AusCPR Survey Newsletter

An update from the Australian Continuous Plankton (AusCPR) Recorder Survey

Australian Continuous Plankton Recorder Survey (AusCPR)

The Australian Continuous Plankton Recorder (AusCPR) survey measures plankton communities as a guide to the health of Australia's oceans. It is part of the Ships of Opportunity (SOOP) Facility in Australia's Integrated Marine Observing System (IMOS) and is jointly operated by CSIRO Marine and Atmospheric Research (CMAR) and the Australian Antarctic Division (AAD). The aims of the survey are to:

- *map phytoplankton and zooplankton biodiversity and distribution*
- *develop the first long-term zooplankton baseline for Australian waters*
- *document plankton changes in response to climate change*
- *provide indices for fisheries management*
- *detect harmful algal blooms*
- *validate satellite remote sensing*
- *initialise and test ecosystem models*

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A note from the AusCPR project directors…

Anthony J. Richardson (CSIRO/UQ) & Graham Hosie (AAD)

Thanks for taking the time to browse through our third newsletter. The motivation for this 6-monthly newsletter is to give people more information about what the AusCPR survey is, what we do, and what we have found. We would like to thank Anita Slotwinski for putting this newsletter together once again.

This is a good opportunity to congratulate Graham Hosie for being elected as Chair of the Global Alliance for CPR Surveys (GACS) in the inaugural workshop in Plymouth on 20-21 Sep 2011. This is a great opportunity for AusCPR to develop stronger collaborative links with CPR surveys globally. GACS will ensure that the CPR surveys expand into new regions of the oceans and that our products are standardised wherever possible. You can read more about GACS in Graham's article on page 4.

In terms of staff movements, Claire Davies has recently had a 3-month "sabbatical" on Christmas Island running a dive shop and Mark Tonks increased his time to cover for Claire. Welcome back Claire and thanks for your extra help Mark. Anthony Richardson recently travelled overseas for 2 months, attending workshops and meetings on climate change impacts globally and networking with other CPR surveys. During his visit to South Africa, he had many fruitful discussions with Hans Verheye and Marco Worship about their new CPR survey from Angola to South Africa. AusCPR has pledged to work closely with the Southern African survey wherever possible. It was good to catch up with fellow "plankton enthusiasts" Jenny Huggett, Mark Gibbons and Larry Hutchings whilst there.

In South Africa, Anthony gave a talk on how ocean observing systems such as AusCPR can be used to measure Essential Ocean Variables that can inform ecosystem based management. Increasingly we will be asked to provide regular assessments, annual status reports, and metrics and indicators of change to support ecosystem management. This will be a focus area for AusCPR over the next couple of years with GACS producing integrated global products and Wayne Rochester (CSIRO) collaborating with AusCPR to develop key metrics and indicators.

In terms of new routes, in coming months we will be performing our first tows on the Great Barrier Reef. The AIMS vessel the RV Cape Ferguson will tow the CPR twice a year within the GBR lagoon and cover most of length of the reef. There is also the potential for us to tow behind the AIMS vessel the RV Solander on the NW Shelf. Thanks to our AIMS supporters Peter Doherty and Craig Steinberg for working with us to make this happen.

Australian Government
Department of Innovation, Industry, Science and Research

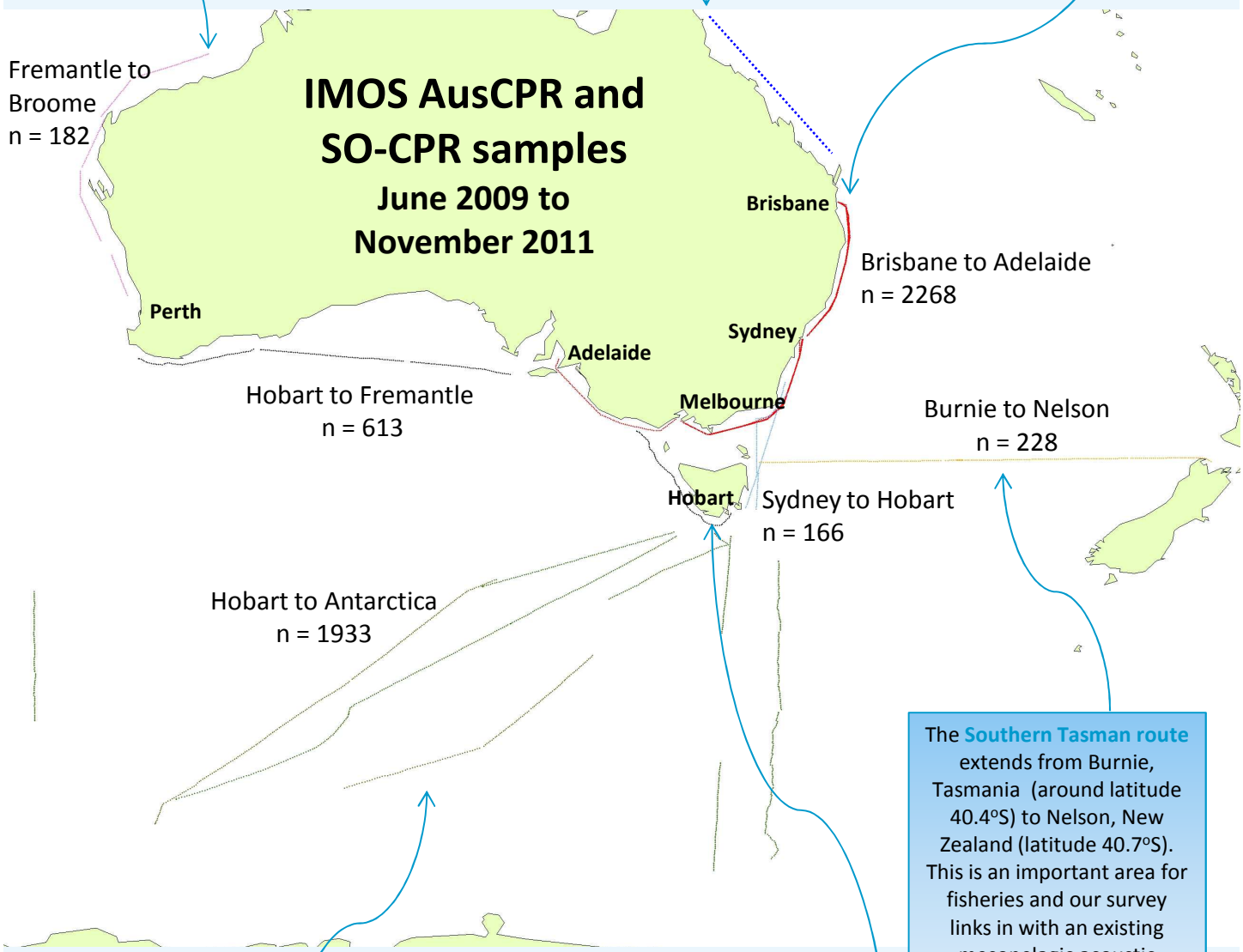
CSIRO

Australian Government
Department of Sustainability, Environment, Water, Population and Communities
Australian Antarctic Division

The new **WA route** is likely to run between latitude 12.3°S to latitude 21.8°S down the Leeuwin Current . The north-west region has potential for strong development of industries such as gas and mining. We will be working in collaboration with the Australian Institute of Marine Science (AIMS).

The **GBR route** will extend from approximately latitude 14.3°S to latitude 23.4°S. The Great Barrier Reef is an area likely to be strongly affected by warming and ocean acidification. We will be working in collaboration with the Australian Institute of Marine Science (AIMS).

The **EAC route** extends from Brisbane (Queensland, latitude 27°S) to Adelaide (South Australia, latitude 34°S) down the east coast of Australia and follows the southward-flowing warm-water East Australia Current. This region is forecast to warm more than anywhere else in the Southern Hemisphere this century.



The **Southern Tasman route** extends from Burnie, Tasmania (around latitude 40.4°S) to Nelson, New Zealand (latitude 40.7°S). This is an important area for fisheries and our survey links in with an existing mesopelagic acoustic survey.

A typical AusCPR **Southern Ocean route** extends from just south of Hobart (Tasmania, latitude 44°S) to the edge of the Antarctic sea-ice (latitude ~62°S). Cumulatively, these routes cover the region south of Australia between longitude, 60°E and longitude, 160°E. Together with the EAC route, the Southern Ocean sampling allows a almost continuous transect running between the warm tropical waters of QLD and the cold polar waters of the Antarctic.

The **TAS route** extends down the east coast of Tasmania, which is also subjected to the influence of the EAC. There is already some evidence of warm-water species moving southward.

Plankton data update

Plankton data are available free of charge at http://imos.aodn.org.au/webportal/.
Visit http://imos.org.au/emii.html for information on data use.

Route	Start	Ship	Freq	Dist (nm)	Tows	# PCI Samples	# Phyto samples	# Zoo Samples	Total phyto taxa	Total zoo taxa
Brisbane – Sydney	Jun 2009	ANL *Windarra*	2 monthly	4368	10	717	182	182	95	346
Sydney – Melbourne	Jun 2009	ANL *Windarra*	2 monthly	5040	10	809	206	206	72	321
Melbourne – Adelaide	Sep 2010	ANL *Windarra*	2 monthly	1971	2	172	58	43	37	147
Sydney – Hobart	Sep 2010	*Southern Surveyor*	ad hoc	409	1	82	20	20	19	121
Burnie – Nelson	Aug 2010	FV *Rehua*	annual	1143	1	228	57	57	30	101
Fremantle – Broome	April 2010	*Southern Surveyor*	quarterly	698	1	182	21	3	64	80
Australia – Antarctica*	Nov 2008	RSV *Aurora Australis*	spring to autumn	10913	15	1933	1801	1933	89	175

** This is a part of 30,000 data records (150,000 nmiles) for 240 zooplankton and 83 protistan taxa available from the SO-CPR survey that has been operating for the past 20 years.*

Above left: The ANL Windarra (Image: Les Blair www.marinetraffic.com). Above right: The RSV Aurora Australis (Image: AAD). Bottom left: The FV Rehua (Image www.action-engineering.co.nz). Bottom right: The RV Southern Surveyor (Image: Edwina Hollander, CSIRO www.scienceimage.csiro.au).

Going Global

Graham Hosie

In September 2011, the heads of the nine regional CPR Surveys met to discuss the formation of a global CPR programme. The IMOS AusCPR survey was represented by Co-Director Dr Anthony J. Richardson. Dr Graham Hosie represented the SCAR Southern Ocean CPR Survey as head of that survey, and is also Co-Director of AusCPR.

The plan for going global was a vision that Prof. Peter Burkill presented to the Sir Alister Hardy Foundation for Ocean Science when he became Director of SAHFOS. It was a vision shared by the regional surveys as well, who enthusiastically agreed to form the Global Alliance of CPR Surveys (GACS). The general aim of GACS is to understand changes in plankton biodiversity at ocean basin scales through a global alliance of CPR surveys. Specific aims include:

- development of a global CPR database,
- production of a regular ecological status report for global plankton biodiversity, and
- provide an interface for plankton biodiversity with other global ocean observation programmes.

Working together, pooling our data and resources, was considered essential in order to understand the effects of environmental changes on plankton biodiversity at a global level. It would also allow us to assess changes and events at a local or regional level in a global context. The heart of GACS is the development of the global database of CPR data that will allow us to make such assessments of local, regional and global changes.

A board of governance was established, comprising the regional heads of CPR Surveys, with Graham Hosie as the first Chair and Dr Sonia Batten (North Pacific CPR) as Co-Chair. Working groups are being developed and will address the formation of the global CPR database, and maintaining standards and methodologies.

More news will follow in the next issue of the AusCPR newsletter.

Left: Zooplankton images taken at the Brisbane lab,
top left: comb jellies
top right: juvenile decapod
bottom: arrow worm (Images by Anita Slotwinski)

Update from the Brisbane, Queensland Team

Frank Coman

The laboratory has been busy with two of Anthony's students, Sarah Pausina and Lydie Courtier both spending some time at the microscope sorting through zooplankton samples as part of their PhD studies, and Julian Uribe assisting Felipe Gusmao by sorting samples collected for an ARC Linkage project in Moreton Bay, Queensland. Claire and Anita attended zooplankton training in South Africa, and a full report is presented on page 7, while Frank attended the annual AMSA conference in Fremantle to present the latest from AusCPR. We have, however, been without Claire for the last 3 months as she has taken a period of leave without pay to help out a friend on Christmas Island.

Since the last newsletter the team at the Queensland laboratory have also prepared cassettes for 3 EAC CPR deployments between Brisbane and Adelaide, in May, July and October. We were also able to collect samples from the Southern Surveyor between Brisbane and Auckland in May. Unfortunately a planned deployment between Burnie and Nelson in New Zealand could not be completed, despite all the gear being on the vessel, as the fisheries permit did not come through in time.

Sampling at the National Reference station at North Stradbroke Island has continued each month. Mark Tonks is in the process of completing his coxswain's certification, which will increase the likelihood of always completing the regular NRS sampling, as we will then have two qualified coxswains in our team at Brisbane. When the weather allows we have been collecting an extra zooplankton sample, which is kept live in a 20 L container on the boat and is brought back to the laboratory for Anita to use for photography. Much better images are obtained with live zooplankton, which retain much more pigmentation than when preserved. We are also starting to collect extra data for collaborators at the national reference station. This includes a turbulence profile with Charles Lemckert and Jurgen Baly Zier from the School of Engineering at Griffith University, and microbial molecular samples for Dr Mark Brown from the School of Biotechnology and Biomolecular Science at the University of New South Wales and Lev Bodrossy from CSIRO.

The ability of the laboratory to capture images has recently been improved with the purchase of new imaging systems for both the dissecting and compound microscopes. The system was purchased through the CAPEX funding and consists of Canon Mark II SLR cameras, software and adaptors to suit the Leica microscopes. Fine images have been captured with the new system (see images opposite).

A zooscan system has been ordered for the laboratory, and will be used to provide normalised biomass size spectra and simple taxonomic classification (to order). This will be used for National Reference Station samples around Australia. Most recently we have been successful in the latest round of CAPEX bids and the laboratory will be getting one more Leica M165 dissecting microscope.

Update from the Hobart, Tasmania Team

Dave McLeod

Preparations for the upcoming Antarctic shipping season are almost complete with the CPR expected to cover over 10, 000 nautical miles during the austral summer (October – April). 23 tows are planned from 5 voyages aboard the RSV *Aurora Australis,* with the first voyage of the season due to depart Hobart on the 21/10 bound for Davis Station, Antarctica. Counting of samples from the previous seasons sampling (2010/11) is well underway with many samples from just south of Tasmania being added to the database. We are currently aiming to increase samples collected in this region between Tasmania and the sub-Tropical front, to create virtually a continuous transect running between Brisbane and Antarctica, thus, covering tropical waters to polar waters and everything in between.

Plankton 2011 and SO-CPR Workshop

In September, Anthony J. Richardson, Graham Hosie and myself all attended the Plankton 2011 Symposium in Plymouth, UK organised by the Sir Alister Hardy Foundation for Ocean Science (SAHFOS). The two-day symposium was celebrating 80 years of the CPR Survey started by Sir Alister Hardy in 1931 and coincided with a number of other meetings and events planned for the week. Monday was taken up with a Southern Ocean CPR Workshop with the majority of the SO-CPR Survey team members present. We generally focussed on phytoplankton procedures, but also discussed issues following on from the week-long SO-CPR Standards Workshop held in Tokyo last year. The one day workshop was extremely useful for all involved and such discussions continue to ensure consistency of protocols among multiple laboratories involved in collecting and counting CPR samples in the Southern Ocean.

The Plankton 2011 symposium - Plankton Biodiversity and Global Change – had 175 delegates from 21 countries. There were 29 talks given and well over 30 posters from a wide-range of topics, but all focussed on plankton with a theme of long-term change. Graham gave an invited talk on *Changes in Antarctic plankton and krill: Consequences for the future* and we also presented two posters, one summarising the AusCPR project and results so far, as well as a poster on the recent *Noctiluca scintillans* finding in the Southern Ocean (it has never been found here before and is likely to be a range shift associated with global warming (more in the next issue). A session of note was titled *Large-Scale Changes in Ocean Phytoplankton* and this involved three speakers with differing views on global trends in phytoplankton abundance. Boris Worm (decline), Marcel Wernand (mixed) and Abigail McQuatters-Gollop (increase) gave their presentations and then participated in an open-panel discussion in which the audience was invited to ask questions of the speakers. It was very interesting to see vigorous scientific debate on a topic of such global importance. The symposium was a fitting celebration for the 80th anniversary of the CPR Survey and it was very beneficial to have AusCPR well represented.

Right: Plankton 2011 featured plankton and CPR inspired art works including 'Diverse Catch' by artist Sam White.

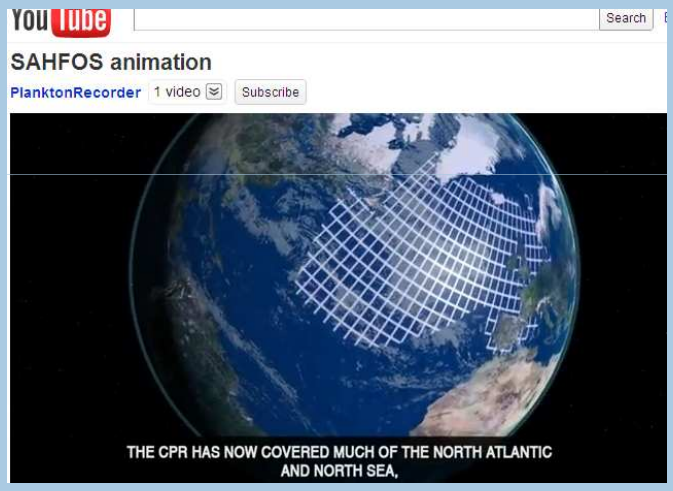
Previous page: Images from the various sessions at Plankton 2011.

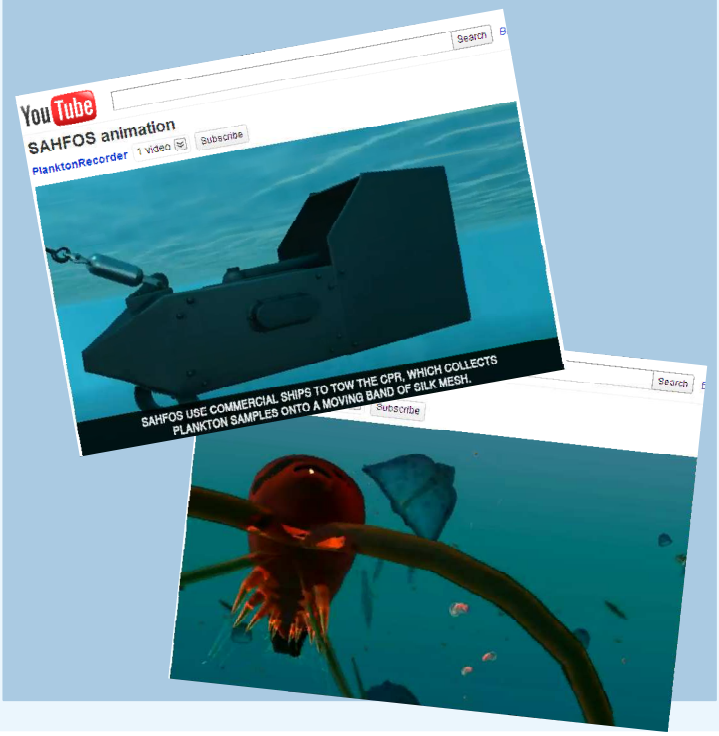
Images by Rob Camp.

CPR Animation

Our sister CPR survey run by the Sir Alister Hardy Foundation of Ocean Science has recently uploaded an animation describing the importance of plankton and the Continuous Plankton Recorder Survey. Follow the link below and immerse yourself in the world of plankton for a few moments…

http://www.youtube.com/watch?v=neNqDmXEBy4





South African students and scientists develop copepod identification skills: AusCPR runs workshop in Cape Town

Thanks to a CSIRO Early Career Development Grant, two researchers from the Australian Continuous Plankton Recorder Survey (AusCPR) travelled to South Africa and spent two weeks at the University of the Western Cape. Anita Slotwinski and Claire Davies participated in an information exchange and spent a week receiving expert training from Prof. Mark Gibbons in identifying important zooplankton taxa including cnidarians, pteropods, salps, doliolids, chaetognaths and appendicularians. These groups are especially important as food for fish, influencing fish recruitment (e.g. predation by jellyfish and chaetognaths), key players in carbon cycling (e.g. sinking of salp feacal pellets, appendicularian houses) and indicators of ocean acidification (e.g. pteropods). These groups are well represented in plankton samples from AusCPR and the National Reference Stations and were previously only identified very broadly, due to the lack of knowledge in Australia. The added dimension of learning to identify these taxa to species level will increase the value of our plankton datasets.

Anita and Claire also ran a week-long workshop on copepod identification. There were 10 workshop participants, a mixture of university PhD students and researchers from around South Africa. Below is an article written by Riann Cedras PhD Candidate from the University of the Western Cape who was one of the workshop participants. Anita and Claire benefited enormously from the opportunity to teach others - there is no better way to learn a subject area than to have to teach it. It is also commendable that IMOS trained staff have passed on valuable taxonomic skills to many young indigenous scientists in Southern Africa.

Below, workshop participants from left: Claire Davies, Riaan Cedras, Michelle Pretorius, Levian Ferreira (seated), Kholeka Batyi, Anita Slotwinski, Samantha Ockhuis and Susan Jones.

Workshop report by Cape Town student Riaan Cedras

Copepods are crustaceans (like crabs and prawns) and those that swim freely in the open ocean (members of the plankton) are arguably the most multitudinous metazoans on the planet, being found in all oceans and seas, at all depths. They are diverse – there are about 1800 species each with its own operational optima, and they are small – nay minute (generally less than 1 mm in length). Because of these features and the fact that they cannot out-swim a ship they are easily sampled using nets (etc), and this makes them ideal for monitoring the state of the marine environment.

In order to be able to use copepods in any sort of monitoring (or other) work, however, you need to know what you are looking at in a net caught sample of plankton. Now that may sound simple, but given how many different species there are, given that males look different from females and that a copepod goes through almost 10 moult stages before it reaches adulthood (each stage of which looks slightly different from the one before and the one after), it is anything but easy! In South Africa, only scientists working with the Department of Environmental Affairs have any knowledge of copepod identity, and that knowledge is largely restricted to the common species that are caught from the Atlantic Ocean along the west coast, as these are the beasts that fuel the food chains leading to hake and sardine….not to mention seabirds, whales and seals. Our knowledge of the copepods living in the SW Indian Ocean along the East and South coasts of South Africa is almost non-existent, which effectively means we cannot use copepods as barometers of environmental change (etc).

That has all changed, however, thanks to a four-day workshop hosted by the University of the Western Cape in early June 2011 in the New Life Science building. Two experts visited South Africa from Australia specifically to help regional students and scientists learn how to identify copepods for themselves. The two in question were Claire Davies and Anita Slotwinski, who work for CSIRO in Brisbane where they form core-members of the AusCPR team. There, they are responsible for identifying copepods to species level from routine samples…

…that are collected from around the Australian coastline. They therefore have an extensive knowledge of tropical, subtropical, warm temperate and cold temperate copepods – an array of habitats far in excess of anything we find locally. Importantly, from a training point of view, they are para-taxonomists, and not strict taxonomists. The differences between these two words may seem small to most but they are key. A taxonomist is someone who will spend hours and hours looking at every feature of a specimen before deciding that it is species X, focusing especially on all the critical features. It takes a taxonomist several days to look through a plankton sample. A para-taxonomist, on the other hand, will take much less time to process a sample, in part because she/he uses non-critical but geographically unique features (e.g. size, shape, spots etc) to supplement the use of some (not all) of the critical features. Inevitably, there are errors in the para-taxonomic method, but it is quick and if consistently applied it is extremely useful in generating biodiversity information. Most para-taxonomists are self-taught, though most have extensive contact with and some training from classically trained taxonomists, and this do-it-yourself approach is essential when it comes to training.

The trainees in this instance were some eight students and scientists from the region, most of whom had limited experience of working at the resolution of copepods in unfamiliar samples. "Classes" contained a minimum of theory and were of the practical, do-it-yourself types, and were initially based on material that Claire and Anita had brought with them from Down Under. As the trainees developed their knowledge and their confidence in being able to identify species using a suite of different tools, so they had an opportunity to work with their own material from the Indian Ocean. This sometimes made the two tutors very excited, as they got to see a number of things for the first time. The training sessions were made so much easier by the fact that high and low-power microscopes were connected to a computer, which projected high resolution images on plasma screens. And, Claire and Anita had spent a lot of time putting a comprehensive set of references and keys together that the students could use to make their lives simpler.

All in all, the workshop could be considered a success. The participants learnt some new techniques to help them with their work, they made some new contacts for the future and they got to appreciate that their efforts could be made so much easier by discussing problems with their colleagues. The trainers also got a chance to make some new contacts, to see some new goggas and to test-drive their courseware, in addition to sampling the delights of the SW Cape.

Update from the Perth, Western Australia Team

James McLaughlin and Joanna Strzelecki

This year's annual Australian Marine Science Conference took place in Fremantle, Western Australia. The conference theme was Crossing Boundaries, reflecting the need for bridging information across scales, environments and disciplines. Plankton - the foundation of marine food webs - was one of the 17 symposia included at the conference. It was organised by Graham Hosie and Frank Coman and presentations included spatial and temporal dynamics of plankton across biogeographic zones, use of genetics, and plankton physiology. Graham Hosie started the symposium by presenting new modelling methods using Boosted Regression Trees and Generalised Dissimilarity Modelling to predict distributions patterns of individual species or whole plankton assemblages. It allowed predictions to be made in poorly sampled areas by using satellite data and the modelled environmental/plankton relationships. Frank Coman provided and overview of the Australian Continuous Plankton Recorder (AusCPR) programme. Joanna Strzelecki compared zooplankton communities between east and west coast of Australia and estimated the impact of climate change on zooplankton from both regions. Alicia Sutton's talk on horizontal and vertical distribution of euphausiids associated with a meso-scale eddy of the Leeuwin Current won Peter Holloway Physical Oceanography Award. She found a diverse assemblage of euphausiids comprising 22 species associated with the warm core eddy. Ben Harris presented data on euphausiids from the East Australian Current. Contrary to other studies, he found higher densities of euphausiids during the day at shallower depths. Joanna Browne used DNA sequencing to study parasites of jellyfish. Penelope Ajani presented spatial and temporal patterns of phytoplankton along the New South Wales coast and climate change induced changes to these patterns, including frequency of blooms, presence of tropical species, timing of onset of spring blooms and presence of toxic species. Christel Hassler measured iron bioavailability to phytoplankton in the Tasman Sea and Marie Sinoir investigated the requirements for zinc in temperate oceanic phytoplankton. Abstract of these talks are available on Australian Marine Association website (https://www.amsa.asn.au/) .

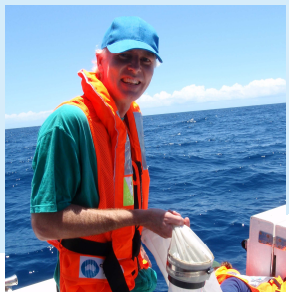
WA phytoplankton counts from the CPR towed from Fremantle (32°07'S, 115°47'E) to Broome (18° 0'S, 122° 15' E) last year so far have yielded a dominance in counts by Hyalochaete Chaetoceros species. Other taxa counted to date include several genera of Diatoms including *Bacteriastrum, Phaeoceros – Chaetoceros, Thalassionema, Pseudonitzchia, Rhizoselenia, Nitzschia, Thalassiothrix, Hemiaules,* and *Climacodium*. Along with diatoms some other representative protist genera including Ceratium, Podolampas (see attached photo), and other small naked and armoured dinoflagellates, Foraminiferans, Radiolarians, Coccoliths, Silicoflagellates, Tintinnids and Cilates have been identified in lesser quantities.

Left: *Thalassionema* from the Fremantle to Broome tow.
Image: James McLaughlin

The Team

Anthony Richardson
Position: Joint Leader AusCPR
Location: CSIRO, Brisbane, Queensland
I co-manage the AusCPR project, I help secure funding, guide research directions, develop relationships with other plankton surveys, and support and develop AusCPR staff. My research interests are marine climate change ecology, plankton ecology, pelagic ecosystem dynamics, and ecosystem modelling. In my spare time I love to spend time with my family.

Graham Hosie
Position: Joint Leader AusCPR
Location: AAD, Hobart, Tasmania
I co-lead AusCPR and lead the SCAR Southern Ocean CPR (SO-CPR survey). I set research directions, manage resources, develop relationships with other surveys and provide training and instruction. My research interests are community ecology of Southern Ocean plankton, krill ecology, Antarctic marine ecosystem dynamics, impacts of global change on marine biodiversity, biogeography, and building international research collaborations.



Frank Coman
Position: Deputy Leader AusCPR
Location: CSIRO, Brisbane, Queensland
My role involves liaising with ships that tow the CPR, the management of the North Stradbroke Island NRS sampling, zooplankton sorting of IMOS NRS samples, and plankton analysis of AusCPR samples. I am interested in plankton biology and ecology, climate change impacts on marine ecosystems and aquaculture. In my spare time I play sport, enjoy fishing, camping and photographing Australian wildlife.

Claire Davies
Position: Plankton Biologist
Location: CSIRO, Brisbane, Queensland
My job includes identifying and counting zooplankton samples from the NRS, and counting phytoplankton and zooplankton for AusCPR samples. I also manage the NRS and AusCPR databases, and am a boat driver for SE NRS sampling. My research interests include plankton ecology, climate change impacts and the feeding dynamics between zooplankton and megafauna. In my spare time I spend as much time in and out of the water as possible.

Anita Slotwinski
Position: Plankton Biologist
Location: CSIRO, Brisbane, Queensland
I analyse zooplankton samples from the NRS network and phyto- and zooplankton samples from AusCPR. I also manage the project website, communication materials, and the zooplankton species reference collection. My research interests are in marine plankton ecology, environmental change and species response, plankton taxonomy, photomicroscopy, and development of taxonomic guides for zooplankton. In my spare time I like to spend time with family and friends, cook, read and experiment with photography, art and design.

Mark Tonks
Position: Plankton Biologist
Location: CSIRO, Brisbane, Queensland
My tasks include counting zooplankton from the NRS network, phyto- and zooplankton identification of AusCPR samples, and management of project procedure manuals. I have worked for CSIRO for 19 years and spend 60% of my time working on plankton. My research interests include plankton ecology, bycatch sustainability and fish and crustacean ecology. I also enjoy playing a variety of sports including hockey, touch football and cricket.

Dave McLeod
Position: Plankton Biologist (CSIRO)
Location: AAD, Hobart, Tasmania
I analyse Southern Ocean CPR samples for both phytoplankton and zooplankton, contribute to publications, and help with various operational AusCPR project tasks. My research interests include plankton as indicators of ecosystem change and impacts of Southern ocean zooplankton populations on higher trophic levels. In my spare time I like to get outside and go fishing and camping, play and watch sport, and have BBQs with friends.

Joanna Strzelecki
Position: Marine Biologist
Location CSIRO, Floreat, Western Australia
I am helping to expand the AusCPR survey into WA waters and will be responsible for the analyses of phyto- and zooplankton samples and various operational tasks. I have been with CSIRO for 8 years and work 30% of my time with AusCPR. My research interests include plankton ecology, food web dynamics, benthic-pelagic coupling, and the settlement and recruitment of marine invertebrate larvae. In my spare time I love to travel.

James McLaughlin
Position: Marine Biologist/ Biogeochemist
Location: CSIRO, Floreat, Western Australia
My job is helping to expand the survey into WA waters and the analysis of phyto- and zooplankton samples. I have been with CSIRO for 5 years and work 10% of my time with AusCPR. My research interests include marine phytoplankton dynamics and ecology, benthic and pelagic primary production, and ocean acidification. I enjoy spending time with my family, travelling and keeping tropical aquarium fish.

In other plankton related news…
Project Manta

Lydie Couturier and Fabrice Jaine are two PhD students that are involved in Project Manta and are collaborating with the plankton CMAR lab at the Ecosciences Precinct at Dutton Park.

Project Manta is led by Dr Kathy Townsend (University of Queensland), and is a multidisciplinary study of manta rays, established in 2007, providing much needed biological information about the species in eastern Australia. This study is using photo-identifcation, field observations, satellite and acoustic tracking, plankton sampling and ecological modelling to unravel the manta rays biology and ecology in this part of the globe.

The work Project Manta has been carrying out has recently been captured by Kaufmann Productions in a documentary aptly named, 'Project Manta'. The film has been nominated as a finalist for many top awards including Best Conservation Program at the Jackson Hole Wildlife Film Festival in the USA, best science, technology and environment documentary at the Australian ATOM awards, and has received a top award from the Celebrate the Sea Festival in Asia for outstanding achievement in a feature documentary.

It looks like Project Manta will premiere in Australia on:

• 'Manta Mystery' on Nat Geo Wild: **Wednesday, 30. November 2011 @ 7.30 pm** (http://natgeotv.com.au/tv/manta-mystery/)

• 'Project Manta' on ABC: **Sunday, 19. February 2012 @ 7.30 pm** on ABC 1…tbc

Watch the documentary to learn more about manta feeding and their planktivorous prey. Anita Slotwinski's microscopic images of zooplankton feature in the feeding segment.

The plankton CSIRO group at the Ecosciences Precinct at Dutton Park are now collaborating with Gisela Kaufmann and Carsten Orlt of Kaufmann Production and working towards producing a documentary on plankton…watch this space!

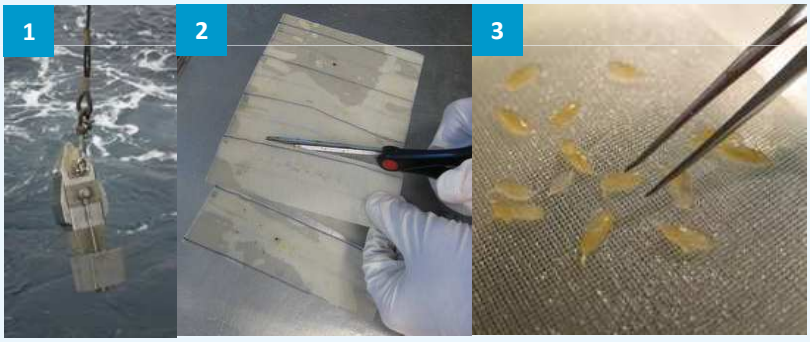
AusCPR Methodology: How do we collect data?

1. The CPR is towed 100 metres behind the ship at about 10 metres water depth. It is towed for about 400 nautical miles per 'tow' and plankton is trapped between layers of silk in an internal cassette.

2. The internal CPR cassette is returned to the lab within a few days of towing and the silk samples are unrolled and cut into segments.

3. Silk segments are analysed for phyto- and zooplankton.

If you are interested to learn more about the methodology please visit our website http://imos.org.au/auscpr.html



Note: The methods used by AusCPR are a combination of SAHFOS and SO-CPR methodology. For further information go to http://www.sahfos.ac.uk/about-us/cpr-survey/the-cpr-survey.aspx and http://data.aad.gov.au/aadc/cpr/

If you would like to join the

Friends of the AusCPR Survey

mailing list and receive newsletters and updates on research and developments please email Anita.Slotwinski@csiro.au

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IMOS Integrated Marine Observing System

CSIRO

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