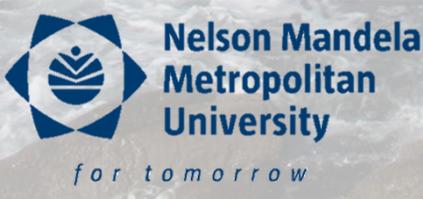


Institute for Coastal and Marine Research (CMR)

Report

2016





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List of Abbreviations

ACEP	- African Coelocanth Ecosystem Project
ASCLME	- Agulhas and Somali Current Large Marine Ecosystems Project
BCLME	- Benguela Current Large Marine Ecosystem
BCRE	- Bayworld Centre for Research & Education
CIRAD	- French Agricultural Research Centre for International Development
CMR	- Institute for Coastal and Marine Research
CNRS	- French National Centre for Scientific Research
CONICET	- The National Scientific and Technical Research Council
CSIR	- Council for Scientific and Industrial Research
DAFF	- Department of Agriculture, Forestry and Fisheries
DEA	- Department of Environmental Affairs
DHET	- Department of Higher Education and Training
DoE	- Department of Education
DOS	- Dean of Students
DWS	- Department of Water and Sanitation
EBSA	- Ecologically or Biologically Significant Areas
EMC	- Emergency Medical Care
IBSS	- International Bibliography of the Social Sciences
ICR	- Institute for Coastal Research
ICRM	- Institute for Coastal Resource Management
IECM	- Institute for Environmental and Coastal Management
ILOSA	- International Laboratory for Ocean Sciences and Education in Africa
IMCC	- International Marine Conservation Congress
IOD	- Injury On Duty
IOI	- International Ocean Institute
IOU	- Injury On Duty
IRD	- Institut de Recherche pour le Développement
IRSTAE	- National Research Institute of Science and Technology for Environment and Agriculture
ISI	- International Scientific Index
MAPRU	- Marine Apex Predator Research Unit
MSP	- Marine Spatial Planning
NERC	- Natural Environment Research Council
NMB	- Nelson Mandela Bay
NMMU	- Nelson Mandela Metropolitan University
NRF	- National Research Foundation
OH&S	- Occupational Health and Safety
RA	- Research Associate
RDU	- Research Diving Unit
REDISA	- Recycling and Economic Development Initiative of South Africa
SAB	- South African Breweries
SADC	- Southern African Development Community
SAEON	- South African Environmental Observation Network
SAIAB	- South African Institute for Aquatic Biodiversity
SAIMI	- South African International Maritime Institute
SAMSS	- South African Marine Science Symposium
SANCOR	- South African Network for Coastal and Oceanic Research
SANParks	- South African National Parks
SARChI	- South African Research Chair Initiative
SRU	- Sustainability Research Unit
SWE	- Shallow Water Ecosystems
THRIP	- Technology and Human Resources for Industry Programme
UPE	- University of Port Elizabeth
WESSA	- Wildlife and Environment Society South Africa
WIORI	- Western Indian Ocean Upwelling Research Initiative
WRC	- Water Research Commission



Message from the Director

In my position as CMR Director, I look forward to providing *strategic leadership and co-ordination*. Dr Anton McLachlan put excellent systems in place in 2016, and we can now move forward in these exciting times where there is a focus on coastal and marine issues. We have great capacity and opportunities across Faculties, with the Research Chairs and our Research Associates. We have many local and national partners (e.g. SAEON, SAIAB, DEA, DAFF, DWS) and growing international interest in partnering with NMMU. Our new Ocean Science Campus will provide a common space where we can interact and explore collaborative opportunities across Faculties and with our partners.



NMMU has developed a range of marine and maritime education and training, research, innovation and engagement programmes to support the continent's blue economy. Partnerships with other universities, the Nelson Mande Bay Metro, government and key industry players are in place to ensure a collective drive towards embracing the untapped potential of the oceans economy in a sustainable manner.

In 2017, the CMR focus will be on assisting with the Ocean Sciences Campus, promoting Faculty research collaboration and providing a *stimulating environment* for research and debate for all members, particularly postgraduate students. Hosting of the South African Marine Science Symposium (SAMSS) in July is an important event where we can showcase our activities and initiate new discussions.

Best wishes to all for a productive year!

Professor Janine Adams

CMR Director

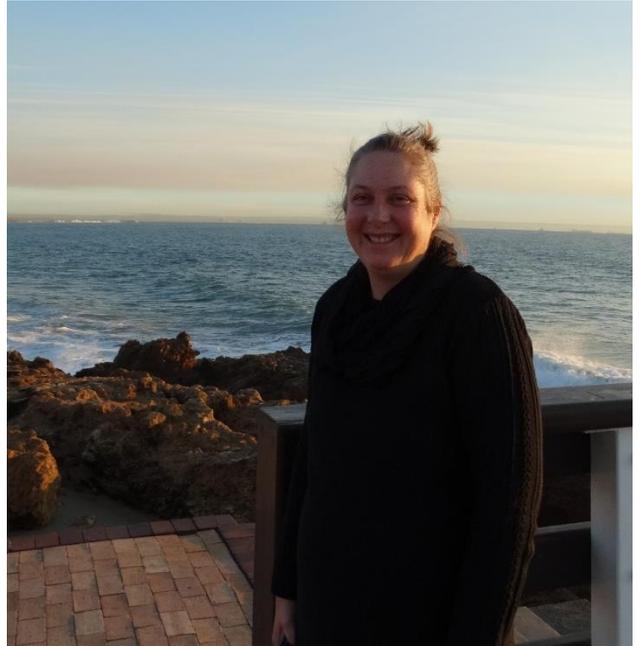
Department of Botany



Message from the Deputy Director

The institutional direction the CMR has embarked on to foster appreciation for different research paradigms is an exciting one. The opportunities to grow cross and *multidisciplinary collaboration* essential to address increasing global and local environmental and social concerns is ably driven by CMR within NMMU and externally.

My historical connection to the CMR and academic path assists me as Deputy Director. I have fond memories of the CMR (and previous iterations) and cut my teeth as a postgraduate student in Zoology on projects under the leadership of Professor Robertson. Later, I assisted Professor Bate as a research admin assistant and now, many years down the line, I find myself as a Deputy Director of the Institute.



Academically I have always been drawn to research and the application of knowledge from different perspectives and am now in the *Faculty of Business and Economic Sciences*. This evolution from pure natural sciences to holistic discourses has afforded me the opportunity to engage with different disciplines and now bring them into the CMR.

The value of being a member of the CMR as a postgraduate student was being exposed to different real world research problems and working with diverse teams. Now, as a member, it has enriched my own research endeavours and helped develop meaningful research partnerships.

First and foremost my role is to support the CMR Director in achieving the goals of the Institute. My vision for CMR is to provide multidisciplinary research opportunities and grow membership from all Faculties in NMMU. One of the ways of achieving this vision is to provide collaborative opportunities to build postgraduate and staff capacity through international collaboration and provide support to multidisciplinary research projects.

Mrs Bernadette Snow

CMR Deputy Director
Department of Development Studies



Research Overview

Introducing the CMR

The tradition of coastal and marine research at the Nelson Mandela Metropolitan University (NMMU) goes back a long way to the University of Port Elizabeth (UPE) in the early 1970's. This grew from a few postgraduate students to staff from several disciplines by the early 1980's. First initiated as the Institute for Coastal Research (ICR) at UPE in 1983, *collaborative interdisciplinary work* on the coast and ocean is therefore already three decades old at NMMU. Starting as a forum to promote collaboration among three academic departments (Botany, Zoology and Earth Sciences), the ICR expanded its suite of activities in the 1980's to draw in the Department of Oceanography and to take on environmental consulting work. The initial funder was the Department of Environmental Affairs (DEA), followed by a variety of sources, most notably a major grant from South African Breweries (SAB), which underwrote ICR activities into the 1990's.

The Institute underwent a series of transformations up to 2007, changing name to the SAB Institute for Coastal Resource Management (ICRM) in 1997 and then to the SAB Institute for Environmental and Coastal Management (IECM) in 2002 and focused mainly on commercial contracts for environmental consulting. It then operated as a unit in the Science Faculty until the NMMU strategic decision in 2013 to develop a strong marine and maritime institutional theme. This was expounded as the University's signature tune in the University's Maritime and Marine Sciences Strategy for 2016-2020. It resulted in the establishment of the Institute for Coastal and Marine Research (*CMR*), which was approved by Senate and Council in 2014. This emerged from recognition that marine and coastal ecosystems are threatened and NMMU must play a role in addressing this problem.





Initially defined as an entity within the Faculty of Science, the CMR was elevated to a University-wide institution in 2016, reporting directly to the Deputy Vice-Chancellor: Research and Engagement. The appointment of a Director at the start of 2016 has also contributed to starting the activities of the Institute, including reaching out to other NMMU Faculties and entities in addition to Science. January 2016 thus marked the initiation of the full range of activities of the CMR. The Institute now spans *six Faculties* and includes members from *seven entities* external to the University. With its pending move to the University's new *Ocean Sciences Campus*, it will play a vital role in supporting the University's drive for excellence in maritime and marine sciences.

The activities that fall under the CMR can be broadly classified as: *Research, Training and Consulting.*



CMR Pillars

Vision

CMR aims to be a *leading marine sciences institute*, conducting cutting-edge research, building capacity and advancing our understanding of the coastal and marine environment, to serve the needs of South Africa, the continent and beyond in a sustainable manner.



Mission

CMR strives for excellence in *interdisciplinary research* and training related to coastal and marine environments. This will advance scientific knowledge and the NMMU institutional research themes, provide a scientific basis for management strategies that optimise maintenance of biodiversity and sustainable use of resources, and contribute to the education of the community at large in matters pertaining to the coast and ocean.

Values

The activities of the Institute will promote the six values of NMMU, with special emphasis on the following three:

- ◆ *Respect for the natural environment* and adherence to the principle of sustainability
- ◆ Inclusion of staff and students from previously disadvantaged backgrounds to promote *diversity*
- ◆ Emphasis on *excellence* in all aspects of research, training and outreach





Objectives

CMR is a *key element in the NMMU vision* of providing leadership in generating knowledge, innovation, education and skills development relating to coastal and marine environments. In addressing this, CMR's objectives are to:

- ◆ Provide a forum to enhance collaboration among academics, researchers and professionals, and build interdisciplinary teams of critical mass to address complex issues.
- ◆ Create a strong brand and market this collective expertise to develop partnerships and source funding in key areas.
- ◆ Build capacity, knowledge and skills through research-based postgraduate training and short courses.
- ◆ Provide community service through professional consulting, service on external boards and committees, and broader outreach.
- ◆ Provide infrastructure support for research, especially relating to diving, boating and specialised marine equipment.
- ◆ Host meetings (regional, national and international) and other activities of wide interest to showcase specialised marine equipment.
- ◆ Be the first point of contact for marine issues at NMMU and communicate, on behalf of membership, with the external community and top management.



Thematic Areas

The wide range of coastal and marine research, consulting, public engagement and capacity building activities undertaken under the auspices of CMR can be grouped under *three broad themes*. Under each thematic area there are numerous individual researchers, students and research groups. Research under these thematic areas contribute to decision support to coastal and marine managers.



Living Resources & Food Security

The focus for research under this Theme is investigating and developing *coastal and marine living resources* which are, or can be, utilised as food resources, with emphasis on sustainability. The most active project is the work on the marine ranching of abalone in Port Elizabeth and Hamburg. This is undertaken along with Rhodes University and the University of Fort Hare. The project is reliant on research on fisheries management, fisheries biology, and ecological effects associated with abalone ranching. The Large Marine Ecosystems based research projects, aimed at solving food security and poverty alleviation issues in East Africa, is one of the most exciting future prospects. This is driven by Prof Mike Roberts' SARChI Chair and the University of Southampton. The expansion of the abalone ranching research is planned for other areas in the Eastern Cape (Hamburg, Haga Haga, Mazeppa Bay), with THRIP funding secured for the next three years. The second phase of the Ocean Sciences Campus will be implemented, where plans are being developed for more infrastructure for aquaculture research. This Theme is coordinated by *Dr Paul-Pierre Steyn*.

Biodiversity & Conservation

Most of the research under this Theme is applied science that has direct links to *policy and management* of coastal and marine ecosystems. The ecology of rocky shores, sandy beaches, mixed shores, stromatolites, estuaries, mangroves, wetlands and subtidal reefs are studied. There are well-established working groups doing long-term ecological research on changes in phytoplankton communities, studying shallow water ecosystems (SARChI Chair), understanding the spatial ecology and behaviour of focal species (MAPRU) and a team working on sea turtle conservation (mostly in the South-West Indian Ocean). Marine Spatial Planning and Systematic Conservation Planning is a key area of the work done, ranging from research mostly under the MSP SARChI Chair to contracted work (German-funded Marine Spatial Planning Management and Governance Project). Members continue to engage and interact with each other and with their respective research groups. Nations seek to build their economies and extractive use is emerging and accelerating globally. Pressures on coastal and marine systems are increasing, creating many opportunities for future work under this Theme. The Theme coordinator is *Dr Linda Harris*.



Global Change



This covers a range of projects aimed at monitoring and understanding *change*, both anthropogenic and natural, and how this impacts coastal and marine systems and human communities. MAPRU coordinates five global change projects. Three PhD projects are linked to ongoing monitoring in Algoa Bay by SAEON Elwandle Coastal Node, and the Botany Department is starting to yield interesting insights into the oceanographic and pelagic ecosystem dynamics of the region, including the causes and effects of Harmful Algal Blooms induced by an invasive dinoflagellate. Prof Christo Fabricius (Sustainability Research Unit) is leading a team of collaborators from Arizona State University, University of Exeter and three French Institutes (CIRAD, IRSTEA, CNRS) to develop appropriate responses to risk and vulnerability in coastal zones. Future prospects include a new WRC-linked project in the Botany Department that will monitor responses of coastal habitats to sea level rise, as well as an investigation into bottom-up influences of climate change on endangered marine top predators via trophic coupling and retroactive top-down influence of these predators on their environment. *Dr Shaun Deyzel* (SAEON) is the coordinator for this Theme.



Research Diving Unit (RDU)



The Research Diving Unit is housed within the CMR and supports *marine research* and other related *academic programs* (including *consulting* projects registered at NMMU) by providing access to diving and boating training, equipment, logistic support and expertise.

The mandate of the RDU is threefold. It should:

- ◆ Provide and develop commercial diver and skipper capacity within the University through providing training, qualifications and experience to students and researchers.
- ◆ Provide operational support for researchers to facilitate marine research.
- ◆ Provide Safety, Health, Environmental and Quality Assurance in all its training, personnel, operations and equipment as legally enforced under the OH&S Act (85) 1993 and Diving Regulations 2009, amongst other legislation that may be applicable.

The Head of the RDU, *Mr Anton Cloete*, is an experienced commercial diving instructor, who reports to the CMR Director. The RDU is responsible for:

- ◆ Diving Occupational Health and Safety
- ◆ Overseeing diving support for research
- ◆ Offering diver training courses
- ◆ Maintenance and replacement of RDU diving equipment

The RDU Head appoints contract personnel as required, and this may include supervisors, skippers, divers and crew. This is an important legal structure which ensures the appointees are captured within the University OH&S framework as employees for remuneration and IOD purposes. No personnel can work as part of the dive team for NMMU unless appointed as such. For OH&S Act compliance, the RDU reports directly to the NMMU OH&S officer.





2 016 was the RDU's fourth year of a five year plan to consolidate its operations under the CMR. Diving activities took place on a total of **104 operational dive days** during 2016, where subtidal and marine research was facilitated. This equates to 2,1 diving operations per week. These include various research projects under the supervision of Dr Pierre Pistorius, Dr Stephanie Plön, Dr Malcolm Smale and Dr Paul-Pierre Steyn. Service level agreements with Aurecon, Lidomix and Zwembezi were also honoured.

Training

Diver training courses were completed as follows:

- 2** x Class 4 Commercial Diver Training Course upgrades
- 1** x Class 4 Supervisor Training Course
- 1** x Class 4 Supervisor Training Course

Some courses had to be cancelled due to infrastructure not being serviceable, as a result of agents not being able to access South Campus due to Fees Must Fall complications. The pass rate for the watermanship assessment was low, with a 75% failure rate. This issue will be addressed by potential commercial diving candidates first being required to assist as crew members on the boats during diving operations, and to complete surface swimmer induction before attempting watermanship assessment.

The RDU continued to support the Emergency Medical Care Department by providing practical crew training for the 2nd and 3rd year paramedic students for their water rescue module.

Support

For the first time, the RDU was serviced by a diving medical emergency service provider – giving the RDU all-year medical support, including aero-medical evacuation. This was done to ensure compliance of the OH&S Act, as well as Diving Regulations. The dive team was also given commercial diving medical cover to meet the shortcomings of the IOD system.

Department of Labour Audits

The RDU's commercial diving school was audited by the full Department of Labour Advisory Board in March 2016. A 91% result was achieved. During 2017, the backlog of unprocessed documentation and maintenance will ensure that the next audit is passed with the same level of competence and the accreditation is not jeopardised. The RDU continued to engage the Department of Labour regarding the proposed changes to the Diving Regulations and Codes of Practice. This included promoting scuba diving as a rescue discipline.

Financial Matters

The RDU purchased a high pressure breathing air compressor and storage containers that enabled diving operations to continue during 2016. The purchase of a utility vehicle ensured that transport to diving operations was not impacted. Additional capital purchases included four twelve litre steel diving cylinders. The RDU concluded 2016 with a total of R 105 500 in funds, and the expected budget for 2017 is R 176 270.

Marine Apex Predator Research Unit (MAPRU)

MAPRU was established in early 2016 and is a research unit that falls within the CMR. It is led by *Dr Pierre Pistorius*.

Goals

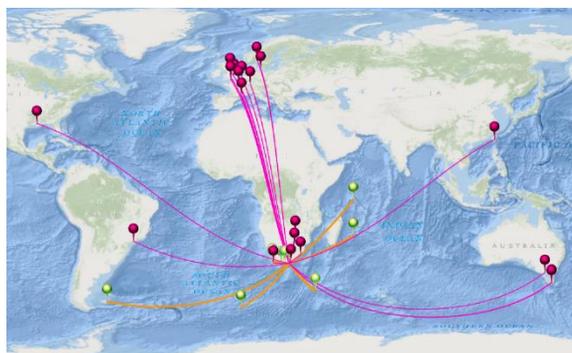
Conduct research on marine top predators (seabirds, seals, sharks, cetaceans) particularly in relation to global change, conservation and sustainable resource management.

Provide learning opportunities and train postgraduate students in various aspects involving marine top predators.

Be involved in various forms of engagement, using charismatic predator species to stimulate public interest in marine biodiversity and conservation.



The threatened status of many marine top predator species results in MAPRU's research having a strong *conservational focus*. Marine top predators are at the upper limit of the food chain, and they are therefore ideal indicators of global change and areas of high productivity. MAPRU will use marine top predators at the species and community level to better understand ecosystem changes and for conservation based spatial planning. Projects focus on Algoa Bay, the South African coast line and the sub-Antarctic region, but also extend into Mozambique and Namibia. National and international links exist with the following institutions/entities: University of Pretoria; University of Cape Town; Rhodes University; Department of Environmental Affairs; Australian Antarctic Division; Durham University (United Kingdom); Norwegian Polar Institute; Institute for Research Development (France); Université de Strasbourg (France); University of Tasmania; University of Reunion; University of Oslo; Deakin University (Australia); Centre d'Etudes Biologique de Chizé (France); South Atlantic Environmental Research Institute; Falklands Conservation; Antarctic Research Trust (Zürich).





Members

Members are mostly based at NMMU, but some are also hosted by other institutions. Many collaborative links and relationships have been formed with international researchers and institutions.

During 2016, MAPRU published 21 papers membership consisted of the following:

8 Staff, contract and research associates

6 Post-doctoral Fellows

15 Postgraduate students



CMR Strategies

The following strategies will be used to address the CMR's mission and meet its objectives. The timeframe is envisaged as 2016 – 2017. These strategies will enhance our ability to provide decision support to coastal and marine managers through research excellence while embracing the principle of sustainability.

Enhance the breadth of CMR collaboration and the range of coastal and marine expertise across the University and externally.

1

Under the banner of the NMMU marine vision, use workshops, interdisciplinary seminars and other platforms, plus the location and facilities of the Ocean Sciences Campus, to draw in a wider pool of collaborators across faculties and other units in the University.

Increase funding for research, studentships and resources to promote research and training.

2

Funding needs to be actively sourced from contemporary sources such as *The Phakisa Initiative* to grow a 'blue' economy based on marine and coastal resources and sustainable tourism, and the Flagship Project for large interdisciplinary programmes. Key stakeholders who are funders must be engaged with, and international partnerships and other sources of funding must be pursued.

Strengthen branding and marketing to maintain a high profile nationally and internationally.

3

The website needs to be kept up to date, brochures and other outputs (such as popular articles) need to be produced, meetings, conferences and public lectures need to be held to showcase the CMR expertise and activities.

Build, grow and develop expertise and fill gaps in critical areas (such as fisheries, sedimentology, coastal engineering) to build capacity and broaden expertise.

4

SARChI Chairs are used to gain expertise in key areas, new post-graduate programmes need to be developed in target areas, and partnerships to draw in external experts through exchange programmes and other mechanisms must be developed.

Develop, maintain and expand infrastructure in the new Ocean Sciences Campus and across campuses to strengthen marine research capacity.

5

Partnerships need to be strengthened with organisations (such as SAEON and SAIMI) to increase space, equipment, resources and efficiency through specialist technical expertise.



Governance Structures

The CMR is headed by a Director and is assisted by a Deputy Director. They provide overall vision and leadership and assume responsibility for the activities of the CMR. The Director is assisted by a *Management Committee*, representative of a wider membership, who oversee and guide the running of the Institute. The Director (on behalf of the Management Committee) reports to the Deputy Vice-Chancellor: Research and Engagement, who chairs an *Advisory Board*, including external stakeholders

Dr Anton McLachlan filled the position of Director (part-time on a contract basis) during 2016, providing strategic and academic leadership. He was supported by Prof Ronel Nel as the Acting Deputy Director. Both of these leaders stepped down at the end of 2016, and were to be succeeded by Prof Janine Adams (Botany Department) and Mrs Bernadette Snow (Development Studies Department) as Director and Deputy Director respectively as of 1 January 2017.

Two CMR Committees were constituted as follows in 2016:

MEMBERS	ADVISORY BOARD	MANAGEMENT COMMITTEE
DVC: R & E	Chair	
Dean of Science	X	X
Director of Institute	X	Chair
Deputy Director of Institute	X	X
DOS of Environmental Sciences	X	X
Three of Research Group Coordinators	X	X
Representative: Oceans and Coasts (DEA)	X	
Representative: National Research Foundation (NRF)	X	
Regional Director: ASCLME	X	
Representative: SAEON	X	X
Representative: SAIAB	X	
Representative: BCRE	X	X
Representative: NMB Metro	X	
Representative: Transnet National Ports Authority	X	
Representative: DAFF	X	
Head: Research Diving Unit		X



The Advisory Board Committee advises the Management Committee. It is then the Management Committee's responsibility to act on the recommendations from the Advisory Board. Two meetings of the Advisory Board should be held each year, and were as follows for 2016:

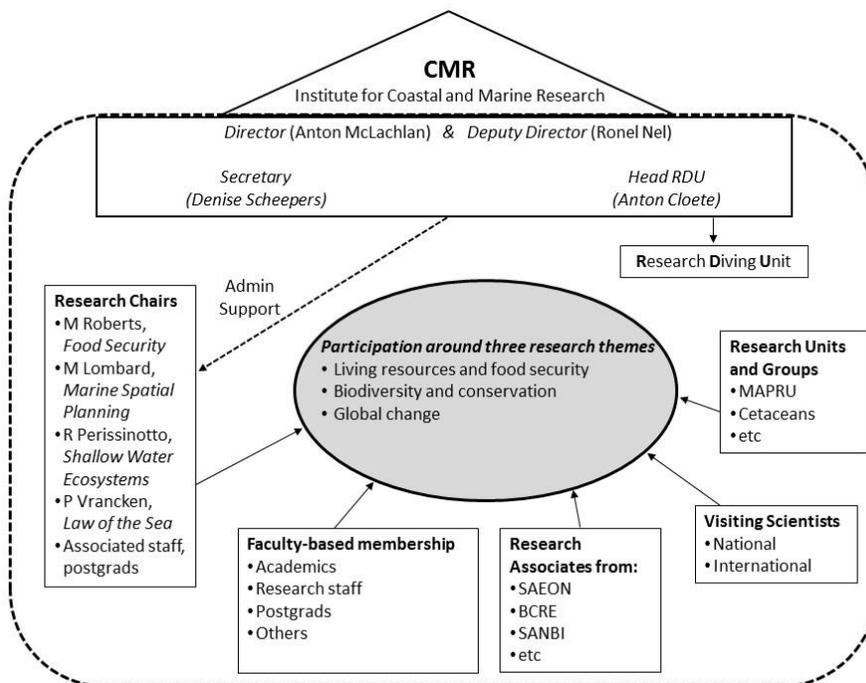
- ◆ 11 April
- ◆ 24 September

Three meetings of the Management Committee should be held each year. These took place as follows:

- ◆ 21 April
- ◆ 14 July
- ◆ 24 October

Where necessary, a number of informal meetings were held between the Director, Deputy Director and the DOS of Environmental Sciences to discuss issues relating to the day-to-day running of the CMR. The head of the Research Diving Unit (RDU) was involved in some of these meetings.

The 2016 CMR structure is outlined in the diagram below.



Goals & Targets for 2016

The following goals and targets were identified for 2016:

- ◆ Launch the CMR Institute as a University-wide entity outside the Faculty of Science.
- ◆ Run research diver training courses through the Research Diving Unit.
- ◆ Continue research and postgraduate training on coastal and marine issues.
- ◆ Become involved in the planning and coordinating of the 2017 SAMSS Conference, to be held in Port Elizabeth (Boardwalk Centre) in July 2017.
- ◆ Make use of opportunities under *Operation Phakisa*.



The following goals and targets were achieved in 2016:

- ◆ The post for the CMR Director was advertised and filled part-time, with a full-time candidate identified late in 2016 to take over in 2017.
- ◆ Two Advisory Board and three Management Committee meetings were held.
- ◆ Two successful diver training courses were run through the Research Diving Unit .

Highlights & Special Achievements



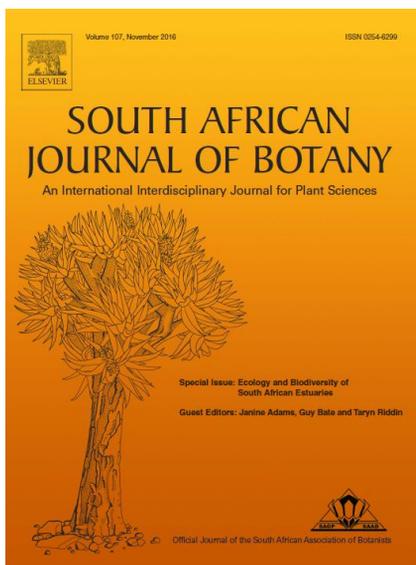
Prof Nadine Strydom was awarded NMMU Researcher of the Year.



The Faculty of Science approved the establishment of the Marine Apex Predator Unit (MAPRU), recognising a very active research group in the CMR. This was launched in June 2016.



Transformation continued with an increasing number of equity students and students from disadvantaged backgrounds in the postgraduate ranks.



Prof Janine Adams, Prof Guy Bate and Dr Taryn Riddin edited a special issue of the *South African Journal of Botany* on the “Ecology and Biodiversity of Estuaries”. This volume contains 22 original scientific articles focusing on the botany of estuaries (Volume 107).



The RDU supervised 104 operational research diving days, and offered a total of five diver training courses.



The CSIR Campus became official NMMU property and is the site for the new Ocean Sciences Campus. The CMR plans to move to this new Campus in 2017, and this new facility will create opportunities to explore further transdisciplinary activities.



Dr Lorien Pichegru was awarded a 2016 WESSA Award for conservation efforts in the Eastern Cape.



Partnerships with SAEON, Bayworld/BCRE, Oceans & Coasts, SANParks, SAIAB and other national entities were continued and extended.



Jonathan Handley (MAPRU) presented *Habitat influence on foraging characteristics of Gentoo penguins at the Falkland Islands*, and was awarded the Best Student Presentation Award at the 9th International Penguin Congress.

Summary of 2016 Outputs



Members of the CMR and their students enjoyed an exceptionally productive year. This included the following outputs:

18 International conference presentations from **20** international conferences attended

30 National Conference presentations from **17** national conferences attended

63 ISI and BSS Journal Articles published

7 DoE Articles Published

1 Book Published

1 Book Chapter Published

24 Additional Publications

12 Research Reports Produced

6 Completed Masters degrees

4 Completed Doctoral degrees

Co-hosted the ILOSA Workshop, in collaboration with Ma-Re (University of Cape Town) and ICEMSA





People

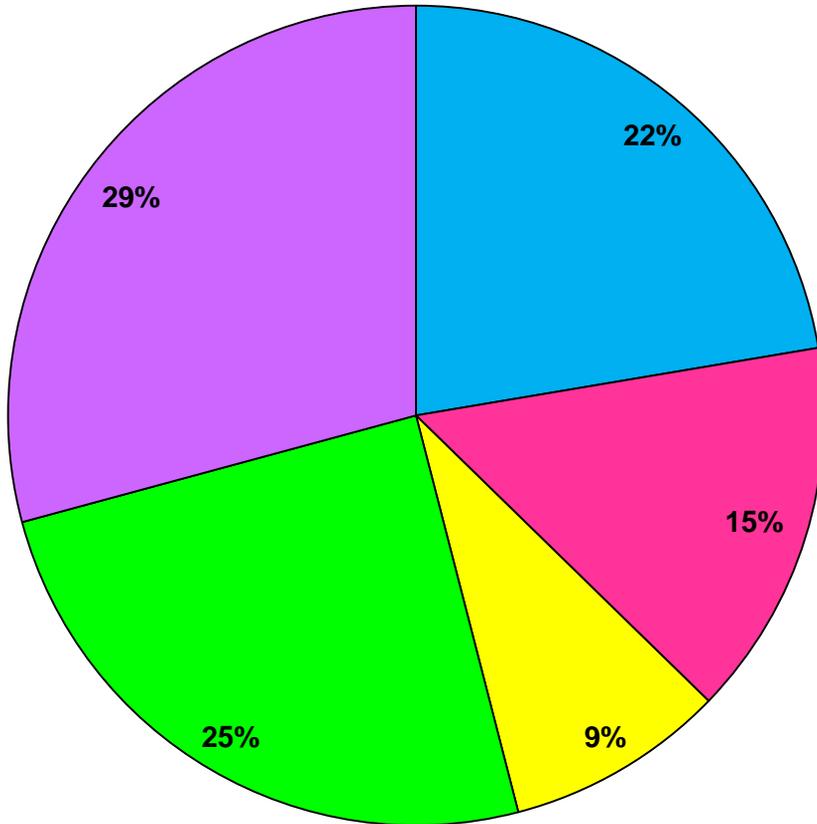
Human Resources

CMR members are academic, research or technical staff at NMMU or Research Associates connected with various departments and entities at the University, as well as their postgraduate students. The Secretary was part-time (shared with REDISA) and only the Head of the Research Diving Unit was a full time appointment in the CMR. Appointing a Director was a priority for 2016, and Prof Janine Adams was the candidate put forward to take over this role from Dr Anton McLachlan in 2017. In 2016, the CMR membership exceeded **100**, and this included academics, researchers and RAs from the following Departments:

ACADEMICS	STUDENTS	RESEARCH ASSOCIATES	DEPARTMENT / INSTITUTION
2	0	0	AEON
0	0	3	Bayworld (BCRE)
8	22	2	Botany
1	1	0	Centre for Coastal Paleoscience (CCP)
1	0	0	Chemistry
2	0	0	CMR
0	0	1	CSIR
1	2	0	Development Studies
1	0	0	Earth Stewardship Science
3	0	0	Economics
1	0	0	Emergency Medical Care
3	0	0	Engineering
1	1	1	Geosciences
1	0	0	Mathematics and Applied Mathematics
1	0	0	Natural Sciences (George Campus)
0	8	0	Oceanography
1	0	0	Operations Management and Maritime
1	0	0	Political Sciences and Conflict Studies
0	0	5	SAEON
0	0	1	SAIAB
0	0	1	SANBI
0	0	0	SANParks
4	35	0	SARChI Chairs
1	0	0	Statistics
0	0	1	University of the Witwatersrand
4	32	6	Zoology



2016 Membership

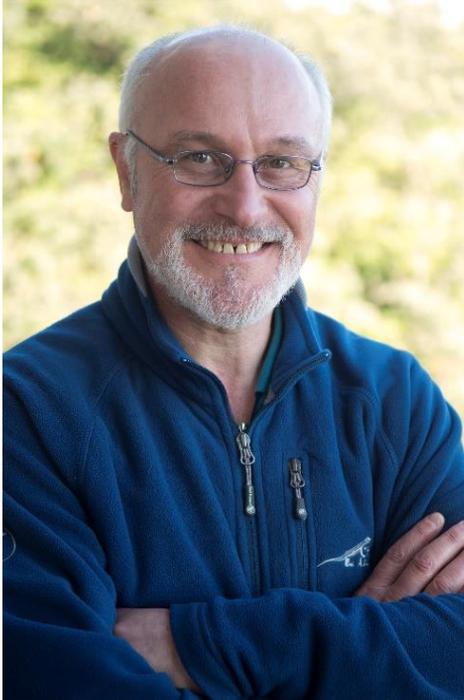


■ Staff ■ Research Associates ■ Post-Doctoral Fellows ■ Masters Students ■ Doctoral Students



SARChI Chairs

Four SARChI Chairs fall under the CMR:



Shallow Water Ecosystems
Prof Renzo Perissinotto



Marine Spatial Planning
Prof Amanda Lombard



Law of the Sea
Prof Patrick Vrancken



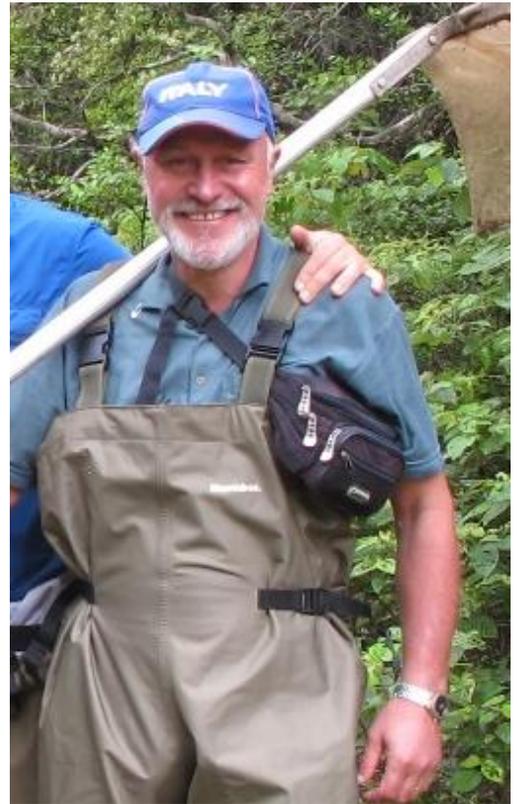
Food Security (Oceanography)
Prof Mike Roberts

Shallow Water Ecosystems

Water is a scarce commodity in southern Africa, where many aquatic ecosystems are currently on a trajectory of rapid deterioration. The sustainable use of our water resources, and their rehabilitation where necessary, requires that *adaptive management structures* are continuously provided with scientific knowledge on the processes that govern aquatic ecosystems and their health.

Research under this SWE Chair, led by Prof *Renzo Perissinotto*, focuses on integrated ecosystem functioning of estuarine and coastal systems. The four major projects that this Chair is involved in, are:

- ◆ Biodiversity, ecological functioning and rehabilitation of Lake St Lucia, iSimangaliso Wetland Park.
- ◆ Characterisation of micro-estuary systems along the eastern and southern Cape coast.
- ◆ Biogeochemistry of living stromatolites along the Eastern Cape coastline.
- ◆ Baseline study of the biodiversity and ecology of wetlands in the Karoo region earmarked for shale gas exploration.



The activities of this Chair will remain focused around the current four research areas, with greater expansion envisaged for the stromatolite study. Important links are consolidated locally and internationally with a view to escalate investigations on the biogeochemical dynamics of the extant systems and also on the comparative structure between extant and fossil systems from the Archean eon. The St Lucia project will take a new dimension after the reconnection of this estuary with the Mfolozi River, which is currently being completed through the removal of the island of dredge spoil accumulated over the last century. The system will enter a new rehabilitation phase, during which the effects of a return of freshwater inflow from the Mfolozi river will need to be closely monitored, both in relation to silt accumulation and to potential eutrophication. While the research activities on the ephemeral wetlands of the Karoo region earmarked for shale gas exploration and around the characterisation of micro-estuaries along the entire South Africa coast will be sustained, new initiatives aimed at investigating the pelagic productivity of the Algoa Bay hope-spot will be developed in partnership with SAEON and the SARChI: Food Security (Oceanography), once these institutions all come together within the new Ocean Sciences Campus of the University.



Marine Spatial Planning



2016 marked the first year for this SARCHI Chair. Prof **Amanda Lombard** leads this Marine Spatial Planning Research Group, and their vision is to embark on research that will inform ecosystem-based Marine Spatial Planning in South Africa.

Ocean space is getting increasingly crowded, and the boundaries of extraction are being pushed to the limit. Extractive ocean uses need to be managed more sensibly, ensuring that healthy ocean ecosystems are maintained. It is of vital importance that young professionals are equipped to deal with the science, policy and socio-economic aspects of managing ocean use. To achieve this, transdisciplinary research is a necessity.

Two Post-Doctorate Fellows, three Doctorate, four Masters and one LLM candidate (in collaboration with SARCHI: Law of the Sea) formed part of the 2016 research group.

This Chair is involved in two projects that fall under the African Coelocanth Ecosystem Programme (ACEP). The CSIR collaborated on two projects: Seamless and Scalable Coastal and Marine Spatial Planning for the Ocean Economy of Africa, and a comprehensive National Coastal Assessment for South Africa. An additional contract project includes delivering expert services for the description of the Ecologically or Biologically Significant Areas (EBSAs) of the Benguela Large Marine Ecosystem (BCLME) and the assessment of their vulnerabilities. The most important 2016 outputs include five publications in internationally recognised journals, and a Special Session convened for the 4th International Marine Conservation Congress (IMCC) at St. Johns, Canada.

Future work includes trans-disciplinary and multi-institutional collaborations. This Chair is involved in the development of the *Master of Coastal and Marine Spatial Planning* programme. A proposal to UK funders for *Enhancing Capacity for Open Data in Education* is being developed in collaboration with the Memorial University (Canada) and the University of Dar es Salaam (Tanzania). In partnership with the Eduardo Mondlane University (Mozambique) the Ocean Stewards Programme will be extended. A proposal has been submitted to work on the planning project: *Symbioseas – Regionally co-operative biodiversity conservation and MSP in the Southwestern Ocean through building scientific knowledge and research capacity* (in collaboration with the Simon Fraser University, Canada). In support of South Africa's new marine spatial planning legislation, a proposal to develop South Africa's first Marine Area Plan, focusing on Algoa Bay, has been submitted.



Law of the Sea

The research undertaken by the Chair: Law of the Sea and Development in Africa, focuses on three areas:

- 1 South Africa and the law of the sea, including the legal regime governing the South African continental shelf and the exploitation of its resources.
- 2 Development in Africa and the law of the sea, including relevant indigenous law – research at international and comparative level on:
 - The East coast of Africa and the Indian Ocean
 - The West coast of Africa and the Atlantic Ocean
 - The Southern Ocean and Antarctica
- 3 The legal aspects of marine tourism.



Prof *Patrick Vrancken* is a member of the International Law Association's Committee on International Law and Sea Level Rise. He is also a member of the steering committee of the South African International Maritime Institute. His research focuses on State ocean jurisdiction, the law of the sea in Africa, transnational organised fisheries crime, port law and marine tourism law. Furthermore, he is also interested in the legal developments that affect African coasts and the maritime environment, as well as incorporating the international law of the sea into the domestic legal system of African States. This Chair has been hosted by NMMU since 2013.

During 2016, this Law of the Sea Chair had ten PhD and five Masters students that were involved in marine projects. These projects cover the following aspects:

- Labour rights of fishers in Namibia
- Maritime piracy legislation for Nigeria
- Marine scientific research in Antarctica
- Legal aspects of marine spatial planning
- Legal regulation of surfing in South Africa
- The Common Exclusive Maritime Zone of Africa
- Protection of copyright aboard cruise ships at sea
- Decommissioning of offshore installations on high seas
- The safety of navigation and the role of port state jurisdiction
- The intellectual property consequences of marine bioprospecting
- African traditional fishers in the law of the sea and human rights law
- The legal framework of concession agreements relating to Nigerian ports
- The role and efficiency of international conservation instruments for turtles and turtle habitats
- Sustainable strategies for improved implementation of South Africa's marine living resources legislation
- The financial transactions Regulations impacting on corruption and money laundering in relation to ports and harbours in South Africa

Food Security (Oceanography)

The Western Indian Ocean is at a crossroads: either it adopts an ecosystem approach to fisheries, or depleted fish stocks will lead to a humanitarian disaster as in the Bay of Bengal. The region has the highest density of Lowest Developed Countries in the Indian Ocean, and has 60 million people dependent on the ocean for their food and livelihoods. It faces several big developmental challenges. Over-exploitation, habitat destruction, and a **changing Indian Ocean** threaten ecosystem health and hence livelihoods. In the light of Global Climate Change and ecosystem responses, poor coastal communities have low adaptive capacity. The region has very limited scientific, institutional and ocean governance capacity to address these challenges.



This UK-SA Bilateral Research Chair, under the leadership of Prof **Michael Roberts**, aims to develop and grow a regional research and training capacity in ocean science based at NMMU, and to use this capacity to undertake marine research in support of food security in the Western Indian Ocean. A full multidisciplinary research approach is required, and involves the fields of physical oceanography, biogeochemistry, plankton, trophic ecology, fisheries and food resources. The research plan acknowledges nine upwelling regions in the Western Indian Ocean which sustain ecosystems and resources.

Central to this Chair is the building of an 'Innovation Bridge' between NMMU and leading ocean science institutions in the United Kingdom (University of Southampton; National Oceanography Centre), enabling immediate access to marine robotics, satellite observations, biogeochemistry, and modelling. NMMU houses research staff and post graduate work space, ocean engineering workshops, a diving unit, laboratories and instruments, and aquaria for ocean production experiments.

2016 highlights include finalising building plans for the new Ocean Science and Food Security Centre of Excellence at NMMU. Four postgraduate students were enrolled. A visit to France secured the use of a research vessel and the full support of the IRD. The first research cruise using the research vessel *Antea* was done in October 2016. A considerable amount of time was spent applying for research funding, including a bid to the UK NERC Global Challenge Research Fund. Efforts in 2017 will focus on moving into the Ocean Sciences Campus, obtaining more deep sea oceanographic instruments and equipment and increasing the numbers of postgraduate students. The second Madagascar Ridge cruise will be undertaken, and research on the Agulhas Bank will be started.



NMMU Researcher of the Year 2016

Prof Nadine Strydom's passion for marine life stems from her childhood and led to her pursuit of a career in marine biology. Early postgraduate research focused on the planktonic stages of coastal fishes, which has grown into a speciality field of research that has now expounded to a focus on the larvae and juveniles in temperate estuaries and surf zones. Her research links spawning areas for fishes with feeding and nursery areas for larvae and juveniles and involves crosscutting research spanning the open ocean, estuary and river ecosystems with applications in fish ecology, fisheries science, aquaculture and conservation. Her research provides new knowledge on species biology and ecology, ecosystem use and sampling methodology. She was awarded the NMMU Researcher of the Year award for 2016.



Nadine is committed to cutting edge research on estuarine and nearshore ichthyoplankton research and in sharing her research in peer reviewed journals and in the public domain. During 2015, she published ten papers in internationally recognised journals, playing a part in her winning this award. Her 2016 publications record includes three papers published in internationally recognised journals, a popular article published in three different South African magazines to reach a variety of audiences, and she delivered a public lecture as part of the Algoa Bay Hope Spot initiative. She also supervised two Honours students, three MSc students and three PhD students during 2016. She is also an Associate Editor for the journal *Estuaries and Coasts* and a member of the *Coastal and Estuarine Research Federation*. At present, she is a C2 NRF rated researcher.

Her research is important because it helps *conservation authorities and policymakers* to make decisions regarding fish protection and management. Understanding fish larvae can assist with predictions about the size of future fish populations. This is critical for South Africa, since many coastal fish stocks (those targeted by shoreline and small boat anglers) are collapsed.

She has an absolute passion for all nature - terrestrial and aquatic. Exploring beyond the known has always intrigued her. She also cares a great deal about her students. Their careers and futures are important to her, and she encourages them to publish their science.



Top Rated Researchers

The NRF rating system is a key driver in the National Research Foundation's aim to build a *globally competitive science system* in South Africa. This tool benchmarks the quality of South Africa's researchers against the best in the world. Ratings are allocated based on a researcher's recent outputs and impact, as perceived by international peer reviewers. This rating system encourages high quality publications in high impact journals and outlets.

The ratings are awarded within the following categories:

- A:** Leading international researchers
- B:** Internationally acclaimed researchers
- C:** Established researchers
- P:** Prestigious Awards
- Y:** Promising young researchers

NAME	RATING	FACULTY	SPECIALISATION
Adams, JB Prof	C1	Science	Estuarine and Coastal Systems, Plant Ecophysiology
Connan, MA Dr	C3	Science	Marine Ecology, Stable Isotopes, Genetics
Cowling, RM Prof	A1	Science	Evolutionary Ecology, Conservation, Palaeobotany
De Wit, M Prof	A1	Science	Earth Systems
Fabricius, C Prof	C2	Science	Sustainability Science
Hattingh, DG Prof	C1	Engineering	Friction Processing, Manufacturing Technologies
Lombard, A Prof	C1	Science	Systematic Conservation Planning, GIS, Animal Welfare
Nel, R Prof	C2	Science	Coastal Ecology, Sea Turtles, Marine Conservation
Perissinotto, R Prof	B2	Science	Aquatic Ecology, Biodiversity, Invertebrates
Pichegru, L Dr	C2	Science	Seabird Ecology, Spatial Ecology, Conservation
Pistorius, PA Dr	C1	Science	Marine Apex Predators, Population Ecology, Global Change
Shakantu, W Prof	C3	Engineering	Building Economics, Construction Industry
Strydom, NA Prof	C2	Science	Ichthyology, Plankton Ecology, Estuarine Ichthyology
Vrancken, PHG Prof	C1	Law	Marine Law, Tourism Law and Legislation

International Collaborations

The CMR strives to build collaborations with *international* researchers. Below is a list of the international collaborations that took place in 2016:

University of Gothenburg (Sweden) and University of Southampton (UK): The CMR built strong international collaborations with both of these institutions. These relationships allow for developing a programme of staff and student exchanges.

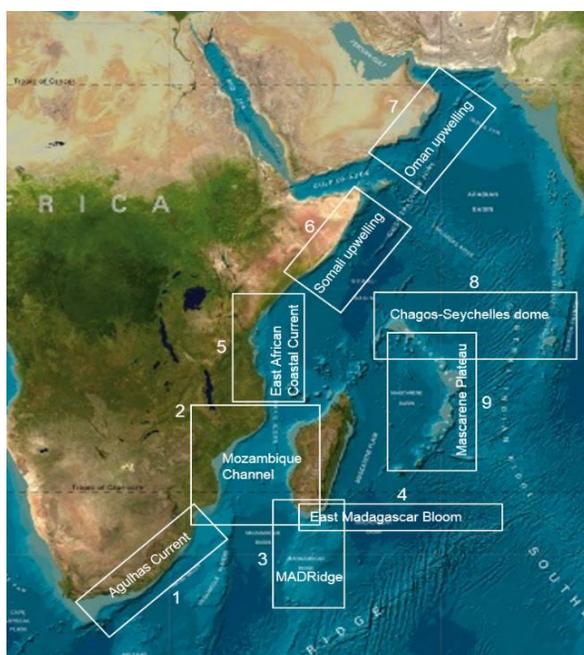
Prof Janine Adams: Visited Prof Isabel Cacador and Dr Bernardo Duarte at the University of Lisbon, Portugal, to discuss water quality, salt marshes and estuaries.

Prof Renzo Perissinotto: Prof Mark Rius and Mr Steven Bourne (respectively supervisor and PhD candidate) from Southampton University. Mr Bourne visited the NMMU from September-December 2016 to collaborate on marine species and attend the November St Lucia Estuarine Lake survey .

Prof Patrick Vrancken: Visited the University of North Carolina (Wilmington) during November to present a guest lecture on *International law implications of sea level rise*. Prof Vrancken also participated in a French delegation visit to the NMMU during April and presented *The Law of the Sea: The AU and its member states*, and he engaged with visitors from Norway during the South African Science Week (Cape Town) in November.

Prof Amanda Lombard: Dr Kerry Howell (University of Plymouth) and Dr Kerry Sink (SANBI) met in Newfoundland in Canada to discuss deep sea research proposals to the Global Challenges Research Fund (GCRF).

Prof Mike Roberts: As the incumbent of the SARChI Chair in Food Security (Oceanography), Prof Mike Roberts spent most of 2016 travelling between NMMU and the United Kingdom (University of Southampton). Prof Roberts also visited France and secured the use of a research vessel and support by the IRD. Prof Roberts spent some time aboard the research vessel *Antea*, focusing on the Madagascar Ridge.





Dr Pierre Pistorius: Dr Pistorius has built up many national and international collaborations related to his Marine Apex Predator Research Unit.

Dr Lorien Pichegru: Collaboration on Magellanic penguins with Centro Pagagonico – CONICET (The National Scientific and Technical Research Council) in Argentina with Prof P. Yorio.

Ms Bernadette Snow: Engagements with researchers from Sweden, America and the United Kingdom that have developed into projects and proposed projects for 2017. She also engaged with Dr Maria Barbosa Lima Toivanen, Finland.

Dr Nelson Miranda & Dr Nasreen Peer: Visited the University of Hawa'i at Mānoa, 4-10 August 2016. These collaborations are necessary to address the gaps in scientific knowledge regarding the behavioural and chemical basis of communication in a diverse and ecologically important class of molluscs of conservation concern. Collaboration with the following researchers:

- ◆ Prof Mark G. Wright, Department of Plant and Environmental Protection Sciences
- ◆ Prof Robert H. Cowie, Pacific Biosciences Research Centre
- ◆ Dr Brenden S. Holland, Pacific Biosciences Research Centre
- ◆ Dr Joanne Y. Yew, Pacific Biosciences Research Centre
- ◆ Dr Nicholas James, John A. Burns School of Medicine
- ◆ Prof Dasuke Takagi, Department of Mathematics





Communicating Science

Popular Articles

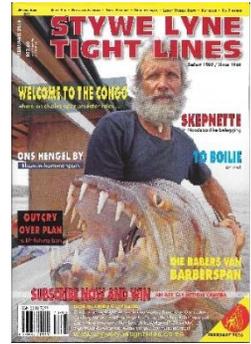
Prof Nadine Strydom wrote a popular article on the state of South Africa's fisheries and coastal angling fish stocks. This article was published in three South African magazines to communicate this research to a wider audience and as an education drive.



DIRE STRAITS – South Africa's fisheries in dire straits, published in the January/February 2016 edition of *Ski-Boat* magazine – Issue 32(1): 37-40.
http://www.africanangler.com/sb_article.asp?id=983



Taking Stock – South Africa's coastal angling fisheries are in dire straits, published in the May 2016 edition of *Leisure Boating Magazine* – p. 52-54.
<http://leisureboating.co.za/articles/past-issues/2016/may-2016/big-game-fishing-taking-stock>



DIRE STRAITS – South Africa's coastal angling fisheries in dire straits, published in the February 2016 edition of *Stywe Lyne/Tight Lines* magazine – Issue 672: 33-38.
<http://stywelynetightlines.co.za/issue.htm?issueID=98>



Gavin Rishworth, PhD Candidate, took part in an interactive workshop with science journalist, Sarah Wild, to develop science communication and public engagement skills. The popular article entitled *Stromatolites* was produced as part of Science Today: SA's Best Postgrad Science Writing 2016 (www.sceincetoday.co.za). This article can be found in *Science Today* 2016 Edition, p. 36-37.



The **Marine Spatial Planning** SARChI Chair launched a Facebook page during 2016. This forms a platform for them to constantly communicate their research on a social media platform. Other active Facebook pages related to the MSP Chair include: *Plett Hope Spot*, *Garden Route Biosphere Reserve* and *Southern African Bryde's Whale Project*

CMR Workshops

During 2016, the CMR hosted three workshops, focusing on the three broad *research themes* outlined by the Institute. Each workshop consisted of presentations by key speakers from the CMR or invited academics, and an open discussion where the focus areas were scrutinised in terms of their objectives, goals, strategies and research gaps. Key decisions and recommendations were put forward and recorded for consideration in 2017.

Living Resources & Food Security

This workshop was hosted by Dr Paul-Pierre Steyn on 22 July at *The Old Cash Store*. Prof Patrick Vrancken (SARChI: Law of the Sea), Dr Malcolm Smale (RA, Bayworld), Prof Mike Roberts (SARChI: Food Security) and Dr Ané Oosthuizen (SANParks) presented talks. The workshop focussed on the need for, and challenges associated with, multidisciplinary research required to address complex multi-sector research questions. Projects requiring a multidisciplinary approach need to be identified and proposals developed across disciplines to ensure realistic and effective research. Existing multidisciplinary research projects should be identified and involvement sought in order to learn more about these approaches.



Biodiversity & Conservation

Dr Linda Harris hosted this workshop on 29 September at *Grass Roof Restaurant*. The speakers were Dr Linda Harris (Zoology), Prof Janine Adams (Botany), Ms Millicent Makoala (DEA) and Prof Mandy Lombard (SARChI: MSP). This workshop brought members together for the first time. Members chose to conduct research in loosely arranged working groups rather than to establish formal groups, and decided on an annual meeting schedule. Research falls overwhelmingly in the Natural Sciences, although there is keen interest in interdisciplinary research. A list of priorities and needs was compiled, and these will be focused upon in coming years.



Global Change

This workshop was hosted by Dr Shaun Deyzel on 25 November at *La Cigale*. Presentations were delivered by Dr Tommy Bornman (SAEON), Prof Alan Whitfield (SAIAB), Prof David Bell (SARChI: Earth Systems) and Prof Christo Fabricius (SRU). The objective was to gather recommendations going forward in support of ongoing efforts to facilitate transdisciplinary research. The main challenges identified were the existence of differing approaches to the scientific process including the scientific tools used, lack of dialogue and platforms conducive for effective communication and conversation between social and natural scientists and poor understanding of what the common outcome and goals should be given such interactions.



2016 Published Papers

- ◆ Adams, J.B. & Human, L.R.D. 2016. Investigation into the mortality of mangroves at Lake St Lucia a World Heritage site. *South African Journal of Botany* 107: 121-128.
- ◆ Adams, J.B. 2016. Distribution and status of *Zostera capensis* in South African estuaries - a review. *South African Journal of Botany* 107: 63-73.
- ◆ Adams, J.B., Bate, C.G. & Riddin, T. 2016. Editorial: Ecology and biodiversity of South African estuaries. *South African Journal of Botany* 107: 1-5.
- ◆ Adams, J.B., van Wyk, E. & Riddin, T. 2016. First record of *Spartina alterniflora* in southern Africa indicates adaptive potential of this saline grass. *Biological Invasions* 18: 2153-2158.
- ◆ Adams, J.B., Veldkornet, D. & Tabot, P. 2016. Distribution of macrophyte species and habitats in South African estuaries. *South African Journal of Botany* 107: 5-11.
- ◆ Attwood, C.G., van Zyl, C.S., Lombard, A.T. & McCagh, C. 2016. Seasonally and spatially referenced estimates of recreational shore-angling effort, catch composition, catch rates and total catch in the Goukamma Marine Protected Area, South Africa. *African Journal of Marine Science* 38(4): 563-579. DOI: 10.2989/1814232X.2016.1256837
- ◆ Bird, M.S., Perissinotto, R., Miranda, N.A.F., Peer, N. & Raw, J.L. 2016. Stable isotope analysis of consumer food webs indicates ecosystem recovery following prolonged drought in a subtropical estuarine lake. *African Journal of Marine Science* 38 (3): 411-422.
- ◆ Bjørnstad, A., Grobbelaar, E. & Perissinotto, R. 2016. Review of *Afraustraloderes rassei* Bouyer, 2012: description of its female and a new species of *Pixodarus* Fairmaire, 1887 (*Coleoptera*, *Cerambycidae*, *Prioninae*). *ZooKeys* 558: 77-93.
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- ◆ Connan, M., Hofmeyr, G.J.G. & Pistorius, P.A. 2016. Reappraisal of the trophic ecology of African penguins using stable isotopes. *PLoS One* 11: e0159402.
- ◆ Conry, D., Pistorius, P.A., Plön, S. & Hofmeyr, G.J.G. 2016. Sexual dimorphism and geographic variation in striped dolphin (*Stenella coeruleoalba*) crania along the coast of South Africa. *Marine Mammal Science* 32: 1254-1271.
- ◆ Costalago, D., Miranda, N.A.F., Strydom, N.A. & Perissinotto, R. 2016. Using stable isotope analysis to study the diet of *Gilchristella aestuaria* larvae: preliminary insights into the foodwebs of six South African estuaries. *African Journal of Aquatic Science* 41 (4): 389-398.
- ◆ Danckwerts, D.K., McQuaid, C.D., Connan, M., Smale, M.J., Le Corre M., Humeau, L., Kaehler, S., Juhasz, C.C., Orlowski, S., Tourmetz, J. & Jaquemmet, S. 2016. Intra-annual variation in the foraging ecology of the endangered endemic Barau's Petrel (*Pterodroma baraui*) from Réunion Island, south-western Indian Ocean: insights from a multifaceted approach. *Marine Biology* 163: 18.
- ◆ Davies, H.N., Beckley, L.E., Kobryn, H.T., Lombard, A.T., Radford, B. & Heyward, A. 2016. Integrating Climate Change Resilience Features into the Incremental Refinement of an Existing Marine Park. *PLoS ONE* 11(8): e0161094. doi:10.1371/journal.pone.0161094
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- ◆ Edworthy, C. & Strydom, N.A. 2016. Habitat partitioning by juvenile fishes in a temperate estuarine nursery, South Africa. *Scientia Marina* 80 (2): 151-161.





- ◆ Fernandes, M. & Adams, J.B. 2016. Quantifying the loss and changes in estuary habitats in the Umkomazi and Mvoti estuaries, South Africa. *South African Journal of Botany* 107: 179-187.
- ◆ Gordon, N., Perissinotto, R. & Miranda, N.A.F. 2016. Micoralgal dynamics in a shallow estuarine lake: Transition from drought to wet conditions. *Limnologica* 60: 20-30.
- ◆ Grémillet, D., Péron, C., Kato, A., Amélineau, F., Ropert-Coudert, Y., Ryan, P.G. & Pichegru, L. 2016. Starving seabirds: Unprofitable foraging and its fitness consequences in Cape gannets competing with fisheries in the Benguela upwelling ecosystem. *Marine Biology* 163: 35. doi:10.1007/s00227-015-2798-2.
- ◆ Gui, D. Karczmariski, L., Yu, R.Q., Plön, S., Chen, L. Tu, Q., Cliff, G. & Wu, Y. 2016. Profiling and spatial variation analysis of persistent organic pollutants in South African delphinids. *Environmental Science and Technology* 50(7). DOI: 10.1021/acs.est.1025b06009.
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- ◆ Harris, L.R., Abrahams, K., Bezuidenhout, K., Nel, R., 2017. The relative role of intrinsic and extrinsic factors driving alongshore movement of swash-riding smooth plough shells, *Bullia rhodostoma*. *Journal of Experimental Marine Biology and Ecology* 486: 77-86.
- ◆ Human, L.D.R., Adams, J.B. & Allanson, B.R. 2016. Insights into the cause of an *Ulva lactuca* Linnaeus bloom in the Knysna Estuary. *South African Journal of Botany* 107: 55-62.
- ◆ Human, L.D.R., Snow, G.C. & Adams, J.B. 2016. Responses in a temporarily open/closed estuary to natural and artificial mouth breaching. *South African Journal of Botany* 107: 39-48.
- ◆ Jones, S., Carrasco, N.K., Perissinotto, R. & Vosloo, A. 2016. Association of the epibiont *Epistylis* sp. with a calanoid copepod in the St Lucia Estuary, South Africa. *Journal of Plankton Research*. DOI: 10.1093/plankt/fbw069.
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Academic Engagement

Prof Janine Adams

Presentation of NMMU short learning programme (in collaboration with the Department of Environmental Affairs: Oceans and Coasts): *Management of estuaries in South Africa* (Port Elizabeth, December 2016).

Organisation of National Estuary Water Quality Workshop for March 2016, with funding from the Water Research Commission (WRC).

Prof Renzo Perissinotto

Presented a JLB & MM Smith Memorial Lecture at SAIAB (Grahamstown) on 27 September 2017. Lecture title: *Extant marine stromatolites of the Eastern Cape: a window into the earliest life in Earth?*

Prof Nadine Strydom

Presented the lecture *Estuaries in Algoa Bay: ecosystems in crisis* for the Algoa Bay Hope Spot Lecture Series.

Prof Patrick Vrancken

Presented *What is humankind without the sea?* at the SANCOR Eastern Cape postgraduate student meeting held in Port Elizabeth, June 2016,

Introduction to the 1982 UN Convention on the Law of the Sea – IOI-SA Ocean Governance Training Course.

International Law and Ocean Governance NMMU Global Studies Programme.

Prof Amanda Lombard

Prof Lombard and J. Harris delivered a presentation at the debate with R. Hilborn: *South Africa's Marine Protected Area Expansion Strategy: MPAs – do we need them?* held at Two Oceans Aquarium, Cape Town. In August 2016.

Prof Ronel Nel

Hosted the Marine Biology of South Africa (BIO373) annual short learning programme. This was attended by a group of visiting students from College of St Benedict and St John's Cloud University (Minneapolis, USA). Also contributed to the development of a new qualification for an interdisciplinary programme for a *Master of Coastal and Marine Spatial Planning*.





Dr Lorien Pichegru

Organised *Algoa Bay as the Bottlenose Dolphin Capital of the World* at the Algoa Bay Yach Club in April 2016.

Initiated the *PE Dolphin Carnival* with Nelson Mandela Bay Tourism, to be launched in October 2017.

Organisation of several outreach events and public talks at Bayworld, as part of the Algoa Bay Hope Spot initiative.

Dr Greg Hofmeyr

Facilitated a training exercise at Bayworld on live cetacean stranding response, given by staff from the Department of Environmental Affairs: Oceans and Coasts.

Dr Stephanie Plön

Dr Plön initiated and helped form a Consortium for the conservation of Indian Ocean humpback dolphins *Sousa plumbea* in South African waters (SouSA project). In collaboration with Dr Will Fowlds (Amakhala Private Game Reserve), Dr Plön also presented three courses in June as part of the *Introduction to Marine Mammal Biology: Vets Go Wild* worldwide experience programme.

Dr Eckart Schumann

Presented *Tides, waves and sediments in the Bushmans Estuary* at the Sustainable Seas Trust and Estuary Care meeting on 2 June 2016 at the Kenton-on-Sea Town Hall.





Financial Matters

MR members produce their own research funding through the usual agencies under the auspices of their Departments. This drives the research that falls under the CMR. The University Council and Science Faculty provide some support funds for the Research Diving Unit.

At the end of 2016, the CMR was in a good financial position, as shown in the financial report prepared by Ms Mariam Jogee-Jamal, Director Corporate Finance, NMMU. This report only covers the two cost centres directly under the Institute.

INCOME STATEMENT OF ISTITUTE FOR COASTAL MARINE RESEARCH

ENTITY NAME: INSTITUTE FOR COASTAL MARINE RESEARCH

ENTITY LEADER: PROF J ADAMS

FACULTY: SCIENCE

COST CENTRE(S): N186, N187

INCOME STATEMENT FOR PERIOD :

Year 2016

Opening Balance	1,329,266
INCOME	652,474
Private grants restricted	576,187
Interest Received	76,287
EXPENDITURE	1,216,465
Salaries	446,395
Operating expenses	322,123
Equipment	447,947
Closing Balance	<u>765,275</u>

Name :

Rheinard van Onselen

Title :

Accountant Research and Third Stream Income

Signature :

Date :

28-03-17

Various CMR members received additional individual grants. These were as follows:

GRANT TOTAL	GRANT DETAILS	MEMBERS INVOLVED
R 300 000	Western Cape Government Estuaries Programme	Prof J Adams, Dr,S Taljaard, Dr T Riddin and Ms M Fernandes
R 970 000	Three years. NRF Competitive Grant for Unrated Researchers	Dr L Pichegru
R 2 500 000	NRF SARChI Chair	Prof R Perissinotto (SWE)
R 865 000	NRF Rated Researcher Call – Fisheries in Mangrove Estuaries	Prof N Strydom
R 1 189 200	NRF Ocean Utilisation in marine top predators at Marion Island (2015-2017)	Dr P Pistorius
R 320 000	Save our Seas Foundation (2016-2017)	Dr P Pistorius
R 300 000 – R 320 000	DST/NRF Centre of Excellence at the Percy Fitzpatrick Institute (2012-current, per annum)	Dr P Pistorius
R 200 000	Department of Environmental Affairs: Oceans and Coasts	Dr P Pistorius
R 5 000 000 R 600 000	THRIP Grant for Abalone Ranching. R5 000 000 per year (2016-2018), R600 000 allocated to NMMU	Dr P Steyn
R 1 739 760	NRF Grant – African Coelacanth Ecosystem Programme (ACEP).	Prof A Lombard, Prof A Green (UKZN, leader)
R 1 974 000	Imida Frontiers. NRF Grant - African Coelacanth Ecosystem Programme (ACEP)	Prof A Lombard, Dr S. Kerwath (DAFF, leader)
R 70 000	Dr Louis Celliers, CSIR Fund for Scientific and Technical Cooperation.	Prof A Lombard, Prof P Vrancken Dr S Taljaard
R 7,2 million	Benguela EBSA project R 250 000 for specific focal species aspect	Dr S Holness, Prof R Nel



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Dr Shaun Deyzel: 10, 20
Ski-Boat Magazine: 32
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