌱



Above: tsunami warning tower on Patong Beach

Right: workshop delegates





Thailand



Naucrates

Monica Aureggi reports

In late 2005, Naucrates and Seagrass-Watch formed a partnership to assess and monitor the seagrasses surrounding Phra Thong Island, southern Thailand.

Naucrates, an Italian NGO, has been running a conservation project on sea turtles, mangrove forests and coral reefs at Phra Thong Island since 1996 in collaboration with the Phuket Marine Biological Center (PMBC) and the Ranong Coastal Resource Research Station (RCRRS).

Naucrates, from Greek language "who dominate the sea", operates in several countries and works with other worldwide organizations and institutions to find the best conservation strategies to save sea turtles and their habitats. Naucrates focuses on scientific research: collecting basic information to design conservation strategy and actions. Educational and conservation awareness activities involving local communities are also conducted in parallel with research.

Since 1996, they have been finding and protecting nests belonging to 3 different species of marine turtles: Leatherback, Olive Ridley and Green turtle. The greatest success of the programme has led to the elimination of egg poaching activities.

Unfortunately, on 26th December 2004 the project was completely washed away. The centers museum, volunteer huts, instruments, turtle tanks etc. were lost in the Andaman Sea. However, this material loss was nowhere near comparable to the loss of two members of the Naucrates team (Lisa Jones from the UK and Rebecca Clark from Canada) and four members of the Thai staff (Lung Pan (carpenter), Lung Lue (gardener), Ae (waitress), and young Duan (driver)) who were working at Kho Phra Thong when the tsunami wave hit the island. Since the devastation of the tsunami, the group has been working to rebuild the research centre and the local community.



The tsunami hit the beach at 10.15 in the morning. Photo By Emma Dilkes.

Naucrates normally conducts one mission each year, from May to September. However, Naucrates is currently conducting a second mission, from 4th January to the beginning of April 2006, in order to continue its conservation work. The second mission will focus on Post Tsunami evaluations, including:

- Conducting post tsunami evaluations of the status of marine turtle populations (nesting and foraging) and their habitats (including seagrass), including surveys and monitoring, with the support of the NOAA

Fisheries Service Office of International Affairs.

- Cleaning (debris caused by the tsunami), assessment and restoration of mangrove forests with support of North Andaman Tsunami Relief and Mangrove Action Project
- Assess the status of the coral reef at Ko Pring and monitor its recovery.
- Conduct community outreach and an Environmental Education Programme at Tapayoi school, providing lessons on conservation, basic English, and promoting awareness of the value and threats to coral reefs.

This study aims to collect preliminary data utilizing specific tools in order to be able to evaluate mid-long term changes in the ecosystems affected by the tsunami. The physical alteration or degradation of habitats such as mangroves, wetlands, seagrass meadows, beach forest, savannah, coral reefs, and tidal flats directly affects the quality of the marine environment and the health of marine living resources.

Most seagrasses in the area are intertidal, coming to the surface during low tide, in particular spring tide. It is likely that there are significant areas of subtidal seagrass. Naucrates plan to survey the seagrasses of the area and establish Seagrass-Watch long-term monitoring sites. The main reason for doing this is that it is a foraging area for juvenile sea turtles and dugong. Only a few animals remain, but it is probably the biggest seagrass area left in the region. Seagrass-Watch will help provide technical expertise on mapping and monitoring, including assisting with the analysis and interpretation of findings.

For more information, please visit www.naucrates.org.



AFTER TSUNAMI Turtle nesting beach Phra Thong island. Photo By Emma Dilkes.

Kho Phra Thong

Phra Thong Island, (about 100 km²) is situated in Phang Nga province, on the west coast of southern Thailand, about 200 km North of Phuket. It is part of a group of three islands near the mainland. The eastern coast of the island is covered by mangroves, while fine sand beaches (total length 15 km) occur on the western side.

Flora and fauna are still natural and rich in number of species. The island doesn't have electricity or roads. Tourist development is limited to three small resorts made with local materials.

The tsunami completely destroyed all the resorts and one of the three fishing villages of the island. International organizations and Thai Government are working towards the rebuilding of the local community livelihood.



Indonesia

Seagrass meadows in Indonesia - how important for fish?

Stuart Campbell (WCS) reports

The Wildlife Conservation Society (WCS) and marine park rangers from the Department of Forestry and Conservation have conducted assessments of seagrass ecosystems in Karimunjawa Marine National Park in Java, Indonesia over the past 3 years. The seagrass meadows were mapped in November 2003, and 9 sites representing different seagrass habitats have been chosen for monitoring within the park. In October 2005 monitoring of both seagrass and fish were conducted because local communities and park rangers wanted to know the importance of different seagrass meadows for fish, compared with adjacent coral reefs. The composition of reef fish species in different types of seagrass meadows (eg. *Enhalus acoroides* dominated vs *Thalassia hemprichii* dominated meadows), were more similar to each other than with the composition of reef fishes in coral reefs. Coral reefs had the highest diversity and numbers of reef fish, but seagrass and transitional areas (areas between seagrass and corals) were very important habitat for rabbitfish (food source), wrasses (reef grazers), damselfish and fast swimming, silver colored fish called majorras. The seagrass areas were also important nursery areas for parrotfish, cardinal fish and coral breams. Seagrass and fish monitoring will continue annually to assess the effectiveness of new protection zones declared inside the marine park. ♡



Etwin Sabirini - WCS seagrass scientist checking out the *Enhalus acoroides* meadows on the west of Karimunjawa Island.

Operation Wallacea 2006

Operation Wallacea now includes Seagrass-Watch within its Sulawesi scientific conservation expeditions.

Operation Wallacea is a series of biological and social science expedition projects designed to underpin the achievement of specific wildlife conservation aims. The expeditions operate in 5 countries: Indonesia, Honduras, Egypt, Cuba and South Africa.

Operation Wallacea first started in Sulawesi (a part of Indonesia known as the Wallacea region) in 1995, the objective to utilise volunteer effort to help complete rapid assessments of large areas and identify those worthy of protection. This survey work resulted in the Wakatobi Marine National Park, the second largest marine protected area in Indonesia being gazetted in 1996 and the Lambusango forests also receiving protection. Since then the Sulawesi Expeditions have included marine research and monitoring component.



Three types of volunteers are accepted onto the programme: General Surveyors, Research Assistants and Dissertation/Thesis Volunteers. The General Surveyors are usually teams of High School students



accompanied by their science teachers who undergo a specific training course to complete a particular type of data collection. Research Assistant volunteers are undergraduate or graduate level and are able to select from a range of options available in each of the countries so they can help with the more complicated data collection exercises. Dissertation/Thesis Volunteers will spend most of their time on site gathering data for their Honours, Seniors or Masters level dissertation/theses.

Staffing for the projects is drawn from UK universities (eg Oxford, Cambridge, Durham, Imperial etc), European universities (eg Trinity College Dublin, Lyons etc), US universities (eg Boston, West Florida, NYU, Colorado State etc) and other academic institutions. In 2006 there will be a 100 strong team of biologists, environmental scientists, geographers, social scientists and anthropologists together with expedition photographers and artists, expert trackers and forest support teams, diving staff and extensive logistics teams to support the wide range of projects completed.

The marine component is based at the Hoga Marine Research Centre, in the centre of a triangle of reefs in eastern Indonesia which are the most biologically diverse reefs in the world. After first completing a brief course on Indo-Pacific Coral Reef Ecology, volunteers can select from a number of courses, including "Seagrass & sandflats ecology & exploitation", which assesses the productivity of reef flats and seagrass meadows. During this course students learn the biological and economic importance of reef flats and seagrass meadows, and help doctoral students with a detailed monitoring programme around Kaledupa island. During the 2005 season volunteers successfully mapped a section of the seagrass surrounding Hoga using the Seagrass-Watch protocols. Volunteers joining this project during 2006 will expand upon this, mapping areas surrounding the local center's of human population most at threat from overexploitation. This seagrass productivity project encompasses a diverse array of additional small projects that volunteers on this project may have the chance to join. Research for 2006 will include specific fishery orientated studies on the key fish species inhabiting these habitats; catch analysis of specific seagrass fisheries; and laboratory studies on photosynthetic productivity.

There are 4 expeditions in 2006, First expedition starts 28 June 2006 from Makassar and expeditions range from 2-8 weeks. For more information and prices visit their website <http://www.opwall.com/> ♡



Philippines

Roxas, Palawan

A three day training workshop on seagrass resource assessment was held at Caramay Barangay Hall, Roxas, Palawan in early December, 2005. Ms Hildie Nacorda (Marine Science Institute, University of the Philippines) was the trainer.

The objectives of the workshop were to provide the participants with current knowledge on seagrasses, to acquaint them with present scientific and community-based initiatives for seagrass conservation, to conduct a field demonstration, and to provide the participants with basic approaches to analyze field data.

The first two objectives were addressed during the lecture on the first day, fieldwork and post-fieldwork data encoding were carried out on the second day, and then further data consolidation, analyses, and interpretation were discussed on the third day. Recommendations were also drawn from the field exercise and expectations for the next monitoring work were set.

On day 1 participants were given a lecture on seagrass importance, stresses, management concerns, world and local seagrass conservation initiatives, taxonomy, and methods of assessment and monitoring (following the protocol of Seagrass-Watch).

On day 2, the field component of the training was held in Brgy. Tinitian located ~14 km south of the training base and which has been identified as a potential ECAN core zone.

After anchoring the boats, a practice exercise on seagrass identification was first undertaken. Participants were split into 3 groups, and asked to find all species they could in the area and identify them. Species recognized by the groups were *Enhalus acoroides*, *Thalassia hemprichii*, *Halophila ovalis*, *Cymodocea rotundata*, *Cymodocea serrulata*, *Halodule uninervis*, *Halodule pinifolia*, and *Syringodium isoetifolium*. After which, an intertidal site was selected and each of the groups were assigned a transect which they then proceeded to monitor.



Participants of a subgroup making their own observations on their first quadrat sample.

Vegetative cover was good, overall, with seagrasses contributing over 50% on average (range 5 to 95%). Seaweeds, largely the green algae *Halimeda*, covered only 3% of the bottom, and epiphyte cover on the seagrass leaves was also negligible. *Thalassia hemprichii* dominated the meadow.

Flowering was observed for *E. acoroides* and a large number of invertebrates and fish were recorded across the site.



On day 3, back in the base, the subgroups submitted a copy of the completed datasheets to the trainer, which was checked for accuracy. Practical questions were thrown to some participants during the submissions. Thereafter, accomplished data sheets on the modules were countersigned.

Proceedings of the field activity were presented on the third day, where data from each subgroup were also consolidated onscreen, i.e., for everyone to see and subsequently react on. Ranges and means of all parameters obtained in the field were summarized. Rodel Arcaño presented this summary after a short introduction by Juliet Roa.

Apart from the planned activities for the monitoring in March/ April 2006, the following tasks are suggested for future inclusion:

1. Determine the perimeter (boundaries) of the meadow,
2. Determine water depth on the boundaries,
3. Create an updated map of the extent of the meadow (after completion of activities 1 and 2),
4. Assess the occurrence of other encountered species, including those not recorded within the observations quadrats, and
5. Determine the tidal profile in the area.

Overall the training exercise was a resounding success and the trainer has high opinion of the group, beginning with their enthusiastic preparations for the fieldwork, analytical perception of the monitoring activity, their unequivocal determination in accomplishing the tasks, and their group effort during data encoding and analyses. The group is now a core participant of Seagrass-Watch in Palawan. 🌱





Papua New Guinea

Kavieng (PNG)

John Aini (Ailan Awareness) reports

Seagrass-Watch in Kavieng has been off and on over the past year due to movement of teaching staff and trained people, although the sites (Lavongai LV1/LV2), Panamecho PO1, Bol BL1) are still known to people in these communities as seagrass monitoring sites. Our problems have been our ability to conduct follow up visits and maintaining dialogue with these communities.

One of Ailan Awareness tasks is the implementation of the community-based fisheries management program, and we see Seagrass-Watch integrating well within the program. Recently people from the west coast voiced interest in such monitoring programs and have specifically mentioned Seagrass-Watch. I have managed to establish 7 management areas and I am looking at linking Seagrass-Watch in with sea cucumber (bech-de-mer) monitoring. We are also planning to map seagrass in all 7 (the number will probably increase in the next two months) of the management areas. Hopefully we will not have issues with people moving/leaving, as these communities have appointed permanent fisheries management committees to oversee the management areas and take a lead in monitoring. Ailan Awareness would play the advisory role (e.g., maintain dialogue, do periodic visits and give some feed back to them), which will hopefully be ongoing.

In schools and communities, seagrass awareness is ongoing where we touch on various marine ecosystems and try to explain their importance, connectivity and the threats they may or will face. In all but one of these management areas there are schools and we may be able to encourage teachers and community fisheries management committees to come together with a shared vision of protecting these resources and the products they yield. 🌱

Seagrass-Watch and the Motupore Island, WCS Marine Training Course



Jane Wia (Research and Training Officer, Motupore Island Marine Biodiversity Unit)

In February 2006, the Wildlife Conservation Society (WCS) conducted its annual marine conservation and management training course at Motupore Island, Papua New Guinea (PNG). It was conducted with assistance from the David and Lucile Packard Foundation, the National Fisheries Authority's Coastal Fisheries Management and Development Program and the Motupore Island Research Centre (MIRC), School of Natural and Physical Sciences, University of Papua New Guinea (UPNG). Participants included UPNG students and representatives from various government departments and non government organisations.

The course coordinator was Michael Marnane (WCS) with specialist input from Chris Bartlett (WCS) Morgan Pratchett (JCU), Mark Baine (MIRC), Ursula Kaly (CFMDP), Thomas Maniwavie (MIRC), and Len McKenzie (DPI- QLD).

The month long course provided participants with practical training and knowledge on marine conservation and

management. Topics covered included: corals, reef fish, macro-invertebrates, mangroves, seagrasses and fisheries. Participants received instructions on (1) how to conduct surveys to monitor and assess these resources and (2) how to identify and manage any threats. Len McKenzie conducted the seagrass component of the course, within which the participants learned general seagrass ecology and were instructed on the monitoring and rapid assessment of seagrasses according to Seagrass-Watch protocols. A lasting legacy from this year's course was the establishment of permanent peg at Motupore Island to enable the continued quarterly monitoring of seagrass communities by MIRC personnel. A herbarium was also set up with specimens of seagrass species collected by the participants during the course.



Rhoda identifies the seagrass species from the reef flat of Motupore Island during the taxonomy lab session.

MIRC has also received 2 years of funding from the David and Lucile Packard Foundation to help build PNG's capabilities in marine biodiversity conservation and research. To this end, the Motupore Island Marine Biodiversity Unit (MIMBU) has been established and has the primary role of developing a marine biodiversity database for PNG. Collaboration with Seagrass-Watch will assist that process.



*Above: Aileen, Rhoda, Rongo, Selma, Susan & Freda at BT1
Left Susan estimates seagrass abundance
Below: Fidel, John I, John V, Chris, Robert & John A monitor transect 1.*



*Above: Students learn the background of Geographic Positioning Systems (GPS)
Right: Practising using a GPS in the field, before mapping the seagrasses around Motupore Island.*



With regard to seagrass research, Motupore Island is the site for some of the earliest studies on seagrass ecology conducted in the Indo-West Pacific and boasts a total of 10 species, three less than the reported total for the whole country. 🌱





Cawaci, Ovalau

Shaun Ashley reports

Upon embarking on our first Seagrass-Watch survey this year, changes in the two sites (CW1 and CW2) were immediately noticeable. The major change noted by the three observers was a significant increase of macro-algae over both sites. It is unclear what may have caused this increase, but we are sure it is related to sewage and urban runoff from the adjacent school and associated housing.

Other noticeable changes observed at the sites included the general absence of some seagrass species. It was evident that the seagrass species of *Halodule uninervis* (HU) and *Syringodium isoetifolium* (SI) were hardly seen growing in the two sites, compared to previous monitoring events. A large patch of *Halodule uninervis* (HU) was located growing 5 meters north west of quadrat 45 in CW1.



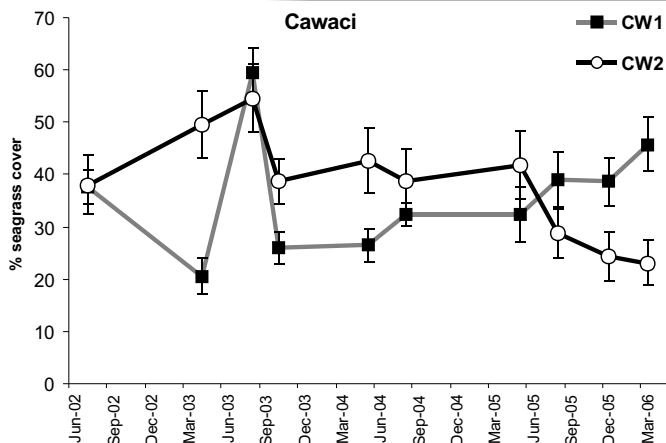
We feel these changes may be a consequence of the high macro-algal cover present in the site and the hotter than usual weather currently being experienced in Levuka over the past couple of months.

Through our participation in Seagrass-Watch, we are now more aware of our environment and more observant of possible threats. ♡



Ovalau Island and surrounding barrier reef. Levuka in the foreground and Cawaci at the top

L-R: Yuki (visiting Japanese student), Shaun and Charlene monitoring CW1.



Laje Rotuma Youth members receive Commonwealth Silver Award

Congratulations to the Laje Rotuma Youth Members, who on Mar 3, 2006 were presented with the 2005 Commonwealth Youth Silver Award.

The Commonwealth Youth Programme Silver Award, is in recognition of contributions made by young people to the development of their community. Projects submitted for the award had to be in existence for at least two years and were judged along certain criteria, some of which were the extent of the involvement of young people in the initiation and planning of projects. The originality and relevancy of the project, in meeting the needs of the community, gender equality and sustainability of the projects is also taken into consideration.



The winning project titled, "An Environmental Awareness Programme in Rotuma" is based on environmental education, awareness and conservation programme primarily targeting the youths living on the island.

It was developed to inform and strengthen the capacity of the island communities on natural resources management and conservation with particular emphasis in marine life. ♡



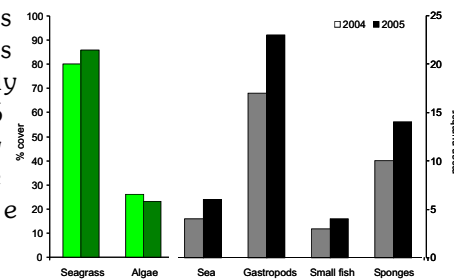
Seagrass Survey

In late 2004 and 2005, Alfred Ralifo conducted seagrass monitoring in the *Syringodium isoetifolium* in Motusa Bay, Rotuma. *S. isoetifolium* is the only species of seagrass found in Rotuma.



The results showed that the percentage seagrass cover has increased by 6% from 2004 to 2005, an indication that the seagrass meadow is relatively healthy. There was a reduction in the percentage epiphytic algae and other types of macroalgae in the seagrass meadow - a good sign of reduced nutrients.

Another good sign is that the mean number of animals found in the seagrass meadow has increased slightly from 2004 to 2005 and directly correlates to the increase in the seagrass cover. ♡



Sea Turtles

Green turtles - seagrass grazers at risk

Julia Hazel (James Cook University)

The plight of sea turtles has drawn increasing conservation attention in recent decades, with growing recognition of diminished populations and the worldwide array of detrimental human impacts they face. Coastal development compromises some important turtle nesting beaches while introduced predators decimate eggs and hatchlings in other places. Many turtles and turtle eggs are harvested for food or trade, more are killed unintentionally in fisheries, and turtles that evade these major threats must contend with ever-increasing human activity in their vital foraging grounds.

My PhD research addresses just one aspect of this complex problem, vessel strike. Boat operators sometimes unknowingly run over turtles (and less frequently dugongs) and the number of animals killed and maimed this way in Queensland is not trivial. Moreton Bay has recorded the highest death toll, followed by Cleveland Bay and Hervey Bay. Green turtles (*Chelonia mydas*) are the most frequent victims, possibly because they rely on seagrass as a major food resource. This leads them to spend much their lives in relatively shallow coastal waters where seagrass is abundant, and where vessel traffic is sometimes intense.

I began with a study of green turtles' responses to a vessel approaching while they were foraging on seagrass beds in clear water. Results confirmed that speed matters and it matters a lot. The majority of turtles could detect and evade a vessel approaching at 2 knots, but at 6 knots more than half did not react in time. At 10 knots, the fastest experimental speed I used, almost all turtles (95%) directly in the path of the vessel failed to respond.

Implications of this finding are daunting, considering that many recreational and commercial vessels in Queensland routinely exceed 10 knots, and the prospect of limiting waterborne traffic to 2 knots (slow idling speed) would be unacceptable on a broad scale.

My next objective is to investigate whether there are patterns in green turtle behaviour that could allow us to differentiate accurately between situations of low and high risk for vessel strike. If that turns out to be feasible, then it might be possible to determine where changes to vessel speed or routes could offer the greatest increase in turtle safety, with least inconvenience to boat operators.

I have started tracking the fine-scale movements and diving patterns of individual green turtles and am currently striving to improve my methods for this very challenging task. I hope to

include an evaluation of the study turtles' food resources after I have identified sites they regularly favour, and I'm looking forward to meeting more seagrass watchers, especially those familiar with the shores of south-western Moreton Bay where I'm conducting this study. ♡

IOSEA Year of the Turtle 2006

The Indian Ocean - South-East Asia (IOSEA) 'Year of the Turtle 2006' was officially launched on 1 March 2006, and will run through to the end of 2006. The YoT campaign aims to unite nations and communities to celebrate marine turtles and to support their conservation. While increasing public awareness and understanding of the threats faced by marine turtles, the campaign will also highlight the work of dedicated organisations that are striving to conserve these ancient creatures and the habitats on which they depend.

The IOSEA Memorandum of Understanding (MoU) puts in place a framework through which States of the Indian Ocean and South-East Asian region, as well as other concerned States, can work together to conserve and replenish depleted marine turtle populations for which they share responsibility. The species of marine turtles covered by the MoU are: the Loggerhead *Caretta caretta*, Olive Ridley *Lepidochelys olivacea*, Green *Chelonia mydas*, Hawksbill *Eretmochelys imbricata*, Leatherback *Dermochelys coriacea*, and Flatback *Natator depressus*. The IOSEA Marine Turtle MoU Secretariat is co-located with the UNEP Regional Office for Asia and the Pacific (UNEP/ROAP), in Bangkok, Thailand

The Year of the Turtle is being organised around a number of core themes: celebrating marine turtles, taking measures to ensure their long-term survival, conserving marine turtle habitats, reducing accidental capture in fishing operations, and encouraging applied research. These objectives are meant to guide the campaign activities at national and local levels throughout the year.

Everyone can be involved: you can search the online YoT Event Calendar to find out about interesting activities and events, develop a new initiative, or associate an ongoing activity with the YoT campaign, using the official YoT logo.

It is hoped the campaign will be a milestone in the conservation of marine turtles and their habitats of this vast region.

For more information about the YoT, visit <http://www.ioseaturtles.org/> ♡



This green turtle was about to return to its seagrass foraging area in Moreton Bay after I attached a tracking tag to the rear of its carapace. At the right hand edge of the picture you can just see the tag, a small red float that carries an ultrasonic transmitter and miniature depth recorder.



A Green Turtle feeds on *Cymodocea rotundata* at Green Island; a popular feeding ground and location of 2 Seagrass-Watch long-term monitoring sites.



Western Australia

Protecting Roebuck Bay

Danielle Bain (RBWG) reports

Seagrass-Watch is pleased to announce its partnership with Environs Kimberley and the Roebuck Bay Working Group (RBWG), to establish seagrass monitoring at Roebuck Bay, Western Australia.



Community groups, government and industry have initiated a community based planning process for Roebuck Bay. The group, called the Roebuck Bay Working Group (RBWG), aims to progress management planning for the protection of Roebuck Bay's values through community based management planning. The RBWG is a collaboration of Traditional Owners and representatives, government agencies, industry, community and local government, with Secretariat support provided by the Kimberley Land Council.



Located on the coast adjacent to Broome, Roebuck Bay holds a great diversity of cultural and natural heritage values for all peoples. Covering an area of approximately 66,000ha, much is intertidal mudflats with a rich diversity of marine life. The mudflats, together with big tides, mangroves, red cliffs and aqua blue water, makes Roebuck Bay a natural and visual wonder. The intertidal mudflats of Roebuck Bay have been identified as one of the world's richest habitats for feeding wading birds and is Ramsar-listed for its global significance.

Although tropical mudflats are renowned for being important wader stop-over sites for feeding, very little is known about them. Roebuck Bay has only received attention in the last ten years. Two large expeditions (1997 and 2002) discovered hundreds of species living in the soft bottom sediments. However, there is little information available on seagrasses in Roebuck Bay and the Broome regions. The seagrasses have not even been mapped.

Interconnected with the rich biodiversity of Roebuck Bay is the powerful spiritual attachment to this coastal country by Aboriginal people for millennia. The Bay plays a significant part in the daily life of local Aboriginal people, not only by providing food but also in maintaining customary practices and linkages and in the maintenance of their culture. One way which has been suggested to ensure protection of Dugongs would be a Dugong sanctuary under joint management by CALM and local Aboriginal communities.

Through activities such as tourism, commercial fishing, aquaculture and the port, the Bay also contributes significantly to the commercial viability of Broome. Together with important recreational values, these uses have a strong reliance on the health (and biodiversity) of Roebuck Bay.



However, with a rapidly growing and mobile population and the increase in tourism activity, pressures on the area are rapidly increasing.

With these increasing and often competing pressures comes a



Roebuck Bay as seen from the International Space Station

photo by NASA



need for well-planned and coordinated management of the whole area - the Bay and its surrounding ecosystem. It is because of this need that people from different interests and backgrounds, have come together to form the Roebuck Bay Working Group (RBWG) which is ultimately working towards the development of a Management Plan for the bay.

For further information, contact Emily Burke (RBWG Secretariat), by email at minyirrparkbroome2@klc.org.au or phone: 08 9194-0150

Environs Kimberley



Environs Kimberley (EK) is a locally based, independent environment group working in the northwest of Western Australia. Based in Broome in the West Kimberley, EK was initially formed to campaign against a proposal to dam the Fitzroy River for an irrigated cotton plantation. It has remained an effective and tenacious advocate for the environment and people of the Kimberley ever since. Its vision is "to preserve and respect the intrinsic values and qualities of the Kimberley region."

EK currently has a shorebird monitoring project in Roebuck Bay. The project aims to quantify the disturbance to migratory waders (e.g. raptors, people, dogs, cars, and helicopters) to determine which kinds of disturbance pose the greatest threat. Volunteers go out a few times each month to sit and watch the birds for four hours at a time and record what disturbs them. At the same time, people around the bay are interviewed to find out what they use the bay for, and to ask about their own personal experiences with the waders.

In July 2002, Environs Kimberley ran an event called 'Celebrate the Bay Day,' which emphasised how local actions can have global significance. This day-long event highlighted the importance of Roebuck Bay and involved participants from state and local government, researchers from around the world and community groups. The event had been organised by EK not to ward off urgent threats to the area, but to inform members, researchers and the broader community of its significance and fragility, and invite all participants to work toward partnerships in the preservation and respectful use of the Bay. In June 2006, there will be another Celebrate the Bay Day which will aim to educate key stakeholders and the wider community about research taking place in the bay. It will also provide the opportunity for the community to participate in the planning process which is currently being undertaken by the Roebuck Bay Working Group.



photo by jampert

New South Wales & Victoria



The Community Seagrass Project NSW



Rebecca Small (Seagrass Project Officer, Community Environment Network (CEN))

Much has been done in NSW over the past few months to strengthen the program in New South Wales. Our friends in the South of NSW have been generating interest furthering the workshops conducted in 2005. Many groups have started planning and further training of local residents in an effort to maximise the program.

Planning is underway for workshops along the North Coast of NSW with an overwhelming interest from Local Councils and community groups! Workshops are tentatively planned for May / June 2006 for most areas.

Workshops in the Sydney / Metropolitan area are set with a huge thankyou to Charlie Hewitt from CoastCare for his co-ordination and planning, as well as many local and government representatives.

Monitoring sessions in Lake Macquarie at Coal Point have started with much interest in the program! The enthusiastic group have also agreed to expand to another two monitoring sites within Lake Macquarie.

Monitoring sessions at The Entrance on the Central Coast have been conducted twice, with this site set up as a training with early findings showing changes in seagrass density over the holiday period. This area is a popular tourist destination and fishing spot and is an important Whiting breeding ground. ♡



Launch of the Sea Search Seagrass Community Monitoring Program at Corner Inlet Marine National Park.

Rebecca Koss, Sea Search Project Officer

On Monday 12th of December 2005, the Sea Search Corner Inlet Community Seagrass Monitoring Program was launched at the Old Ferry Terminal, Port Welshpool. The Sea Search program was established by the People & Parks Foundation, in conjunction with Parks Victoria, with sponsorship from ExxonMobil. There are three main Sea Search monitoring programs undertaken by community groups in Victoria's Marine National Parks and Marine Sanctuaries. The three programs include monitoring of intertidal rocky shores, subtidal rocky reefs and seagrass meadows.

At Corner Inlet Marine National Park the local community group, Friends of Corner Inlet, currently undertake monitoring of *Posidonia australis* seagrass meadows. This monitoring was initiated in 2004 (please see previous articles in Seagrass-Watch News) with the local Parks Victoria Ranger, Jonathon Stevenson. This ongoing monitoring will now expand to include a number of additional sites throughout Corner Inlet. This will allow a comparison of seagrass meadow health in protected and non-protected areas. The launch of the Sea Search program builds on strong existing links between the local community, The People & Parks Foundation, and Parks Victoria, allowing the local community to be involved with the management of their local Marine National Park.



Ongoing seagrass monitoring in Corner Inlet Marine National Park will occur seasonally through the year by S.E.A.L. Diving Services, The People & Parks Foundation Sea Search Project Officer and the local Parks Victoria Ranger. Future Sea Search seagrass monitoring programs will be initiated in Westernport Bay.

For information on Sea Search, visit the website: www.seasearch.org.au or contact the Sea Search Project Officer by email: rkoss@parks.vic.gov.au For information on the People and Parks Foundation, visit the website: www.peopleandparks.org ♡

UPCOMING EVENTS-

Community Seagrass Monitoring Workshops
Sunday 2nd April 2006; St George Sailing Club, Riverside Drive, Sandringham

Saturday 8th April 2006; Manly Library, Manly Market Place.

Ongoing; The Entrance, Central Coast

Contact: Rebecca Small on 02 434843207 or Email seagrass@cccen.org.au

Central Coast
Community
Environment
NETWORK



Sea Search

Community-based monitoring of
Victoria's Marine National Parks & Marine Sanctuaries



Torres Strait - Queensland



Torres Strait Update

Beccie Bowie and Ina Mills were selected from their student body to represent Torres Strait Islander youth at the NAILSMA (North Australia Indigenous Land and Sea Management Alliance) Youth Forum held recently in Darwin. These students had no hesitation in saying that they felt that they were awarded this opportunity because of their involvement in Seagrass-Watch.

As part of the forum the girls presented a short talk entitled TI High Natural Resource Management Experiences and Opportunities. They talked about the scientific skills they had learnt from participating in Seagrass-Watch, and how their participation in this program had led to other opportunities such as traveling to the Whitsunday and Sarina areas to meet other seagrass-watch volunteers and to observe other seagrass meadows outside of the Torres Straits. They felt that their participation in Seagrass-Watch had shown their teachers their commitment to learning about marine resources which had led them to being chosen to participate in turtle tagging on Millman Island (a QPWS and Earthwatch initiative) and the Youth Forum. 🌱



Beccie and Ina preparing their talk while Christie watches on



Beccie and Ina practice their talk at Horn Island Primary School

Horn Island



Wongai Beach (HI1)

After a quick refresher on Seagrass-Watch protocols and seagrass identification for "Torres" Class, students joined the Thursday Island High School students to monitor the Seagrass-Watch site at Horn Island. This was the first time this site has been monitored this early in the year. There were two features that stood out during this sampling period. Firstly the large amount of algae covering the seagrass and the large number of small sea hares that were found amongst the seagrass. These animals also called sea slugs were difficult to spot at first as they are well camouflaged. However, the tell-tale purple dye they released when trodden on gave their presence away. They have a soft body, a small internal shell and large tentacles which are thought to resemble the large ears of a hare hence their common name 'sea hare'! 🌱



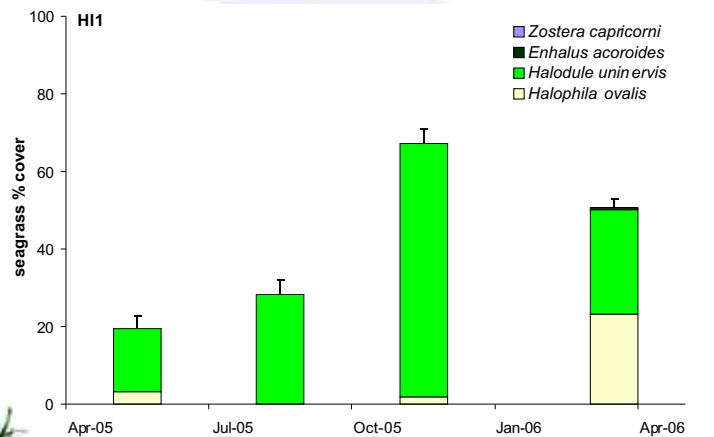
Above: Beccie, Ina and Christie
Above left: Apres School monitoring at Wongai Beach



Left: Beccie estimates species composition at HI1



Below left: Careful!!
Below: Horn Island Primary School seagrass identification refresher.



Torres Strait - Queensland

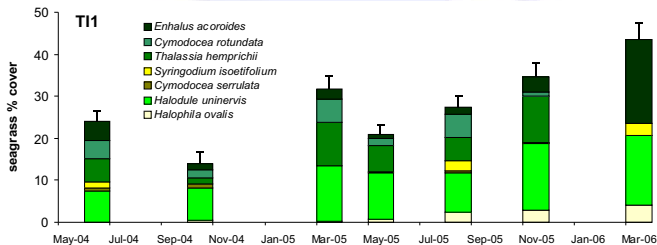
Thursday Island

Front Beach (TI2)

The most noticeable thing about sampling at Front beach this month was the amount of sediment that had been moved around. In places where there had previously been hard sand there was rubble and in other areas the sediment had built up to the point that we were lucky to find the site marker (see photo). Other notable features occurring within the meadow were the flowering of *Enhalus*, the large number of sand dollars and the presence of a large sea hare. Whilst these features did not occur within any of our quadrats we note the presence of an anchor chain through one of our quadrats!!!!!! Luckily it wasn't the boat as that would have been interesting obstacle to overcome. 🌱



Above: Only the yellow site marker is visible, as the peg is covered by sediment.
Left: storm waters from a heavy downpour flood over the site



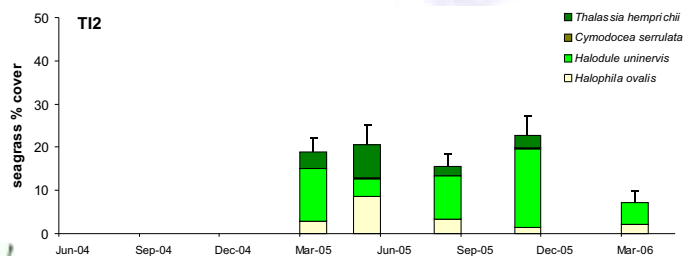
Top right: What a whopper!!! A giant sea hare and a sand dollar
Above right: Do we estimate percent cover of the anchor chain???
Above left: Carla and Kristie doing their thing at TI2
Top left: Kara and Shakira monitoring Front Beach

Back Beach (TI1)

There was a huge turn out for Seagrass-Watch this month, thanks to some very enthusiastic Marine Studies students, and they weren't disappointed. There were lots of *Enhalus* flowers and fruits to observe, a single plant of *Halophila spinulosa* was found (a first for this site) and heaps of *Cassiopea* the upside down jellyfish present. These invertebrates get their name because they spend most of their lives laying upside down on shallow sandy bottoms exposed to sunlight. Among the frilly tentacle structures are rounded, bladder-like structures, which contain photosynthetic algae (zooxanthellae) that help the jellyfish produce its own food. Whilst these jellyfish do produce their own food they will opportunistically eat any small animals that pass over them by paralyzing them with their nematocysts (specialized stinging cells). Most of the Seagrass-Watchers can attest to these jellyfish having stinging cells as they were continually being stung as they walked along their transects. Whilst, it was a mild sting it was still annoying. 🌱



Top L: Back Beach Seagrass-Watch all systems go!!
Top R: Kristie, Caitlin, Stacey and Susan
Centre L: Kinam, Sinita and Shakira
Centre R: The boys seem to have the hang of it, Tess, Jade and Lisa not so sure!!!
L: Our youngest recruit??
R: *Cassiopea* at Back Beach





Cooktown

Christina Howley reports

Greetings from Cooktown! Our local Seagrass-Watch group is in its third year of monitoring seagrass meadows at Walsh Bay just south of Archer's Point in the Cooktown region. Monitoring near Archer's Point began in October 2003 with myself, Sam DiBella (then the local QPWS/Marine Parks ranger), and teachers and students from the Cooktown State School biology class. Unfortunately the Cooktown area no longer has a local Marine Parks ranger (!), but we have had a number of new volunteers join the Seagrass-Watch group, including enthusiastic residents from the Archer's Point catchment area. In addition to the on-going transect monitoring, for the past year local biologist Jason Carroll and I have collected sediment & seagrass samples for nutrients, herbicides & reproductive health as part of the Reef Water Quality Protection Plan.

The Archer's Point catchment area is primarily National Park. Anthropogenic impacts are minimal with only a few scattered residents, low-density cattle grazing and occasional burning of National Park lands. The meadows we monitor are dominated by *Halodule uninervis* and *Halophila ovalis*, with *Cymodocea serrulata* and *Cymodocea rotundata* occurring in some places. Within the larger Walsh Bay area we have also identified *Zostera capricorni*, *Enhalus acoroides*, *Syringodium isoetifolium* and *Thalassia hemprichii*. Seagrass coverage usually averages between around 15-35%, with coverage at some quadrats as high as 80%, or reduced to 0% due to bare patches left behind by sting rays. We often come across dugong trails and many other organisms including the unusual mantis prawn. We are looking forward to heading back out to the beautiful Walsh Bay in April with the High School biology class. 🌱



Christina Howley (right) oversees the monitoring

Walsh Bay - location of Seagrass-Watch monitoring sites AP1 and AP2



The last quadrat!!!

Hervey Bay

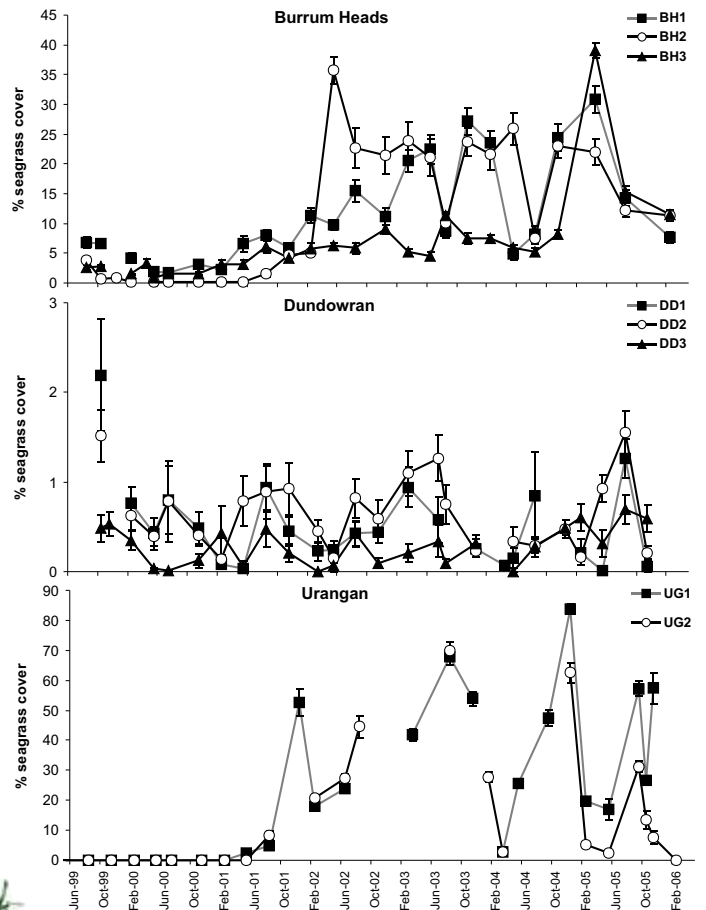
Trischelle Lowry Report



Our small, but enthusiastic band of volunteers undertook monitoring in February of the 13 sites across our region. Abundance of seagrass has declined across the board with a significant drop in percentages at the Urangan (UG) sites.

UG3 was extremely sparse, which is a substantial difference to August 2005 monitoring when percentages were the highest recorded since the establishment of this site in late 2001. Examination of the UG2 site revealed similar scenes. This site has gone from supporting *Zostera* of 30cm in length (Oct 2005) to the only seagrass now present being small isolated patches of exposed rhizomes.

Monitoring of UG2 usually entails frequently sinking to the knees in mud, however the site now seems to be covered with a layer of sand, meaning that transversing the area only resulted in occasionally sinking to the ankles!! Other volunteers also noted similar deposits of sand across monitoring sites at Burrum Heads and Dundowran. This sand movement and subsequent burial of seagrass, along with recent high temperatures, possible factors for the decline across the region. 🌱





Queensland

U3A gets involved

Don Kinsey (U3A) reports



U3A (University of the Third Age) is a worldwide voluntary education movement primarily targeting retired people. Its members tend to be enthusiastic about nearly everything, which is a great start to any new activity.

The new U3A on Magnetic Island sampled Seagrass-Watch in October 2005. As a result of that afternoon of fun and incompetence it was decided that the U3A's Oceans and Coastal Zones course participants would like to undertake a formal, ongoing commitment to monitor the Island's Cockle Bay seagrass site. 16 class members have formed the Cockle Bay team, which gives us quite a bit of flexibility. Most of the team have now done a Seagrass-Watch training Workshop and the team has set up three separate transect working groups to facilitate the monitoring.

Unfortunately, our January monitoring had to be cancelled as the Island had just received the magnificent and much needed rainfall of nearly 800 mm. Our team, champing at the bit, finally got to carry out its first essentially independent (Jane was there to watch but not manage!!) monitoring session on 28/2/06. The tide was a bit marginal but the afternoon's activity went really smoothly and all tasks were completed in little more than an hour because of the large team and the well-organised groups. Everybody had a great time and our continuing enthusiastic involvement in Seagrass Watch seems assured. 🌱

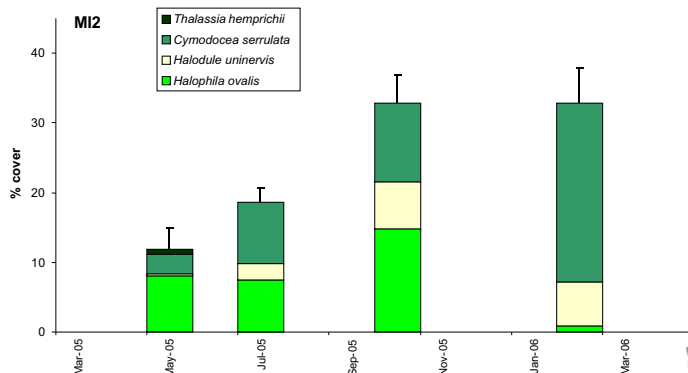


Top left: Barbara Kinsey prepares to take quadrat photos

Top right: The team estimates species composition.

Left: Don Kinsey (centre) leads the team on transect 2.

Centre: The new inventors - a seed corer for standing up



Sarina Inlet



On the 26th March, Len, Jane and Naomi from Seagrass-Watch HQ (DPI&F) conducted a workshop in Sarina, near Mackay in central Queensland. With the assistance of Matt Bloor and the Sarina Beach Progress Association

The training was funded by GBRMPA as part of the Reef Water Quality Protection Program. Twenty people attended the training day, with participants ranging from University students and retirees to representatives from conservation groups across the region.

Len McKenzie, Seagrass-Watch program leader, and scientist Jane Mellors gave presentations on seagrass identification,



biology, ecology, threats and the Seagrass-Watch program, including its background, methods and some of the results. Naomi Smith assisted with a lab session on taxonomy. Participants were interested to

learn not only about seagrasses, but how local participation makes them part of a global community.

After a morning of presentations, participants made their way down to the Sarina Inlet sites (SI1 & SI2), where the monitoring techniques were put to use.



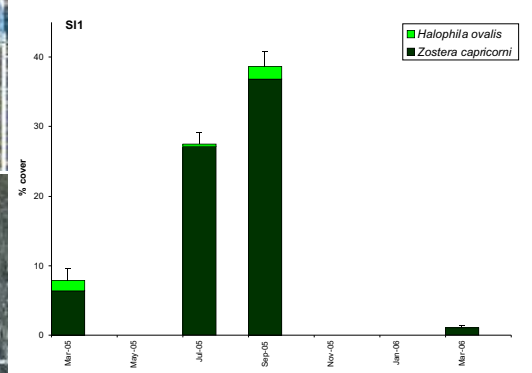
Dell Williams (second from left) from Seagrass-Watch Whitsunday's provides valuable assistance



Coastal & Marine Coordinator Matt Bloor (left) assists with training

Unfortunately, Sarina Inlet seagrass meadows are not looking particularly healthy, with abundances below 5%, significantly lower than the 40% covers reported in October 2005. Local residents suspect the cause of the decline was greater rainfall over the last few months and possibly higher temperature. Temperature loggers have now been installed at the sites, and Noel and John have offered to be responsible for their collection and deployment - thanks guys!!

Fortunately, the sites are also part of the RWQPP monitoring, so while visiting, Len, Jane and Naomi collected sediment samples from the site to check for herbicide residues. 🌱



Townsville Region - Queensland

Bushland Beach

Lux Foot (Northern Beaches Rotary) reports

The Bushland Beach group turned out in good numbers, 7 from the Rotary Club and 5 from the Townsville Group for the first sampling of 2006.

Unfortunately the monsoon trough and offshore winds increased the height of the tide, which made monitoring difficult. The recent rains also made the water muddy.

Nevertheless, seagrass and seeds were plentiful, also three *Lingula* were found while seed sampling. 🌱



Above: Naomi (DPI&F) (right) helps out

Above left: Jason, Rosie & Michelle

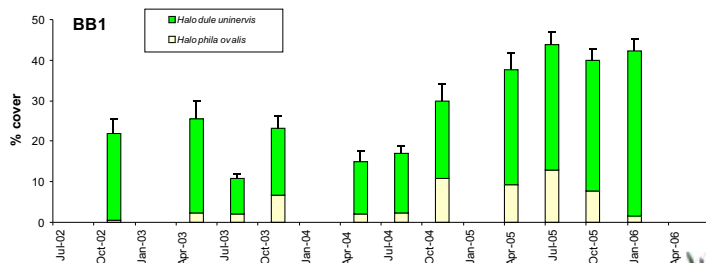
Right: Lux & Sharon sample seeds

Below left: Belinda ("Bubbles") & son

Below: Jason & Rosie



A productive fish habitat & Seagrass-Watch site - Picking up the crab pots

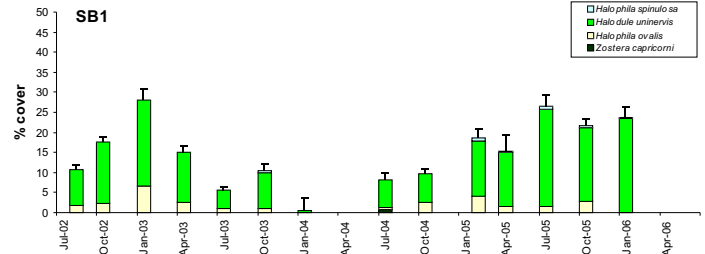


Shelley Beach

Naomi Smith (DPI&F) reports

Monitoring SB1 in January was cause for concern as Townsville had been hit by some rain and high winds. Luckily this ceased and Seagrass-Watch went full steam (yes that is right humid, hot and muggy) ahead. This meant sampling at midnight (due to suitable low tides) in the pitch black. This band of dedicated Seagrass-Watchers armed with torches and insect repellent trudged over the hill and across the rock strewn beach before arriving on site. Once at the site, I don't think any of us really realized just how much we needed the insect repellent as we had to fight off thousands of giant mozzies and other flying insects. What was worse is that the insects were attracted to our headlights, providing us as the midnight snack. So if you are looking for a new exciting challenge try a midnight Seagrass-Watch at your site! 🌱

Prepared for our midnight sortie.



Regional roundup

Other sites within the Townsville-Thuringowa Seagrass-Watch portfolio include MI1 (Picnic Bay), SB2 (Shelly Beach), SC1 and SC2 (Sandfly Creek).and RB1(Rowes Bay). Of these sites, Picnic Bay was monitored during a midnight sortie in late January between rain squalls and SB2 was monitored in early February. The SB2 monitoring event enabled a couple of watchers to complete their Seagrass-Watch training, as they were unable to take to the field during the Magnetic Island Workshop. Unfortunately the Sandfly Creek sites have not been monitored since July 2004, due to the difficulty of access to these sites. The site at Rowes Bay is yet to be monitored this year, but once the Rowes Bay rangers get back on board there will be no stopping them. 🌱



Experienced seagrass-watchers Dick, Catherine and James show Andrew, Ron and Posa what's what at SB2

Moreton Bay - Queensland

Mapping Seagrass in Moreton Bay.

By Chris Roelfsema and Stuart Phinn (UQ)

Last year Seagrass-Watch volunteers in Moreton Bay participated in ground-truthing satellite imagery in conjunction with the University of Queensland (UQ) as part of ongoing research projects to improve techniques for coastal management.

Stuart Phinn and Chris Roelfsema (Centre for Remote Sensing and Spatial Information Science) are applying remote sensing approaches in combination with field survey data similar to that collected by Seagrass-Watch, to map properties of seagrass meadows in the Moreton Bay region. The research is supported through the Coastal Zone CRC, an Australian Research Council Linkage project with the Healthy Waterways Program, and Chris's doctoral research.

A major part of this project was a field and image data collection campaign in July-September of 2004. During that period field data were collected in a combined effort by staff from the Ecosystem Health Monitoring Program (EHMP), CSIRO Land & Water, Queensland Parks and Wildlife Service (QPWS), UQ, Port of Brisbane and Seagrass-Watch volunteers.

The field data were collected at times to coincide with the collection of images of Moreton Bay from airborne and satellite sensors. These sensors are similar to your standard digital cameras, but have significantly higher pixel resolution and more spectral bands (colours per pixel). This enables us to look at the colour signatures in individual pixel images, which range in size from 2.4 m x 2.4 m to 30 m x 30 m, to work out the type of seagrass present and its level of cover.

Combining information from all the pixels allows us to map seagrass density or percentage cover, species composition and biomass in areas of shallow (< 4 m) clear water.

To develop and check the accuracy of our image based maps we need field data on seagrass density and composition at known locations in the study area. As our research focus is on the Eastern Banks area, the UQ team established 56 transects in this area in July 2004. Each transect was 100 m long and contained photos taken at 2 m intervals. The photos were analysed visually to determine species composition and % cover.

At each transect, two seagrass cores were collected to determine above and below ground biomass. All photos and cores had a known position in the field measured from a Global Positioning System. The seagrass cores were analysed by Seagrass-Watch staff (Louise Coles, Keira Price and Paul Finn).

In the deeper and more turbid waters of Moreton Bay the other teams collected field data (seagrass density and composition) using spot checks, through snorkeling or using a remote video camera dropped over the side of a boat. As all the field data were georeferenced to set coordinates, they were able to be mapped on top of the remote sensing images to create and validate maps of seagrass properties.

Maps covering all of Moreton Bay showing seagrass density (Figure 1, image and field survey) and species composition (field data only) were created with the help of Nicola Udy (QPWS). This map integrates outputs of image based mapping from the Landsat 5 Thematic Mapper sensor (12/8/04) for the Eastern Banks and some of the shallow, exposed areas in Western part of the bay (UQ), with field survey data collected by EPA, EHMP and Port of Brisbane Corporation in the exposed inter-tidal and deeper turbid western, northern and southern parts of the Bay.



Figure 1. Seagrass density map for Moreton Bay overlaid on a Landsat 5 Thematic Mapper image collected on 12th August 2004. The map is an integration of data from Eastern Banks (UQ) and Western, Northern and Southern Bay (EHMP, QPWS).

Currently, the UQ team together with Dr's Arnold Dekker and Vittori Brando from CSIRO Land & Water are conducting further research to determine which type of sensor and processing technique is most suitable for seagrass mapping. We have also just commenced a project with the Reef CRC to determine how well sparse seagrass can be mapped. Chris is conducting more research on the techniques used and their applicability in developing countries. The results of this work and ongoing research will be presented at international conferences and in international journals. The contribution of Seagrass-Watch volunteers to this work is greatly appreciated.

Please contact Stuart (s.phinn@uq.edu.au) or Chris (c.roelfsema@uq.edu.au) if you want further information. ♡

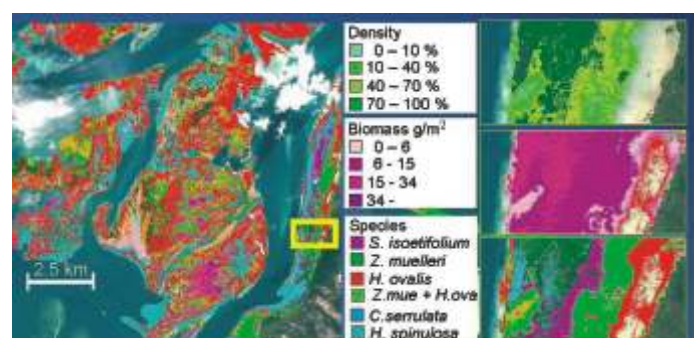


Figure 2. Seagrass species map for the Eastern Banks, 29 July 2004, produced from high spatial resolution Quickbird satellite image data. Inset maps show a zoomed in area and output maps of species, biomass and density.

The Gladstone Oil Spill

Just before midnight on 24th January 2006, the tug "Tom Tough" suffered an engine failure and punctured the hull of a 263 metre Korean vessel, 'Global Peace', causing approximately 25-30,000 litres of heavy fuel oil to spill out into Gladstone Harbour. This was arguably the largest oil spill in the Great Barrier Reef World Heritage Area for 30 years.



Although there were some concerns that strong winds and strong currents could push the oil spill into the Great Barrier Reef, the spill was contained to the waters off Fisherman's Island and the estuaries of Calliope River and Auckland Creek. The multi-agency response included booms and boats; foreshore assessments; a QPWS wildlife response; clean-up of mangroves, marinas and other foreshore areas; liaison with an affected community; and interesting legal ramifications. Although clean-up crews initially suffered a setback with the high winds and the collapse of a protective boom (which allowed oil to enter the marina, damaging boats and affecting seven birds), the majority of the slick was removed within a few days.



Above left: the main slick on the second morning
Above right: Floating booms being used to help contain the oil spill in Gladstone

The Marine Ecology Group at DPI&F was recently in Gladstone (27th Feb-1st March) to reassess the status of intertidal seagrasses that may have been affected by the oil spill. These meadows had last been looked at in October 2005 as part of the regular monitoring program and initial results of the February survey indicate that they had been largely unaffected by the oil spill. Tidal conditions at the time of the spill may have spared the intertidal banks from prolonged exposure to the oil. The team is planning to resurvey the area later in the year.

Samples of water, fish, prawns and crabs have also been laboratory tested, and the DPI&F recently advised fishermen that local product to date is suitable for sale. DPI&F officers will continue their sampling program for some time, particularly mud crab and fin fish from the area directly affected by the oil spill.



A dark oil stain marks the height of the tide on the effected mangroves in Gladstone

A plan for an ongoing Port Curtis integrated habitats monitoring program, including seagrass, is currently under consideration. If implemented, the long-term monitoring program will assess the slick's impact on the ocean's bottom. ♡

Website update

The Seagrass-Watch website has continued to prove popular with web users, as the number of visitors accessing the site has continued to increase to near 1000 per month.

The website has also had a major overhaul in the past few months. With the assistance of Sen Chung (Momidea), the website now features an interactive map which allows users to quickly access information on currently participating locations, regions and countries. The streamlining of the website will also allow faster downloading and quicker updates. New features include a gallery page.



In late January 2006, the Seagrass-Watch website was selected for preservation by the State Library of Queensland. A copy of the Seagrass-Watch website was archived for historical and preservation purposes in PANDORA (Preserving and Accessing Networked Documentary Resources of Australia) Australia's web archive by the National Library of Australia and Partners. ♡

Seagrass-Watch HQ welcomes Dr Hugh Kirkman

Dr Hugh Kirkman is a marine ecologist with more than 27 years of marine research experience in Australia and internationally. His experience includes seagrass ecology and biology, macroalgal ecology, marine resource management, policy and strategy development for marine systems and mapping underwater features. He has worked in east Asia for 5 years and has knowledge and experience of marine resources in eight east Asian countries.

Hugh has also published extensively and has more than 5,000 hours underwater SCUBA experience. Hugh's interests lie in management of marine resources and building long-term databases suitable for assisting management with sustaining those resources. The establishment of marine protected areas is a priority in his work with mapping underwater habitats. He is also a professional editor working part-time to edit journal papers for authors with English as a second language.

Hugh's extensive experience in southern Australia will play a key role in providing scientific expertise to Seagrass-Watch participants assessing temperate seagrass ecosystems. ♡

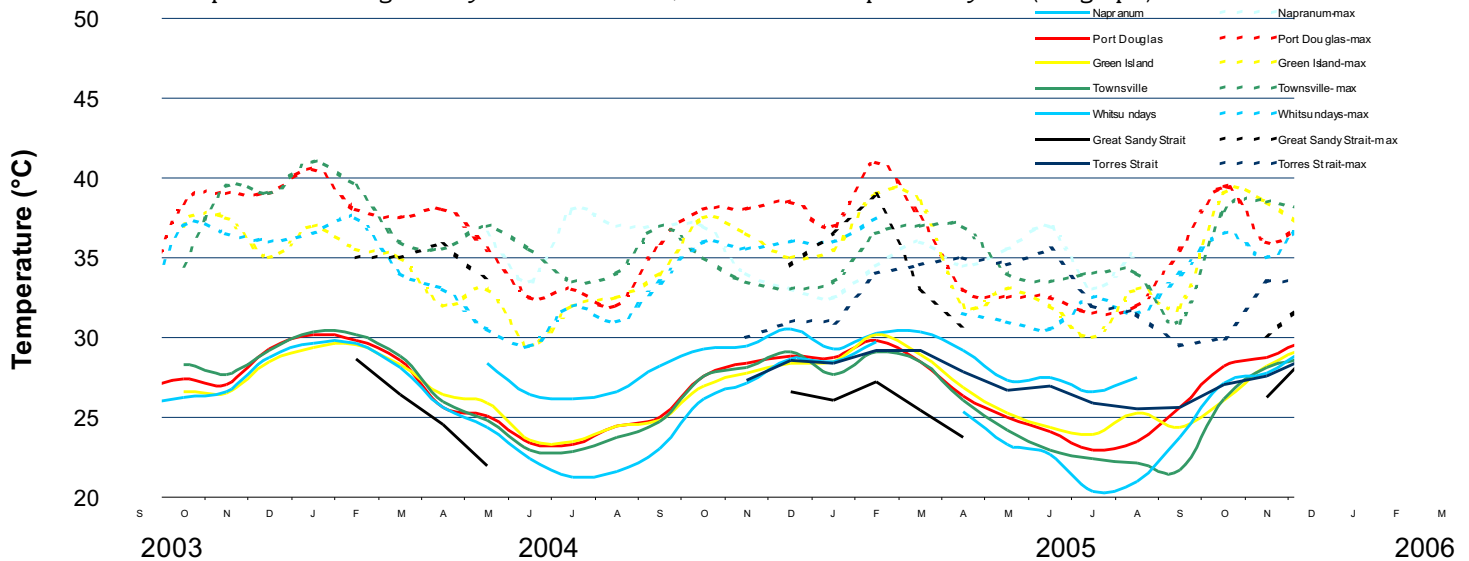


Hugh Kirkman (right) and a park ranger collect seagrass at Haad Chao Mai National Park, Thailand.

Temperature monitoring

In late January 2006, coral bleaching was observed by marine researchers and tourist operators on reefs in the Capricorn section of the Great Barrier Reef (Keppels) and sea surface temperatures (SSTs) in the region were well above critical levels for normal coral function. SSTs in the Keppels had been hovering 2 degrees C above the average since early December, and this sustained warm period caused temperature-sensitive corals to reach bleaching thresholds.

Intertidal seagrasses in the region near Gladstone also declined between November 2005 and February 2006. A long term seagrass monitoring program conducted by DPI&F and Central Queensland Ports Authority indicated that there was a large decline in biomass of intertidal *Zostera capricorni* meadows throughout the port area and at nearby Rodds Bay. Although water temperature was not measured as part of the program, the widespread nature of the seagrass decline indicated that the cause of declines was likely to be associated with climate conditions such as temperature. Seagrass-Watch *in situ* temperature monitoring however, has indicated that temperatures were generally lower over the 05/06 summer than previous years (see graph).



Although the Keppel reefs experienced near 100% bleaching episodes in 1998 and 2002, they recovered within 3-6 months revealing a remarkable resilience not seen in many other places on the Great Barrier Reef. Research in the Keppel Islands by scientist's from the Australian Institute of Marine Science have found that corals in this region have the ability to change the type of algae they associate with and that this alters their thermal tolerance. Corals in the Keppels also seem to grow faster than their northern counterparts and store more fats. They believe this may be at least part of the reason why the Keppels are able to bounce back from a heat wave that had dire consequences for other regions. AIMS Scientists are hopeful of a similar recovery following this bout of bleaching and will audit the situation in the near future, as well as conduct more experiments. ♡

BleachWatch

BleachWatch is a community-based coral reef monitoring initiative developed by the Great Barrier Reef Marine Park Authority (GBRMPA). BleachWatch was established in 2002 during a mass-bleaching event. In subsequent years, both the number of participants and its spatial coverage have expanded. BleachWatch is a key component of the GBRMPA's Coral Bleaching Response Plan, a comprehensive management response to mass coral bleaching.



When water temperatures increase above average, severe and widespread bleaching can occur. The initial onset of mass coral bleaching can range from gradual and patchy to rapid and uniform, and can occur with varying synchrony over hundreds or thousands of square kilometres. Detecting the early signs of a mass-bleaching event requires a wide network of observers providing regular reports of conditions throughout the region.

BleachWatch is built on a network of regular reef users (including tourism professionals, researchers and fishers) who voluntarily monitor and report on conditions at reefs that they visit regularly. BleachWatch is an opportunity for everyone to help the GBRMPA understand the effects of coral bleaching, and the implications of climate change on the Great Barrier Reef.

The goals of BleachWatch are:

- To inform the community about coral bleaching and to encourage individuals, tourism operators, organisations and fishers to participate in BleachWatch.
- To detect the early stages of coral bleaching events over a wide geographic range.
- To use coral bleaching as a means to communicate the broader impacts of climate change on the Great Barrier Reef.

For information on how to participate in BleachWatch, please email bleachwatch@gbrmpa.gov.au or contact the BleachWatch Coordinator on (07) 4750 0700. ♡



Bleaching reported by Maren Mathew near her Seagrass-Watch monitoring site at Hydeaway Bay, early 2002.



Facts about Echinoderms

Echinoderms are radially symmetrical animals that are only found in the sea (*there are none on land or in fresh water*). Echinoderm means "spiny skin" in Greek. Many, but not all, echinoderms have spiny skin. There are over 6,000 species. Echinoderms usually have five appendages (*arms or rays*), but there are some exceptions

Radial symmetry means that the body is a hub, like a bicycle wheel, and tentacles are spokes coming out of it (*think of a starfish*). As larvae, echinoderms are bilaterally symmetrical. As they mature, they become radially symmetrical.

Most adult echinoderms live on the bottom of the ocean floor. Many echinoderms have suckers on the ends of their feet that are used to capture and hold prey, and to hold onto rocks in a swift current.

Sea stars



Sea stars (group name Stelleroidea) are sometimes called starfish, though they are not real fish (they lack both vertebrae and fins). There are two sub-types of sea stars:

- Asteroideas are the true sea stars and sun stars.
- Ophiuroideas are brittle stars and basket stars.

The differences between the two sub-types lies in how the arms connect to the central disk. Ophiuroids have arms that do not connect with each other. There is a distinct boundary between arm and central disk. Asteroids have arms that are connected to each other. Also, it is harder to tell with asteroids where the central disk ends and the arms begin.

The sea star's top surface (or skin) looks spiny if you examine it. If you look very closely you will notice that there are different types of growths on the surface. Some bumps are used to absorb oxygen, they are called dermal branchiae. Pedicellariae are pincher-like organs used to clean the surface of the skin. Barnacle larvae could land on a sea star and start growing if it were not for these organs.

Sea Urchins & Sand Dollars



Sea urchins, heart urchins, cake urchins, and sand dollars belong to a sub-group of echinoderms called Enchinoidea. These creatures have many sharp spines pointing out in all directions that offer protection from predators.

The spines are connected to the skeleton in a ball-joint manner called the "test." Spines are able to swivel towards a predator because they are connected to muscles.

These animals have five paired rows of tube feet with suckers. The mouth is on the bottom, and the anus on top. The mouth contains five teeth that point towards the center. The tubed feet are used to move along the bottom of the sea, where these organisms use their teeth to eat algae.



Sea Cucumbers

Sea cucumbers belong to a sub-category of echinoderms called Holothuroidea. Some members of the group look like cucumbers you find in the supermarket. The similarity ends there.

Sea cucumbers are football shaped creatures that lay on their side at the bottom of the ocean. They have five rows of tube feet running lengthwise. Its mouth is surrounded by tentacles that are really tubed feet. Unlike sea stars, the vascular system is not filled with sea water. Instead, sea cucumbers use a special body fluid.

Sea cucumbers eat plankton and other organic matter. Some position themselves in a current that brings a steady supply of food, and spend hours there. The tentacles open up and collect food in the current. The sea cucumber brings each tentacle to its mouth to eat, while the other tentacles go on collecting food. Other sea cucumbers feed by sifting through sand using their tentacles.

How Do Sea Cucumbers Protect Themselves?

Many sea cucumbers are poisonous. If injured, sea cucumbers can kill fish in the same aquarium as them.

The sea cucumber has an interesting way of defending itself - a sea cucumber can expel (throw out) all of its internal organs! This either scares off or satisfies predators. The sea cucumber can then grow another set of internal organs.

Some sea cucumbers secrete a very sticky substance as a defence mechanism. If you get this glue on your body, you will not be able to remove it without shaving your skin!



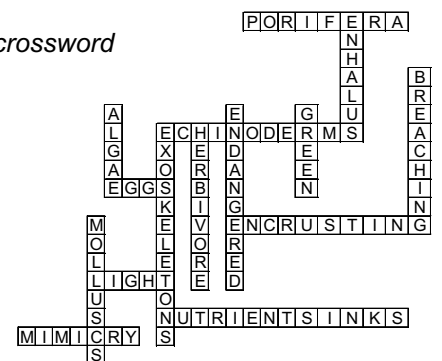
Envirofund

Round 8 of the Envirofund is at present open. Applications close at 5pm on Fri 28th April.

Funding is available for up to \$50 000 for community groups in Australia. To download a copy of the form, guidelines and hints go to www.nht.gov.au/envirofund or alternatively FREECALL 1800 065 823 for a printed copy.

General enquiries FREECALL 1800 303 863

Solution to Issue 24 crossword



Do you want to get involved?
Contact a local Seagrass-Watch representative in your location - visit www.seagrasswatch.org



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Any comments or suggestions about Seagrass-Watch or contributions to newsletters would be greatly appreciated.

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