NELSON MANDELA UNIVERSITY



Institute for Coastal and Marine Research (CMR)

Report 2018





CONTENTS

List of Abbreviations

Messages from the Directors

CMR Overview

Historical Background Pillars Objectives & Strategies Goals & Targets Activities Governance Structures Summary of Outputs

Research Structures

Research Themes Marine Apex Predator Research Unit (MAPRU) Research Diving Unit (RDU) Research Chairs

Highlights & Achievements

Nelson Mandela University Researcher of the Year Nelson Mandela University Awards Rated Researchers Ocean Sciences Campus

Communicating Research

Academic Publications Popular Articles & Mixed Media

Engagement

Academic Engagement Community Engagement International Collaborations & Visits

Project & Funding Output

Financial Statement

Acknowledgements

Contact Details





LIST OF ABBREVIATIONS

ASCLME	-	Agulhas and Somali Current Large Marine Ecosystems
BCC	-	Benguela Current Convention
BCLME	-	Benguela Current Large Marine Ecosystem
BCRE	-	Bayworld Centre for Research and Education
CICLICO	-	Cities and Climate Change in Coastal Western Indian Ocean
CONICET	-	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
DEDEA	-	Department of Economic Development, Environmental Affairs and Tourism
DoE	-	Department of Education
DST	-	Department of Science and Technology
EBSA	-	Ecologically or Biologically Significant Marine Areas
GCRF	-	Global Challenges Research Fund
GIZ	-	German Development Corporation
IBSS	-	International Bibliography of the Social Sciences
ICEMASA	-	International Centre for Education, Marine and Atmospheric Sciences over Africa
ILOSA	-	International Library for Ocean Sciences and Education in Africa
INTPART	-	International Partnerships for Excellent Education and Research
IORA	-	Indian Ocean Rim Association
IRD	-	French National Institute for Research Development
ISI	-	International Scientific Indexing
MoU/MoA	-	Memorandum of Understanding/Agreement
NMB	-	Nelson Mandela Bay
NOC	-	National Oceanography Centre
NRF	-	National Research Foundation
RCUK	-	Research Councils United Kingdom
SAASTA	-	South African Agency for Science and Technology
SAEON	-	South African Environmental Observation Network
SAIAB	-	South African Institute for Aquatic Biodiversity
SAIIA	-	South African Institute of International Affairs
SAIMI	-	South African International Maritime Institute
SANBI	-	South African National Biodiversity Institute
SANCCOB	-	Southern African Foundation for the Conservation of Coastal Birds
SANCOR	-	South African Network for Coastal and Oceanic Research
SANParks	-	South African National Parks
SARChI	-	South African Research Chair Initiative
SASUF	-	South Africa-Sweden University Forum
SMCRI	-	Shallow Marine and Coastal Research Infrastructure
SME	-	Small and Medium-Sized Enterprises
SST	-	Sustainable Seas Trust
STINT	-	Swedish Foundation for International Cooperation in Research and Higher Education
USAID	-	United States Agency for International Development
WESSA	-	Wildlife and Environment Society of South Africa
WIO	-	Western Indian Ocean
WIOMSA	-	Western Indian Ocean Marine Science Association
WRC	-	Water Research Commission
WWF	-	World Wildlife Fund
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MESSAGES FROM THE DIRECTORS

2018 whooshed by in a happy blur. I felt honoured to be acting as Director for the CMR while Professor Janine Adams was on sabbatical. It was a busy year of exciting seminars, engagements and research.

There are many moments that stand out, but my personal highlight was having Professors Bruce Robertson, Guy Bate and Anton McLachlan attend the CMR's annual Research Symposium. Their support is priceless and valued, since they helped shape and mould the CMR through different iterations to where it is today – the largest University-wide research entity, with a membership that exceeds 200.

Another bright moment was engaging with the members of CMR. Without their support and input, we would not succeed. This report provides the very opportunity to celebrate achievements and to thank every member for their contributions.

I reflected on why I believe in the work CMR undertakes and contributions made to society. For me, it is the high standard of academia, the multiple disciplines that can tackle problems from different viewpoints, and the postgraduate students. It is therefore the ever-growing diversity, which makes CMR what it is today. Thank you for the contributions you made in 2018!

Berny Snow CMR Acting Director 2018



I served as Acting Deputy Director in 2018 and it was a wonderful experience working with Berny and Liza. It was an important in Nelson Mandela University's vear trajectory towards becoming an important hub for marine sciences as the unfolding of an ambitious vision was taking place. Following its launch in September 2017, the new home for the CMR at the Ocean Sciences Campus became a hive of activity, hosting numerous national and international meetings and workshops. CMR hosted its 2nd annual Research Symposium, which I think deserves special mention. The North Campus Conference Theatre was filled to near capacity, demonstrating the wide interest in marine sciences at our University. The Symposium gave our Research Associates an opportunity to share their research, and it showcased the large pool of active RA's associated with the CMR. These colleagues are playing a very important role in building a strong research portfolio in the marine sciences at Nelson Mandela University. The year's activities gave me great confidence in a bright future for marine sciences and in our ability to address some of the conservation and socio-economic challenges faced on our continent. The growing interdisciplinary nature of much of the CMR's research is critical in this regard, and is likely to underscore our future successes.

Pierre Pistorius CMR Acting Deputy Director 2018



CMR OVERVIEW

Historical Background

Pillars

Objectives & Strategies

Goals & Targets

Activities

Governance Structures

The tradition of coastal and marine research at the Nelson Mandela University dates back to the University of Port Elizabeth (UPE) in the early 1970s. This grew from a few postgraduate students to staff from several disciplines by the early 1980s. The Institute for Coastal and Marine Research (CMR) was first initiated as the Institute for Coastal Research (ICR) at UPE in 1983. Collaborative interdisciplinary research on the coast and ocean is therefore already nearly four decades old at the University. Starting as a forum to promote collaboration among three academic Departments (Botany; Zoology; Earth Sciences), the ICR expanded its suite of activities in the 1980s 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. The most notable was a major grant from South African Breweries (SAB), which underwrote ICR activities into the 1990s.

The Institute underwent a series of transformations until 2007, changing name to the SAB Institute for Coastal Resource Management in 1997, and then to the SAB Institute for Environmental and Coastal Management (IECM) in 2002. The focus was mainly on commercial contracts for environmental consulting. It then operated as a Unit under the Faculty of Science until the University's strategic decision in 2013 to develop a strong marine and maritime Institutional Theme. This was expounded as the University's signature tune in the Maritime and Marine Sciences Strategy written 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 the University must play a role in addressing this challenge.

Initially defined as an entity within the Faculty of Science, the CMR was elevated to a University-wide Institute in 2016, reporting directly to the Deputy Vice-Chancellor: Research & Engagement (now Research, Innovation & Internationalisation). This gave the CMR the power to become the facilitator for the development of transdisciplinary ocean and coastal sciences research projects. The appointment of a part-time Director at the start of 2016 contributed to starting Institute activities, including reaching out to other University Faculties and entities in addition to Science. The Institute now spans across all seven Nelson Mandela University Faculties and includes members from over 20 internal and over 30 external research entities. With its position at the Ocean Sciences Campus, the CMR will play a vital role in supporting the University's drive for excellence in ocean and coastal research.



Pillars

VISION

CMR aims to be a leading ocean and coastal 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 Nelson Mandela University 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 Nelson Mandela University values, 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 disadvantaged backgrounds to promote respect for diversity.
- Emphasis on excellence in all aspects of research, training, and outreach.





Objectives & Strategies

OBJECTIVES

- 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 in 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 and international) and other activities of wide interest to showcase expertise and achievements.
- Be the first point of contact for marine issues at the Nelson Mandela University and communicate, on behalf of the membership, with the external community and top management.

STRATEGIES

- Enhance the breadth of CMR collaboration and range of coastal and marine expertise across the University and externally.
- Increase funding for research, studentships and resources to promote research and training.
- Strengthen branding and marketing to maintain a high profile nationally and internationally.
- Build, grow, and develop expertise and fill gaps in critical areas to build capacity and broaden expertise.
- Develop, maintain, and expand infrastructure at the Ocean Sciences Campus and across Campuses to strengthen marine research and capacity.



Goals & Targets

Identify a full-time Director for the Institute

The Director and Deputy Director positions remained part-time, voluntary positions. The Directorship position needed to be reviewed at the end of 2018 and after advertising this post, Dr Bernadette Snow was appointed as CMR Director for the term 1 January 2019 – 31 December 2021. Professor Pierre Pistorius, Acting Deputy Director for 2018, stepped down from his position to enjoy a research sabbatical for 2019 and Professor Janine Adams was appointed as the Deputy Director.

Meet with the Advisory Board twice a year, and with the Management Committee four times a year

The number of Advisory Board meetings intended, was held. The Management Committee was kept well informed of CMR activities through regular e-mail updates and smaller meetings with certain Management Committee members over specific issues. It was therefore deemed unnecessary to comply to the four meetings initially envisaged. Three standard Management Committee meetings were held, with an extraordinary Management Committee meeting taking place.

Launch the CMR as a University-wide entity outside the Faculty of Science

2018 was the second full year during which the CMR Management reported to the DVC: Research, Innovation & Internationalisation. Through the CMR's planned events, and participating in activities coordinated by other parties, the CMR's membership increased substantially and all seven Faculties were represented within the CMR during 2018. The CMR moved its offices to the Ocean Sciences Campus during March 2018 and this provided numerous opportunities to further establish itself as a University-wide entity facilitating transdisciplinary research in the ocean and coastal environment.

Run research diver training courses through the Research Diving Unit The RDU conducted two courses during 2018.

Continue research and postgraduate training on coastal and marine issues

A total of 105 postgraduate students were supervised by CMR members. CMR members published 72 articles in high quality, peer-reviewed internationally recognised journals.

Host a number of programmes to showcase ocean and coastal research

The CMR hosted and participated in a number of events during 2018. Details on these are captured throughout various sections of this report.

Make use of opportunities under Operation Phakisa This is a continuous process in collaboration with research partners within the University, particularly those based at the Ocean Sciences Campus, and those connected to external research entities. Professor Patrick Vrancken is the Chairperson of the Skills Working Group for Ocean Governance and the Marine Protected Services. Professor Mandy Lombard and Professor Vrancken are involved in the development of the marine spatial bill. The Community of Practice project towards developing a marine spatial plan for Algoa Bay is in response to Operation Phakisa: Growing the Blue Economy in a responsible manner.





The Nelson Mandela University is an engaged and people-centred institution that serves the needs of its diverse communities by contributing to sustainable development through excellent academic programmes, research, and service delivery. The University vision is to be values-driven, optimising the potential of our communities towards sustainable development in Africa. The CMR aims to perform in such a way that its activities form an integral part in assisting the University in achieving its goals. A wide range of activities fall under the scope of the Institute, and can be broadly classified as **Research**, **Training**, and **Consulting**. These may overlap.

RESEARCH

Research, particularly transdisciplinary research in the ocean and coastal field, is the CMR's primary activity and it forms the core on which other activities are based. Members address fundamental and applied problems through research. This is grouped under three broad thematic areas, detailed under *Research Structures* in this report.

TRAINING

Members provide research-based training through Masters and Doctoral programmes, based in participating academic University Departments. The Institute offers short courses to train divers and can offer courses on other topics on demand. Programmes with an interdisciplinary nature are encouraged.

CONSULTING

The CMR embraces a broad and unique spectrum of expertise relevant to coastal and marine issues through its members, who are drawn from varied disciplines. This pool of expertise is the broadest in the region, and is used to provide community service in the form of commercial consultancies on issues in the coastal zone and marine environment.



Governance Structures



The Director, assisted by the Deputy Director, provides overall vision and leadership to the Institute, and assumes responsibility for all activities. During 2018, both positions were voluntary, non-remunerated positions. The assisted by a Management Director is Committee, representative wider of а membership who guides the running of the The Director, on behalf of CMR. the Management Committee, reports to the DVC: Research, Innovation & Internationalisation. The DVC Chairs an Advisory Board, which includes external stakeholders. The Advisory Board advises on the overall vision, direction and strategy for the Institute. This panel also screens CMR annual research reports before submission to Council and Senate.

CMR leadership and staffing changed at the beginning of 2018. Professor Janine Adams was the CMR Director for the full year of 2017, with Dr Bernadette Snow appointed as the Deputy Director for the same period. Professor Adams enjoyed a 12-month research sabbatical during 2018 and Dr Snow fulfilled the role of Acting Director. Professor Pierre Pistorius was appointed as the Acting Deputy Director for 2018. Two Units exist under the CMR: Marine Apex Predator Research Unit (MAPRU) and the Research Diving Unit (RDU). Professor Pierre Pistorius and Mr Anton Cloete remained the Managers of these Units, respectively. Mrs Liza Rishworth continued in her position as Research Assistant for the CMR, providing overall support to the CMR and its research partners. Ms Oyama Mkaza was appointed as a part-time Administrative Assistant to assist with growing CMR needs. The end of 2018 saw the end of the first threeyear period of increased CMR activities after being placed under the DVC's portfolio, and membership on the Management Committee and Advisory Board therefore needed revision. This was discussed at the last CMR Advisory Board meeting for 2018, and would be actioned early in 2019.



MEMBERS	ADVISORY BOARD	MANAGEMENT COMMITTEE
DVC: Research, Innovation & Internationalisation	Chair	
CMR Director	Х	Х
CMR Acting Director	Х	Chair
CMR Acting Deputy Director	Х	Х
Director of School: Environmental Sciences	Х	Х
Research Theme Coordinators	Х	Х
Dean: Faculty of Science	Х	
Dean: Faculty of Arts	Х	
Dean: Faculty of EBEIT	Х	
Representative: Faculty of Science		Х
Representative: Faculty of Business and Economic Sciences		Х
Representative: DEA Oceans & Coasts	Х	
Representative: NRF	Х	
Regional Director: ASCLME	х	
Representative: SAEON	Х	Х
Representative: SAIAB	х	
Representative: BCRE	Х	Х
Representative: NMB Metro	Х	
Representative: DAFF	Х	
Representative: National Ports Authority	Х	
Manager: MAPRU		Х
Manager: RDU		Х
Student Representative: Post-Doctoral Fellows	Х	х
Student Representative: Masters & Doctoral Candidates	Х	X

The CMR panels were constituted as follows during 2018:



Two Advisory Board meetings were held during 2018: 5 April and 27 November. Three ordinary Management Committee meetings were held on 27 March, 17 August and 21 November. Much effort was put into developing a succession plan for the RDU to ensure future sustainability and viability. A number of meetings were held to determine the role of the RDU in light of Ocean Sciences Campus collaborations and the way forward, with a specific Extraordinary Management Committee meeting held on 17 May. The CMR Office called a number of additional meetings with relevant stakeholders throughout the year, as specific matters of interest or urgency arose.





CMR Membership Categories are as follows:

Academic and Staff Members

University staff employed within departments.

Research Associates, Professional Associates, and Research Fellows

Researchers and professionals that are formally affiliated with the University. Associate Members

Colleagues from external entities, but that are involved in CMR research activities.

Support Members

Staff that provide logistic and administrative support to various University groups and strategies.

News Members

University members not involved in marine research, past students, and members of the public who wish to receive updates on CMR activities.



Summary of Outputs



CMR members enjoyed a very successful year. The graphs below indicate CMR growth from 2015 to 2018.





■ 2015 ■ 2016 ■ 2017 ■ 2018

Outputs



Student Categories



Student Race and Gender Demographics



RESEARCH STRUCTURES

Research Themes

Marine Apex Predator Research Unit (MAPRU)

VIEL VAL PALADA

Research Diving Unit (RDU)

Chairs

Research Themes

The focus of the CMR resides within the Ocean and Coastal Sciences Theme of the University, and it contributes to the developing Ocean Sciences Strategy. Research within the CMR takes place in three broad Research Themes, discussed below.

LIVING RESOURCES AND MARINE FOOD SECURITY

This covers projects studying and developing coastal and marine living resources which are, or can be, utilised as food sources. Emphasis is on **sustainability**. This CMR Research Theme cuts into the Institutional *Health and Sustainable Livelihoods* research theme. <u>Coordinator: Dr Paul-Pierre Steyn (Department of Botany)</u>

BIODIVERSITY, CONSERVATION AND MANAGEMENT

This includes projects broadly relating to **understanding**, **protecting and managing** coastal and marine ecosystems – both for conservation and sustainable human use. The amendment of this Research Theme to include *Management* in the title was approved by the Management Committee at the 21 November 2018 meeting, and makes this Research Theme more inclusive of a wider field of research.

Coordinator: Dr Linda Harris (Department of Zoology)

GLOBAL CHANGE

Projects under this Research Theme are aimed at monitoring and understanding change, both **anthropogenic and natural**, and how that change affects coastal and marine systems and human communities dependent on them. <u>Coordinator: Dr Shaun Deyzel (SAEON)</u>

There was consensus during 2018 that each Research Theme does not need a specific coordinator. Instead, the CMR will allocate projects under these Research Themes and make contact details for principal investigators available to answer questions or to provide information.



Marine Apex Predator Research Unit (MAPRU)

The Marine Apex Predator Research Unit (MAPRU) is a research Unit within the CMR. It was established in 2016 and is managed by Professor Pierre Pistorius.

OBJECTIVES

- Conduct research on marine top predators, including seabirds, seals, sharks and 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.

RESEARCH FOCUS

MAPRU focuses research activities on marine top predators as a group, addressing questions of fundamental and applied interest by drawing on a range of disciplines. Many marine top predator species are threatened and research undertaken has a strong conservation focus. At the upper limit of the food chain, marine top predators are generally good indicators of global change as well as areas of high productivity. Marine top predators, at the species and community level, are therefore also used to better understand ecosystem changes and for conservation-based spatial planning.







GEOGRAPHICAL REACH

Most of MAPRU's projects are focussed on the South African coastline and in the sub-Antarctic region, but also extend into Mozambique and Namibia. The majority of MAPRU members are based at the Nelson Mandela University, but a number are hosted by other collaborating institutions. Strong links are maintained with national and international research partners.

MEMBERSHIP & OUTPUS

Senior membership for 2018, excluding postgraduate students, was as follows:

- Professor Pierre Pistorius: Manager
- Dr Lorien Pichegru: Research Fellow
- Dr Malcolm Smale: Research Associate
- Dr Maëlle Connan: Research Fellow
- Dr Greg Hofmeyr: Research Associate
- Professor Theagarten Lingham-Soliar: Research Fellow

Postgraduate students for 2018 constituted the following:

	<u>Registered</u>	<u>Graduated</u>
<u>Masters</u>	7	2
Doctoral	8	1
Post-Doctoral	4	

MAPRU members published a total of 29 articles in high quality, peer reviewed journals during 2018.



Research Diving Unit (RDU)







The Research Diving Unit (RDU) is housed within the CMR and supports marine research and related academic programmes. This includes consulting contracts registered with the University by providing access to diver training, equipment, logistical support, and expertise. The RDU was managed by Mr Anton Cloete during 2018.

MANDATE

- Provide operational support to research projects and contracts.
- Provide and develop commercial diving capacity within the Nelson Mandela University through providing training, qualifications and experience.
- Provide Safety, Health, Environmental and Quality Assurance in all its training, personnel, operations and equipment, as enforced by legislation. This includes ensuring copies of permits issued to researchers are available at the dive site, as required by legislation.

PERSONNELL & LEGAL ISSUES

Contract personnel are appointed as required, and this may include supervisors, skippers, divers, and vessel crew. This is an important legal structure which ensures captured within employees are the University's Occupational Health & Safety framework as employees for remuneration Injury on Duty purposes. For and Occupational Health and Safety compliance, the RDU reports directly to the Nelson Mandela University Health & Safety Officer.

DIVING OPERATIONS

A total of 90 diving operations were conducted during 2018, resulting in a total of 623 incident-free man-hours. Various research projects and Service Level Agreements (SLAs) fell under Memorandum of Understanding (MoU) signed between the University and parties requiring diving support.



TRAINING

The RDU offered two Class V diver training courses during 2018. A total of seven scientific divers were added to the diving group to service marine projects.

SUPPORT

The Emergency Medical Care Department was assisted again with the provision of practical crew training for the 2nd and 3rd year Paramedic students and their water rescue module. The RDU was supported for a third year by an external medical emergency provider. The RDU supported the research programme undertaken by Plymouth University at the Sundays River Beach, as well as the Turtle Research Programme. The Departments of Botany and Zoology were also assisted with student work and maintenance to equipment and systems.

OCEAN SCIENCES CAMPUS

All RDU operations were relocated to the Ocean Sciences Campus at the beginning of 2018. Various groups, both internal University groups and external partners, are involved in intensive diving operations at this Campus. It will provide many collaboration opportunities, and the RDU can play a significant role in the consolidation of Ocean Sciences diving.



Four Research Chairs form part of the CMR. These Chairs play a significant role in creating research expertise in specific fields and they are an important contributor to the development of early career researchers. Only postgraduate students are involved in Chair activities.

SARChI: SHALLOW WATER ECOSYSTEMS Interim Chair Holder: Professor Janine Adams

Water is a scare 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 ecosystems and their health. Research focus is on:

- Conservation and management of estuaries.
- Blue carbon ecosystems and responses to climate change.
- Water quality, eutrophication and harmful algal blooms.

Professor Renzo Perissinotto was the Chair Holder for this group from 2013 until his retirement in June 2018.



SARCHI: LAW OF THE SEA AND DEVELOPMENT IN AFRICA Chair Holder: Professor Patrick Vrancken

Research undertaken by this Chair focuses on the following three areas:

- South Africa and the law of the sea, including the legal regime governing the South African continental shelf and the exploitation of its resources.
- Development in Africa and the law of the sea, including relevant indigenous law.
- The legal aspects of marine tourism.

Professor Vrancken is the Chairperson of the Skills Working Group for Ocean Governance and the Marine Protection Services. He is also heavily involved in the development of the marine spatial bill.





SARCHI: MARINE SPATIAL PLANNING Chair Holder: Professor Mandy Lombard

Extractive ocean uses need to be managed more sensibly, ensuring that healthy ocean ecosystems are maintained. It is of critical importance that young professionals are equipped to deal with the science, policy, and socio-economic aspects of managing ocean use. To achieve this, transparency in research is a necessity. This Chair, along with Professor Rosemary Dorrington's SARChI Chair in Marine Natural Products at Rhodes University, runs the Algoa Bay Project. This Project works with stakeholders to build a dynamic Systems Model to explore different marine spatial planning options for Algoa Bay. The CMR is the administrative home for this Algoa Bay Community of Practice (CoP) Project. Professor Lombard also has a very active research team in the Plettenberg Bay area.



UK-SA Bilateral Research Chair: Ocean Science & Marine Food Security Chair Holder: Professor Michael Roberts

This UK-SA Bilateral Research Chair between the Nelson Mandela University and the University of Southampton (United Kingdom) aims to develop a regional research and training capacity in ocean sciences based at the Nelson Mandela University. This capacity will be used to undertake marine research in support of food security in the Western Indian Ocean (WIO). The research plan recognises nine upwelling regions in the WIO which sustain ecosystems and resources. This region has very limited scientific, institutional and ocean governance capacity to address the challenges of overexploitation, habitat destruction, and a changing Indian Ocean that threaten ecosystem health and livelihoods. An *Innovation Bridge* is being built between the Nelson Mandela University and the National Oceanography Centre (UK), enabling immediate access to marine robotics, satellite observations, biogeochemistry, and modelling. Our University houses research staff and postgraduate work space, ocean engineering workshops, a diving unit, laboratories, instruments and aquaria for ocean production experiments.



HIGHLIGHTS & ACHIEVEMENTS



Nelson Mandela University Awards

Rated Researchers

Ocean Sciences Campus

Nelson Mandela University Researcher of the Year

A LETTER FROM PROFESSOR PIERRE PISTORIUS



It is a strange thing that certain events in one's life can so drastically influence things to come. When students discuss their career ambitions with me I always reflect on the day at the University of Pretoria, while engaged in a BSc Honours degree in Entomology studying dung beetles, when I was offered an adventurous opportunity to go to Marion Island for a year. The kicker was that I had to change disciplines and move up several trophic levels to do a MSc on the demographics of southern Elephant seals. And so started my obsession with islands and marine predators that subsequent to my

PhD took me to various countries and islands, including Aldabra in the Seychelles and the Falkland Islands, where I was contracted to run research programmes involving various seabirds and marine mammals.

I left the Falkland Islands to take up a position as Senior Lecturer in the Department of Zoology at the then Nelson Mandela Metropolitan University in October 2009. I continued some of the research I was involved with at the Falkland Islands, with involvement of postgraduate students, and revitalised my sub-Antarctic research at Marion Island and initiated several local projects on marine predators. The overarching objectives of this research has at least partly been to better understand and manage populations of marine predators that are particularly vulnerable to global change and to use various behavioural and demographic aspects of study populations to detect changes in marine ecosystems. Being at the upper end of the food chain, these predators integrate changes occurring at the lower trophic levels and offer the opportunity to detect and better understand ecosystem changes. A further advantage of studying charismatic species such as penguins, dolphins, seals and sharks, is that they hold great interest in the public eye. Very few images have brought the reality of climate change home as hard as those of polar bears on broken ice sheets in the Arctic.





Although my research spans various disciplines and has broad geographic coverage, my research on Marion Island currently receives notable attention. In 2015 I received a grant through the NRF's South African National Antarctic Program (SANAP) to run a large multispecies tracking and trophic project involving 12 species of sub-Antarctic seabirds and seals. This project is ongoing and every year two students or field assistants spend a year on the remote island collecting data on various aspects of these study species. Marine top predators target productive regions in the vast Southern Ocean while foraging, and a primary objective is to use tracking data (obtained through deployments of tracking instruments on study animals) from multiple species to identify areas of Ecologically or Biologically Significant Areas that can guide marine spatial planning in the region. As it is difficult to obtain samples or information on lower trophic level species such as krill and squid (due to logistics and expenses associated with ship-time at the Southern latitudes), we also use these predators as samplers of these lower trophic levels through dietary studies to better understand climate influences throughout the ecosystem. An integration of the physical attributes of the Southern Ocean is clearly fundamental to this work and requires close collaboration with oceanographers.

As part of the above-mentioned SANAP project, I spent a 6-month research sabbatical at the Institute for Marine and Antarctic Studies in Hobart in 2015, working with one of my key collaborators on the project. After a stimulating period away, I returned enthused and motivated and established the Marine Apex Predator Research Unit (MAPRU) within the CMR, which I have been heading since. MAPRU has gained significant traction since then and has become known as an important hub for marine predator research in South Africa. Currently the unit has a membership of seven senior scientists, four post-doctoral candidates and 12 postgraduate students. Over the past few years, the unit has averaged about 30 peer-reviewed scientific articles annually, generally in high impact international journals, and has maintained a strong record of popularising these findings through various media outlets and public presentations.

With Algoa Bay at its doorstep, Nelson Mandela University is well poised to further grow its reputation as a stronghold for ecological studies involving marine predators. With the largest gannetry in the world, the largest African penguin colony and potentially one of the largest Bottlenose dolphin populations, together with the eastern-most colony of Cape fur seals and abundant shark life, the potential for good research, community engagement and student training is truly exceptional.



Nelson Mandela University Awards



Professor Pierre Pistorius received the University Researcher of the Year Award

Professor Janine Adams received the Science Faculty Researcher of the Year Award





Professor Patrick Vrancken received the Research Excellence Award

Ms Tanya Wagenaar received the Law Faculty Excellent Teacher of the Year Award





Rated Researchers

The researcher 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. The rating system encourages excellent 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 & Coastal Systems; Plant Ecophysiology
Boswell R, Prof.	C1	Arts	Cultural Diversity; Social Justice
Connan M, Prof.	C3	Science	Marine Ecology; Stable Isotopes; Genetics
Cowling RM, Prof.	A1	Science	Evolutionary Ecology; Palaeobotany; Conservation
Hattingh DG, Prof.	B3	EBEIT	Friction Processing; Manufacturing Technologies
Leitch AWR, Prof.	C3	Science	Physics
Lombard AT, Prof.	C1	Science	Systematic Conservation Planning; Animal Welfare
Neethling JH, Prof.	B1	Science	High Resolution Transmission Electron Microscopy
Nel P, Prof.	C2	Science	Coastal Ecology & Conservation; Sea Turtle Research
Perissinotto R, Prof.	B2	Science	Aquatic Ecology; Invertebrate Biodiversity
Pichegru L, Dr	C2	Science	Seabird Ecology; Spatial Ecology; Education
Pistorius PA, Prof.	C1	Science	Marine Apex Predators; Population Ecology; Global Change
Potts A, Dr	Y1	Science	Coastal Palaeoscience; Genetics
Scholtz BM, Prof.	C3	Science	Data Analytics; Business Intelligence
Shakantu W, Prof.	C3	EBEIT	Building Economics; Construction Industry
Strydom NA, Prof.	C2	Science	Estuarine Ichthyology; Plankton Ecology
Vrancken PHG, Prof.	C1	Law	Maritime Law; Tourism Law & Legislation

Ocean Sciences Campus

The Nelson Mandela University arranged an extravagant celebration to launch the Ocean Sciences Campus on 22 September 2017. This Campus focuses on transdisciplinary research and engagement, and the CMR plays a critical role in facilitating this and achieving the goals set out in the University's Ocean Sciences Strategy. To ensure transdisciplinary collaboration, this Campus hosts University Faculties and groups, as well as external stakeholders.

University groups based at this Campus include:

- Faculty of Science
- Faculty of Law
- Faculty of Business and Economic Sciences
- SARChI Shallow Water Ecosystems
- SARChI Marine Spatial Planning
- SARChI Law of the Sea and Development in Africa
- UK-SA Bilateral Research Chair in Ocean Science and Marine Food Security
- FishFORCE

External research and stakeholder divisions hosted at the Ocean Sciences Campus include:

- SEAON Elwandle Node (South African Environmental Observation Network)
- SAIAB (South African Institute for Aquatic Biodiversity)
- SAIMI (South African International Maritime Institute)

The CMR and RDU relocated all of their operations from South Campus to the Ocean Sciences Campus during March 2018.



COMMUNICATING RESEARCH

Academic Publications

Popular Articles & Mixed Media

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Academic Publications

The CMR enjoyed a very successful year during 2018 in terms of outputs. A total of 72 ISI, IBSS and DOE articles related to ocean and coastal marine research were published, as well as one book, six book chapters and six research reports. At least 30 conference presentations were delivered at 14 international conferences, and at least 15 presentations were delivered at eight national conferences attended by members of the CMR. A minimum of fifteen workshops were also attended and presented at.

Below is a list of the **marine-related**, **transdisciplinary journal articles** published by CMR members during 2018:

Barendse J, Basson J, Petersen SL & Sink K. 2018. The sustainable seafood movement viewed as a maturing social-ecological issue using a South African case-study. *Ocean and Coastal Management* **151**: 178-192.

Bate GC, Mkhwanazi M & Simonis J. 2018. Blackwater in South African estuaries with emphasis on Mgobezeleni Estuary in northern KwaZulu-Natal. *Transactions of the Royal Society of South Africa* **73**(2): 133-142.

Bornman E, Strydom NA & Clemmesen C. 2018. Appraisal of warm-temperate South African mangrove estuaries as habitats to enhance larval nutritional condition and growth of *Gilchristella aestuaria* (Family Clupeidae) using RNA:DNA ratios. *Estuaries and Coasts* **41**(5): 1463-1474.

Botha JA & Pistorius PA. 2018. Variability in the foraging distribution and diet of Cape gannets between the guard and post-guard phases of the breeding cycle. *Frontiers in Marine Science* **5**: 15.

Bouveroux T, Caputo M, Froneman W & Plön S. 2018. Largest reported groups for the Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) found in Algoa Bay, South Africa: trends and potential drivers. *Marine Mammal Science* **34**(3): 645-665.

Bouveroux T, Melly B, McGregor G & Plön S. 2018. Another dolphin in peril? Photo-identification, occurrence and size of the Indian Ocean humpback dolphin (*Sousa plumbea*) in Algoa Bay, South Africa. Aquatic Conservation: Marine and Freshwater Ecosystems **28**: 723-732.

Connan M, Bonnevie B & McQuad C. 2018. Ontogeny, tissue and species but not sex influence stable isotopic values of three albatross species. *Polar Biology* **41**: 1175-1186.

Constantine R, Iwata T, Nieukirk SL & Penry GS. 2018. Future Directions on Bryde's Whales. *Frontiers in Marine Science* **5**: 333.

Costalago D, Potter P, Pattrick P & Strydom NA. 2018. Influence of environmental variables on the larval stages of anchovy *Engraulis encrasicolus*, and sardine *Sardinops sagax*, in Algoa Bay, South Africa. *Environmental Biology of Fishes* **101**: 225-236.

Cristofari R, Liu X, Bonadonna F, Cherel Y, Pistorius P, Le Maho Y, Raybaud V, Stenseth NC, Le Bohec C & Trucchi E. 2018. Climate-driven range shifts in fragmented ecosystems. *Nature Climate Change* **8**: 245-251.





Dalu T, Adams JB, Taylor JC, Bate G, Nunes M, Froneman W & Wasserman RJ. 2018. An overview of the ecology and status of estuarine microphytobenthos research in South Africa. *African Journal of Marine Science* **40**: 1-12.

Dalu T, Magoro ML, Tonkin JD, Huma LRD, Perissinotto R, Deyzel SHP, Adams JB & Whitfield AK. 2018. Assessing phytoplankton composition and structure within micro-estuaries and micro-outlets: a community analysis approach. *Hydrobiologia* **818**: 177-191.

Daly R, MJ Smale, Singh S, Anders D, Shivji M, Daly CAK, Lea JSE, Sousea LL, Wheterbee BM, Fitzpatrick R, Clarrke CR, Sheaves M & Barnett A. 2018. Refuges and risks: Evaluating the benefits of an expanded MPA network for mobile marine predators. *Diversity and Distributions* **24**(3): 1-14.

Dicken ML, Winker H, Smale MJ & Cliff G. 2018. Sharks caught in the KwaZulu-Natal bather protection programme, South Africa. 14. The Smooth hammerhead Sphyrna zygaena (Linnaeus). *African Journal of Marine Science* **40**(2): 157-174.

Dodd C, Anderson CR, Perissinotto R, Du Plooy S & Rishworth GM. 2018. Hydrochemistry of peritidal stromatolite pools and associated freshwater inlets along the Eastern Cape coast, South Africa. *Sedimentary Geology* **373**: 163-179.

Dorrington R, Lombard AT, Bornman T, Adams JB, Cawthra HC, Deyzel SHP, Goschen WS, Liu K, Mahler-Coetzee J, Matcher GF, McQuaid C, Parker-Nance S, Paterson A, Perissinotto R, Porri F, Roberts M, Snow B & Vrancken P. 2018. Working together for our oceans: a marine spatial plan for Algoa Bay, South Africa. *South African Journal of Science* **114**(3/4): 18-23.

Du Plooy SJ, Anandraj A, White S, Perissinotto R & Du Preez DR. 2018. Robust photosystem I activity by *Cyanothece* sp. (Cyanobacteria) and its role in prolonged bloom persistence in Lake St Lucia, South Africa. *Extremophiles* **22**(4): 639-650.

Du Plooy SJ, Perissinotto R & Muir DG. 2018. Hypo-osmotic shock and the role of freshwater input on the post-bloom recovery of Cyanothece sp. in Lake St Lucia, South Africa. *Marine Biology Research* **14**: 87-94.

Du Preez M, Nel R & Bouwman H. 2018. First report of metallic elements in loggerhead and leatherback turtle eggs from the Indian Ocean. *Chemosphere* **197**: 716-728.

Frugone MJ, Lowther A, Noll D, Ramos B, Pistorius PA, Dantas GPM, Petry MV, Bonadonna F, Steinfurth A, Polanowski A, Raya RA, Lois NA, Pütz K, Trathan P, Wienecke B, Poulin E & Vianna JA. 2018. Contrasting phylogeographic pattern among Eudyptes penguins around the Southern Ocean. *Scientific Reports* **8**: 17481.



Handley JM, Thiebault A, Stanworth A, Schutt D & Pistorius P. 2018. Behaviourally mediated predation avoidance in penguin prey: in situ evidence from animal-borne camera loggers. *Royal Society Open Science* **5**: 171449.

Harris LR, Nel R, Oosthuizen H, Meyer M, Kotze D, Anders D, McCue S & Bachoo S. 2018. Managing conflicts between economic activities and threatened migratory marine species toward creating a multiobjective blue economy. *Conservation Biology* **32**: 411-423.

Human LRD, Magoro ML, Dalu T, Perissinotto R, Whitfield AK, Adams JB, Deyzel SHP & Rishworth GM. 2018. Natural nutrient enrichment and algal responses in near pristine micro-estuaries and micro-outlets. *Science of the Total Environment* **624**: 945-954.

James NC, Cowley PD & Whitfield AK. 2018. The marine fish assemblage of the East Kleinemonde Estuary over 20 years: Declining abundance and nursery function? *Estuarine, Coastal and Shelf Science* **214**: 64-71.

Jones S, Carrasco NK, Vosloo A & Perissinotto R. 2018. Impacts of turbidity on an epibiotic ciliate in the St Lucia Estuary, South Africa. *Hydrobiologia* **815**: 37-46.

Kersalé M, Lamont T, Speich S, Terre T, Laxenaire R, Roberts MJ, Van Den Berg MA & Ansorge AJ. 2018. Moored observations of mesoscale features in the Cape Basin: characteristics and local impacts on water mass distributions. *Ocean Science* **14**: 823-945.

Kock AA, O'Riain JM, Photopoulou T, Durbach I, Mauff K, Meyer M, Kotze D & Griffiths C. 2018. Movement patterns and site preference of a threatened apex predator, *Carcharodon carcharias*, along the inshore areas of False Bay, South Africa. *Movement Ecology* **6**: 7.

Lagabrielle E, Lombard AT, Harris JM & Livingstone T-C. 2018. Multi-scale multi-level marine spatial planning: a novel methodological approach applied in South Africa. *PloS One* **13**(7): e0192585.

Lemley D, Adams JB & Rishworth GM. 2018. Unwinding a tangled web: A fine-scale approach towards understanding the drivers of harmful algal bloom species in a eutrophic South African estuary. *Estuaries and Coast* **41**(5): 1356-1369.

Lemley DA, Adams JB & Strydom NA. 2018. Triggers of phytoplankton bloom dynamics in permanently eutrophic waters of a South African estuary. *African Journal of Aquatic Science* **43**(3): 229-240.



Lemley DA, Nunes M & Adams JB. 2018. Estuarine algal responses to increasing nitrate concentrations during closed mouth conditions of oligotrophic systems: A laboratory microcosm experiment. *Botanica Marina* **61**: 559-572.

Livingstone T-C, Harris JM, Lombard AT, Smit AJ & Schoeman DS. 2018. Classification of marine bioregions on the East coast of South Africa. *African Journal of Marine Science* **40**: 51-65.

Macamo C, Mabilana HA, Bandeira SO, Adams JB & Goncalves, V. 2018. Spatial dynamics and structure of human disturbed mangrove forests in contrasting coastal communities in eastern Africa. *Wetlands* **38**:509-523.

Makhado AB, Crawford RJM, Dias MP, Dyer BM, Lamont T, Pistorius PA, Ryan PG, Upfold L, Weimerskirch H & Reisinger RR. 2018. Foraging behaviour and habitat use by Indian yellow-nosed albatrosses *Thalassarche carteri* breeding at Prince Edward Island. *Emu - Austral Ornithology* **118**(4): 353-362.

Malauene BS, Moloney CL, Lett C, Roberts MJ, Marsac F & Penven P. 2018. Impact of offshore eddies on shelf circulation and river plumes of the Sofala Bank, Mozambique Channel. *Journal of Marine Systems* **185**: 1-12.

Mbandzi N, Wasserman RJ, Deyzel SHP, Vine NG & Whitfield AK. 2018. River flow zooplankton and dominant zooplanktivorous fish dynamics in a warm-temperate South African estuary. *Journal of Fish Biology* **92**(6): 1747-1767.

McGregor S & Strydom NA. 2018. The abundance, diversity and distribution of small fishes in mangrove and non-mangrove estuaries in warm temperate South Africa. *Scientia Marina* **82**(2): 81-93.

McLachlan A, Defeo O & Short AD. 2018. Characterising sandy beaches into major types and states: Implications for ecologists and managers. *Estuarine, Coastal and Shelf Science* **215**: 152-160.

Melly BL, McGregor G, Hofmeyr GJG & Plön S. 2018. Spatio-temporal distribution and habitat preferences of cetaceans in Algoa Bay, South Africa. *Journal of the Marine Biological Association of the United Kingdom* **98**: 1065-1079.

Nel L, Strydom NA & Adams JB. 2018. Prioritization of essential estuarine nursery habitats for juvenile fishes in select warm temperate estuaries, South Africa. *African Journal of Marine Science*.











Nel L, Strydom NA & Adams JB. 2018. Habitat partitioning in juvenile fishes associated with three vegetation types in selected warm temperate estuaries, South Africa. *Environmental Biology of Fishes* **101**: 1137-1148.

Ngqulana SG, Pistorius P, Galatius A, Plön S & Hofmeyr GJG. 2018. Variation in cranial morphology of bottlenose dolphins (genus Tursiops) off South Africa. *Marine Mammal Science* **32**(2): 617-636.

Nunes M, Adams JB & Rishworth GM. 2018. Shifts in phytoplankton community structure in response to hydrological changes in the shallow St Lucia Estuary. *Marine Pollution Bulletin* **128**: 275-286.

Ortega-Cisneros K, Yokwana S, Sauer W, Cochrane K, Cockcroft A, James NC, Potts WM, Singh L, Smale M, Wood A & Pecl G. 2018. Assessment of the likely sensitivity to climate change for the key marine species in the southern Benguela system. *African Journal of Marine Science* **40**(3): 279-292.

Parsons NJ, Vanstreels RET & Schaefer AM. 2018. Prognostic indicators of rehabilitation outcomes for adult African Penguins (*Spheniscus demersus*). *Journal* of Wildlife Diseases **54**(1): 54-65.

Passuni G, Barbraud C, Chaigneau A, Bertrand A, Oliveros-Ramos R, Ledesma J, Castillo R, Bouchon M & Bertrand S. 2018. Long-term changes in the breeding seasonality of Peruvian seabirds and regime shifts in the Northern Humboldt Current System. *Marine Ecology Progress Series* **597**: 231-242.

Peer N, Rajkaran A, Miranda NAF, Taylor RH, Newman B, Porri F, Raw JL, Mbense SP, Adams JB & Perissinottto R. 2018. Latitudinal gradients and poleward expansion of mangrove ecosystems in South Africa: 50 years after Macnae's first assessment. *African Journal of Marine Science* **40**(2): 101-120.

Peer N, Rishworth GM, Miranda NAF & Perissinotto R. 2018. Biophysical drivers of fiddler crab species distribution at a latitudinal limit. *Estuarine, Coastal and Shelf Science* **208**: 131-139.

Penry GS, Hammond PS, Cockcroft VG, Best PB, Thornton M & Graves JA. 2018. Phylogenetic relationships of southern African Bryde's whales inferred from mitochondrial DNA: support for subspecies delineation between the two allopatric populations. *Conservation Genetics* **19**(6): 1349-1365.



Raw J, Rishworth GM, Perissinotto R & Adams JB. 2018. Variable population density of *Cerithidea decollata* (Gastropoda: Potamididae) in relation to sediment conditions in a subtropical estuary. *African Journal of Marine Science* **40**: 461-466.

Reisinger RR, Landman M, Mgibantaka N, Smale MJ, Bester MN, De Bruyn PJN & Pistorius PA. 2018. Overlap and temporal variation in the diets of sympatric Antarctic and Subantarctic fur seals (Arctocephalus spp.) at Marion Island, Prince Edward Islands. *Polar Research* **37**: 14511421.

Reisinger RR, Raymond B, Hindell MA, Bester MN, Crawford RJM, Davies D, De Bruyn PJN, Dilley BJ, Kirkman S, Makhado AB, Ryan PG, Schoombie S, Stevens K, Sumner MD, Tosh CA, Wege M, Whitehead TO, Wotherspoon S & Pastorius PA. 2018. Habitat modelling of tracking data from multiple marine predators identified important areas in the Southern Indian Ocean. *Diversity and Distributions* **24**(4): 535-550.

Rishworth GM & Pistorius PA. 2018. Intrinsic and extrinsic controls on foraging effort in an iconic Benguela seabird. *Journal of Marine Systems* **188**: 142-148.

Rishworth GM, Perissinotto R, Bird MS & Pelletier N. Grazer responses to variable macroalgal resource conditions facilitate habitat structuring. *Royal Society Open Science* **5**: 171428.

Sherley RB, Barham BJ, Barham PJ, Campbell KC, Grigg J, Horswill C, McInnes AM, Morris T, Pichegru L, Steinfurth A,Votier SC, Weller F & Winker H. 2018. Bayesian inference reveals positive but subtle effects of experimental fishery closures on marine predator demographics. *Proceedings of the Royal Society of London B* **285**: 20172443.

Taljaard S, Van Niekerk L & Lemley DA. 2018. A glimpse into the littoral nutrient dynamics of a lake system connected to the sea. *Water SA* **44**(1): 64-74.

Thiebault A, Dubroca L, Mullers RHE, Tremblay Y & Pistorius PA. 2018. m2b package in R: Deriving multiple variables from movement data to predict behavioural states with random forests. *Methods in Ecology and Evolution* **2018**(00): 1-8.

Traisnel G & Pichegru L. 2018. Possible drivers of nest usurpation in African penguins. *Marine Ornithology* **46**: 19-22.







Traisnel G & Picheru L. 2018. Does it always pay to defend one's nest? A case study in African penguin. *Ethology* **124**: 74-83 .

Traisnel G, Pichegru L, Visser H & Edwards L. 2018. Colour aberrations in African Penguins. *Marine Ornithology* **46**: 19-22.

Van As HJ. 2018. Challenges and solutions concerning the inspection/investigation dichotomy in the context of transnational organised fisheries crime: A South African example. *Marine Policy*.

Van As HJ. 2018. Kan munisipale wetstoepassingsbeamptes goedsmoeds op die publiek losgelaat word? *Litnet*.

Vanstreels RET, Ferreira JFC, Dutra DDA, Epiphanio S, Braga ÉM, Pistorius PA & Catão-Dias JL. 2018. Investigation of *Babesia* sp. in pygoscelid penguins at the South Shetland Islands. *Polar Research* **37**(1): 1500267.

Vanstreels RET, Hurtado R, Egert L, Mayorga LF, Bhering RCC & Pistorius PA. 2018. Discolored and worn-out plumage in juvenile Magellanic penguins (*Spheniscus magellanicus*) found ashore in southeast and northeast Brazil. *Brazillian Journal of Ornithology* **26**: 202-206.

Vanstreels RET, Proctor H, Snyman A, Hurtado R, Ludynia K, Parsons NJ & Pistorius PA. 2018. Nasal mites (Mesostigmata: Rhinonyssidae) in African penguins (Spheniscus demersus). *Parasitology* **146**(1): 121-127.

Vanstreels RET, Yabsley MJ, Parsons NJ, Swanepoel L & Pistorius PA. 2018. A novel candidate species of Anaplasma that infects avian erythrocytes. *Parasites and Vectors* **11**: 525.

Vanstreels RET, Yabsley MJ, Swanepoel L, Stevens KL, Carpenter-Kling T, Ryan PG & Pistorius PA. 2018. Molecular charcterization and lesions associated with *Diomedenema diomedeae* (Aproctoidea: Desmidocercidae) from grey-headed albatrosses (*Thalassarche chrysostoma*) on Subantarctic Marion Island. International Journal for Parasitology: Parasites and Wildlife **7**: 155-160.

Vargas-Fonseca OA, Kirkman SP, Conry D, Rishworth GM, Cockroft V & Pistorius PA. 2018. Distribution and habitat use of Indo-Pacific bottlenose dolphins *Tursiops aduncus* along the southeast coast of South Africa. *African Journal of Marine Science* **40**(4): 439-450.

Vermeulen E, Bouveroux T, Plön S, Atkins S, Chivell W, Cockcroft V, Conry D, Gennari E, Hörbst S, James BS, Kirkman S, Penry G, Pistorius P, Thornton M, Vargas-Fonseca OA & Elwen SH. 2018. Indian Ocean humpback dolphin (*Sousa plumbea*) movement patterns across the South African coast. *Aquatic Conservation: Marine and Freshwater Ecosystems* **28**: 231-240.

Vogt T, Pieters R & Newman BK. 2018. PAHs, PCBs and OCPs in sediments from three catchments in Durban, South Africa. *Journal of Aquatic Science* **43**: 35-49.

Weston RA, Perissinotto R, Rishworth GM & Steyn P. 2018. Macroinvertebrate variability between microhabitats of peritidal stromatolites along the South African coast. *Marine Ecology Progress Series* **605**: 34-47.



Popular Articles & Mixed Media

NEWSPAPER ARTICLES, POPOLAR ARTICLES & NEWSLETTERS

- Fish farm in sync with environment. Guy Rogers, The Herald (18 May).
- New species finding on PE coast. Guy Rogers, The Herald (23 February).
- Varsity turns tide on thugs. Godfrey Sigwela, Daily Sun (2 November).
- Plunging into new waters: Investigating a novel marine protected area management plan in South Africa. Tayla Ginsburg, Dr Lorien Pichegru and Professor Mandy Lombard, SANCOR Newsletter, Issue 220.
- Squiggly lines, new methods and big ideas. Theoni Pototpoulou, Animal Ecology in Focus (the official blog of the British Ecological Society Journal of Animal Ecology).
- A multi-disciplinary step towards better understanding benthic ecosystems off the west coast of South Africa. Zoleka Filander, DeepSea Life.
- A number of FishFORCE Academy articles were published in Servamus: Your Community-based Safety and Security Magazine throughout 2018.

TV & RADIO NEWS

Zoleka Filander, a senior student with the SARChI Marine Spatial Planning research group, collaborated on a short documentary and an educational app that supports the marine science module for Grade 11 and Grade 12 learners. This was covered by *News24* and *SA Tourism*.



ENGAGEMENT

Academic Engagement

Public Engagement

Collaborations & Visits

BIO373: INTRODUCTION TO SOUTH AFRICAN MARINE ECOSYSTEMS

This course is presented annually to students from the College of Saint Benedict and the Saint John's University, and was run through the CMR and in collaboration with the International Office. Dr Gavin Rishworth presented this course again in 2018, and his class consisted of 17 students from varied academic backgrounds.

Saint Benedict 🖶 Saint John's

UNIVERSITY

MANAGEMENT OF ESTUARIES IN SOUTH AFRICA

In collaboration with the Western Cape government and CapeNature, Professor Janine Adams hosted this Short Learning Programme (SLP) from 27-29 March, at the SANParks Rondevlei Office, Sedgefield. The course components were compiled and presented by the Estuarine Research Team. This is an official Nelson Mandela University SLP, and it was attended by 27 people.



OTHER ENGAGEMENT INITIATIVES

Professor Janine Adams and her team led a workshop for DAFF and DEA concerning **estuarine water quality management**. This workshop ran from 21-23 November at Plettenberg Bay, and CapeNature collaborated and assisted with organising this training opportunity. A formal SLP is planned for 2018.

Professor Mandy Lombard was the convenor of the Marine Spatial Planning Course on the International Oceans Institute (South Africa) Ocean Governance Training Programme for Africa. This event took place in Kirstenbosch in September.

Ms Jodie Reed, PhD candidate with the SARChI Marine Spatial Planning, was involved in the arrangement of monthly meetings for the **R-Ladies Cape Town Chapter** of R-Ladies Global, a non-profit organisation aiming to increase diversity in the R Community.

The Research Diving Unit supervised 90 dive days during 2018.



ACADEMIC PROGRAMMES

CMR Members were also involved in developing three academic programmes:

Nelson Mandela University / HOME Marine Spatial Planning Masters Programme.

Masters in Oceanography Programme: This joint, collaborative programme is being developed by the Nelson Mandela University, University of Cape Town, University of the Western Cape, and the University of Fort Hare. The University of Cape Town and the Nelson Mandela University will be the key drivers, each presenting one fundamental module. The other two partner universities will present elective modules, according to their strengths.

LLM Ocean Governance Programme: This was finalised by the Faculty of Law and approved by all the Nelson Mandela University structures.

CMR PRESENCE

The CMR was represented, mainly through its Directorship, at the following occasions:

- SAIMI Launch: 25 June, Ocean Sciences Campus.
- Indian Ocean Africa Photographic Exhibition by Professor Rose Boswell: 23 August, 2nd Avenue Campus.
- IORA Cocktail Function and Gala Dinner: 12 September, Raddison Blu Hotel.
- Change of Naval Command at the Port Elizabeth Harbour.
- SMCRI Launch hosted by SAEON: 19 October, Ocean Sciences Campus.
- Garden Route Interface Meeting 2018 for science, policy and management.
- Norwegian Minister for Research and Education and Norwegian Ambassador to SA visit: 29 October, various University Campuses.
- Sustainable Seas Trust Symposium: 29 October, North Campus Conference Centre.

The CMR was represented, by members, at the following events:

- ICEMASA: SAEON members attended, Professor Mike Roberts presented and Professor Mandy Lombard chaired a session at this event (22-25 October).
- SAIIA Invitation: "Ecosystem-based Adaptation in South African Coastal Cities". This was held in Cape Town, and Estee Vermeulen and Clyde Scott represented the CMR.
- Addo Marine Science Symposium: 25 October, Addo Elephant National Park.
- DEA Microplastics Workshop: Held 21 November in Pretoria. Michael Hart-Davis attended.
- Dr Pichegru attended the African Penguin Habitat and Population Reinforcement Working Groups event in Cape Town in April.



Community Engagement

During 2018, the CMR focussed heavily on involving staff, students, research collaborators, and external stakeholders in events to increase membership and to promote the importance of transdisciplinary research.

The following events and community engagement projects and initiatives were hosted and arranged by the CMR Office during 2018:

LIVING SHORES BOOK LAUNCH

It was an honour to host Professor George Branch and Margot Branch for the Port Elizabeth launch of the long-anticipated revised edition of their iconic book, Living Shores: Interacting with southern Africa's marine ecosystems. This event took place at the North Campus Conference Theatre on 19 March. The venue was filled to capacity, with over 100 people in attendance. The book was sold at a special rate at this event.



CIRCULAR PRODUCTION OF MARINE FOOD

Dr Susanne Lindegarth and Dr Elisabeth Jönsson Bergman were hosted by the CMR for a workshop during May, and as part of their visit, Dr Bergman presented on SWEMARC – The Swedish Mariculture Research Centre at the University of Gothenburg, Sweden. This took place on 14 May at the North Campus Conference Theatre. The topic of this lecture was very specific and although only 30 people attended, it was of great value to those researchers interested and involved in mariculture research. Mr Guy Rogers, Environment and Science Writer at *The Herald* and *Weekend Post*, wrote an article about the discussion, entitled *Fish farm in sync with environment*. This article appeared in *The Herald* on 18 May.





AFRICAN MARINE MAMMAL COLLOQUIUM (AMMC)

Along with the Port Elizabeth Museum at Bayworld and in collaboration with Spar Eastern Cape, the Department of Environmental Affairs, and The Society for Marine Mammalogy, the CMR co-hosted the biennial 5th Meeting of the African Marine Mammal Colloquium (AMMC) with the theme New Frontiers in Marine Mammal Biology. This event took place from 20-23 August at the Bayworld Events Complex, and was also the biggest event in this series to date with 66 participants. This was the first time that this event was hosted outside of the Western Cape, and it was also a single-use plastic free event. Hosting this in the Eastern Cape was significant for the following reasons:

- Moving it out of the Western Cape allowed researchers to look at other regions of South and southern Africa.
- More marine mammal researchers from elsewhere in Africa and the world doing marine mammal research were included.
- This event was made more inclusive of students from different backgrounds.
- Talks by different conservationists and people passionate about marine research but that are not necessarily involved in research themselves, could attend.
- Presentations in novel directions and fields were encouraged.

Three international and one national plenary speakers delivered key presentations. Plenary speakers were as follows:

- Dr Yves Cherel: Director of Research, Centre d'Etudes Biologiques de Chizé, CNRS, France.
- Professor Ann Pabst: Chair Society of Marine Mammalogy, University of North Carolina Wilmington, United States of America.
- Dr Mario Acquarone: Chair European Cetacean Society Marine and Freshwater Research Institute, Iceland.
- Professor Ken Findlay: Chair Cape Peninsula University of Technology, Research Chair in Oceans Economy, South Africa.







NATIONAL MARINE WEEK

In celebration of National Marine Week (October), the CMR hosted a photo competition open to all University staff and students. The University community was encouraged to submit photographs under the theme **Marine Treasures of Algoa Bay**. The winning photograph was taken by Mr John Werth, the CMR's first registered Professional Associate. His winning photograph showed Algoa Bay's Bird Island at sunset, highlighting the African penguin and Cape gannet colonies. As the prize, Mr Werth received a copy of the book *Know Your Bay: A Guide to the Features and Creatures of our Algoa Bay Hope Spot*. His photograph was also printed as an A1 canvas poster for display in the CMR Office, and it is featured on the cover of this CMR 2018 Glossy Report.





RESEARCH SYMPOSIUM

The CMR's Annual Research Symposium took place on 16 November at the North Campus Conference Theatre. The Symposium's theme was Celebrating Research Associates, with the aim of highlighting research done by our valued collaborators. Dr David Kaplan, a visiting researcher from the IRD (France), was hosted for a series of collaboration meetings by the CMR at the time, and he was the plenary speaker for this event. A total of fifteen speakers shared their research under the Themes:

- Coastal Interface
- Algoa Bay Community of Practice
- Conservation
- Estuaries

The CMR was delighted that the venue was filled to capacity for the majority of the sessions.

The CMR also hosted a number of side events at the adjacent Venue 2 during the day:

- Professor Jean Greyling launched the new two-player BOATS mobile app and board game. This app is designed to educate children about plastics in the ocean whilst facilitating the development of coding skills. The board game was sold at a reduced rate at the Symposium, and the proceeds were donated to SANCCOB Eastern Cape.
- Algoa Bay CoP stakeholders attended the second session dedicated to the Algoa Bay Community of Practice Project, followed by a working lunch for strategising and project updating purposes.
- An afternoon session for selected Nelson Mandela Bay Maritime Cluster members involved in business development to focus on maritime incubation and the development of ocean business (taking into consideration SMEs and emerging entrepreneurs wishing to enter the maritime sector), was hosted by the CMR.

After the presentations and side-events, CMR members were invited to a cheese and wine function to conclude 2018 CMR public events.



The following events were not coordinated by the CMR Office, but were arranged by CMR members:

COMMUNITY VOICES: ENGAGING WITH PEOPLE IN CONSERVATION

This event was a practical, participatory workshop to explore the potential for improving resource management and conservation interventions by integrating the human dimension. The workshop was grounded in the consideration of relevant regional case studies and the application of the Community Voice Method – a novel, solutions-focused method that uses film and qualitative analysis to engage communities in shaping sustainable futures. This event was arranged by Professor Ronel Nel, and was presented by Dr Peter Richardson and Mrs Sue Ranger. It took place from 10-11 April at the Nelson Mandela University South Campus.

KNOW YOUR BAY BOOK LAUNCH

The Algoa Bay WESSA branch produced a book entitled Know Your Bay: A Guide to the Features and Creatures of our Algoa Bay Hope Spot. A number of CMR Members contributed in the form of articles, editorial submissions and photographs. This book was launched by WESSA and Fogarty's Bookshop at the GFI Art Gallery on 17 April with University staff and students, local collaborators and members of the public in attendance. Dr Lorien Pichegru, one of the editors for this book, presented at this occasion.



WELCOMING THE WHALES FESTIVAL

On 16 June, a festival to celebrate the arrival of Humpback whales in Algoa Bay was held at the Pine Lodge Resort. This event was arranged by Raggy Charters, various conservation projects and NGOs. Festival-goers were educated on the migration paths of these whales (as well as given information on Southern Right, Bryde's, Minke and Killer whales), and were taken to various vantage points in the Cape Recife area to observe the whales. A number of displays were set up, highlighting marine conservation and research efforts:

- CMR and Nelson Mandela University: The CMR set up a photographic display and CMR promotional materials were available. Input on the latest cetacean research in and around Algoa Bay was shared with the public by CMR academic members and postgraduate students. Fine Arts students from the Arts Department created whale artwork during the course of the day.
- Bayworld: Whale parts that have washed up on Algoa Bay's shores were put on display and information on the history of whaling was available.
- Algoa Bay Hope Spot: They highlighted the importance of making the public aware of these whale migrations.
- Wildlife Society of South Africa and the Baywatch Marine Conservation Project: These groups had displays on the plight and conservation of cetaceans around the world.



PEOPLE'S PORTS FESTIVAL

This second festival of its kind was held at the Port Elizabeth Port on 1-2 December. This festival is hosted with the aim of focusing on the Port and its operations, but also to educate the general public on topics relating to the ocean, environmental impact issues and the ocean economy. The day consisted of a number of interactive educational displays, and the CMR had a stand at this event to promote our transdisciplinary research and marine courses offered at the Nelson Mandela University. Photographs depicting the marine environment were put on display, and CMR branding and marketing materials were also available. A BOATS team was also present, marketing this tool to educate children about plastic pollution in the ocean whilst developing coding skills.



LECTURES, PUBLIC TALKS & OTHER EVENTS

Dr Gwen Penry (SARChI: Marine Spatial Planning) delivered a presentation on Marine Tourism Sustainability and the Bryde's whale tagging project to BirdLife Plettenberg Bay in May. The same presentation was delivered to the public on World Oceans Day (8 May) at the Fat Fish Restaurant, Plettenberg Bay.

Professor Mandy Lombard delivered her Inaugural Lecture at the Nelson Mandela University in October 2018. Her lecture was entitled: So long and thanks for all the fish: A hitchhiker's guide to saving the sea.

Dr Lorien Pichegru arranged eight Know Your Bay public lectures, hosted at Bayworld, throughout 2018.

Ms Kaylee Smit (SARChI Marine Spatial Planning) arranged a screening of Chasing Coral to create environmental awareness at the Durban Underwater Club (7 December). She arranged a beach clean-up and engagement with the Crawford North Coast High School in October, and presented on Marine Protected Areas at the Marine Surf Lifesaving Club on 12 December.

Ms Estee Vermeulen arranged SAMSA Bunkering Stakeholder and Algoa Bay Project Stakeholder meetings.

Dr Gavin Rishworth presented a lecture entitled To the beginning and beyond: the unexpected discoveries on the shorelines off Algoa Bay to the Port Elizabeth Woman's Club on 2 November.

Dr Lorien Pichegru was an invited speaker at the Spar launch of the Stop the Plastics campaign.



International Collaborations & Visits

Collaborations, particularly with international researchers, have increased in recent years with the CMR entering into consecutive years of staff and student exchange and funding agreements. Below are a few highlights from 2018:



UNIVERSITY OF GOTHENBURG

The **Erasmus Mundus + Exchange Programme**, which has been running between the CMR and our Swedish colleagues since 2017, was renewed for another two years and the new exchange will run until June 2019. The programme aims to develop research collaborations and makes provisions for the following:

- 2 x Outbound MSc students for ten months in total
- 1 x Incoming Teaching staff from Sweden to South Africa for 18 days in total
- 2 x Outbound Administrative staff

Dr Susanne Lindegarth and Dr Elisabeth Jönnson Bergman visited the Nelson Mandela University and were hosted by the CMR from 13-14 May. This was a precursor visit in preparation for their visit to Pretoria to develop SASUF applications. The aim of their visit to the CMR was to discuss further collaborations in the field of aquaculture. Dr Bergman gave a public lecture on Swedish mariculture research on 13 May. Two Nelson Mandela University staff members, Dr Bernadette Snow and Dr Tim Pittaway, visited the University of Gothenburg from 6-14 October. Dr Pittaway visited under the Administrative Staff category. Ms Asisipo Mhlonyane visited the University of Gothenburg from 6 October to 21 January 2019 as part of the student exchange.



UNIVERSITY OF SOUTHAMPTON

The RCUK-NRF Newton Fund International Partnering Scheme facilitates building sustainable, long-lasting links between the United Kingdom and international research organisations to support the training of PhD students and post-doctoral fellows, with the aim of developing an international cohort of early career researchers. This exchange programme has been running between the Nelson Mandela University (through the CMR) and the University of Southampton since 2016, and both Universities applied for no-cost funding extensions to further develop this collaboration in 2019.

Dr Daniel Lemley was the only student to travel for this exchange during 2018 (15 November to 9 December). Professor Duncan Purdie from the National Oceanography Centre was his host, and they worked around the topic of harmful algal blooms in South African estuarine and coastal waters. As a result of this exchange, a student (Africa Gomez Castillo) was identified to travel to South Africa to be hosted by Professor Janine Adams to gain experience working on South African estuarine systems during 2019.

Further exchanges for Dr Gavin Rishworth and Ms Sixolile Mazwane were approved in 2018, but travel only occurred in 2019. Dr Rishworth would travel as a staff member (5-19 January), and his planned collaboration was with Dr Thomas Ezard on assessing knowledge gaps related to the costal value, persistence or role of living peritidal stromatolites. Sixolole's student exchange was planned for 12 May to 23 June, to work with Dr Anna Hickman on using satellite data to investigate primary production in the Agulhas Bank.

NELSON MANDELA

UNIVERSITY

Southampton

PLYMOUTH UNIVERSITY

The CMR has known expertise in coastal and nearshore ecology, and Plymouth University (United Kingdom) has a global reputation in marine science, coastal geomorphology and hydrodynamics. Each September, for the last four years, 10-15 students enrolled in the Plymouth University's Ocean Science Field Course and Nelson Mandela University Zoology postgraduate students and staff from both universities met for five days at the Sundays River to exchange expertise and conduct collaborative research in different coastal habitats. In 2018, Professor Gerd Masselink, Dr Timothy Scott, Mr Richard Kenyon and 11 students from Plymouth University visited the Sundays River from 6-14 September. Professor Ronel Nel, Mr Anton Cloete and two postgraduate students from the Nelson Mandela University supported the Plymouth University team. Due to the smaller student group, the estuarine research component was postponed to 2019 but research on two projects was conducted:

- Swash migration by the plough snail Bullia rhodostoma
- Dune-beach profile and surfzone dynamics

This research team is also working on a new initiative, related to a low-cost method for mapping inshore circulation.





UNIVERSITY OF NORTH CAROLINA WILMINGTON

A USAID proposal was written by CMR members for funding for a Community aquaculture sustaining livelihoods project. This was put on hold due to political support lacking in the United States at the time for such joint collaboration. However, direct linkages were maintained.

BRUNEL UNIVERSITY

The CMR hosted a Plastics and Society Stakeholder Workshop on 15 March at the Nelson Mandela University Business School. At this gathering, Professor Leitch provided context, and Dr Snow elaborated on the work done by the CMR. Professor Susan Jobling from Brunel University (United Kingdom) provided details on the project proposal, overview and process, and six work packages were brainstormed by those researchers committed to collaborating on this project. Following from this workshop, the CMR and Brunel University provided input on the GCRF-RCUK Plastics in Society Full Proposal. The proposal was submitted in June, and the unsuccessful outcome was communicated in November. However, this exercise led to the development of a strong cohort of plastics researchers in the CMR.

UNIVERSITY OF OLDENBURG

A delegation from Germany visited the University in November 2017, with an interest in establishing marine science linkages. As a follow-up visit, Professor Helmut Hillebrand and Ms Ruth Krause were hosted by the CMR from 22-24 October 2018 to discuss funding proposals for exchanges with Ocean Sciences. Professor Hillebrand and Ms Krause met with the following University staff to discuss future collaborations: CMR Director/Chair SARChI Shallow Water Ecosystems, CMR Acting Director, CMR Acting Deputy Director/MAPRU Manager, HoD Zoology Department, HoD Botany Department, Research Management, Research Capacity Development, Innovation Office, SAEON Elwandle Node Manager, and Dean of Science. Furthermore, a lunch by invitation only was hosted on 22 October to introduce the visitors to other key players involved in marine research at the University, and they were introduced to CMR postgraduate students at a lunch and short presentation session on 23 October. The possibility for an amendment to the current MoU was discussed, whereby a Humboldt Exchange Programme was suggested, as well as cobadging possibilities. Specific areas of research interest were identified: drivers of change; biodiversity and conservation; island ecosystems; polar research and marine spatial planning; micro-plastics; acoustics and community change; island-sea estuaries; governance. Following this visit, the CMR will arrange a workshop open for attendance by relevant stakeholders scheduled for 2019.





FRENCH NATIONAL INSTITUTE FOR RESEARCH DEVELOPMENT

Dr David Kaplan, Associate Researcher at the IRD, was hosted by the CMR from 13-16 November. Dr Kaplan's current research focuses on assessing the effects of different forms of spatial and non-spatial fisheries management on marine populations, but he also has experience in oceanography, population and species distribution modelling, resource management and conservation. Whilst visiting, Dr Kaplan met with CMR Acting Director, CMR Acting Deputy Director, SAEON, SAIAB and SARChI Ocean Science and Marine Food Security to discuss potential future collaborations. A two-month sabbatical visit is planned for Dr Kaplan during 2019. He delivered the plenary lecture at the CMR's Research Symposium on 16 November: Squaring data models in larval connectivity studies: Conceptual differences, uncertainties and future challenges.

Dr Jean-François Temon spent ten days at the Ocean Sciences Campus in May, working with the MADridge team. This is the first step of an exchange of researchers and students between the Nelson Mandela University and France.

The IRD, French National Centre for Scientific Research, Brest and the University of Bordeaux are also exploring collaborating on the development of an Oceanography Masters Programme and other areas of research.







ADDITIONAL INTERNATIONAL COLLABORATIONS & VISITS

Climate Service Centre, Germany: Dr Bernadette Snow and Professor Mandy Lombard visited this Centre in April to collaborate on the development of climate services projects, particularly in light of **building resilient cities**.

WIOMSA Cities and Coast Proposal: this proposal was accepted.

Horizon2020 Proposal: Algoa Bay as a case study.

Workshop with delegates from Taiwan to explore collaboration opportunities.

Dr Gwen Penry, Mr Jonathan Botha, Ms Estee Vermeulen, Ms Zoleka Filander and others represented the SARChI Marine Spatial Planning during a number of **international exchanges**. These include collaborations with the Falklands Conservation, the Hopkins Marine Station of Stanford University, Deakin University and the Smithsonian Institution.

Dr Maëlle Connan visited the University of Montpellier and the University of La Rochelle to work on a **fur seal isotope** project.

Dr Lorien Pichegru was an invited speaker at the Centre d'Etude Fonctionelle et Evolutive in Montpellier in March.

Professor Janine Adams and Dr Jackie Raw visited Professor Kerrylee Rogers (University of Woolongong, Australia) for collaborative research in **response of coastal habitats to climate change**.

Professor Patrick Vrancken contributed to the International Sustainable Development Law Programme at Antwerp University on 8 September, and he presented an overview of the International Law of the Sea during this occasion.

Professor Mandy Lombard collaborated on advancements in ecosystem-based approaches to Marine Spatial Planning in South Africa at the University of St Andrews, Scotland, in April.

Dr Kerry Sink assisted Professor Lombard at a round table discussion on **special features in South Africa's proposed offshore marine protected areas** at the University of Strathclyde, Scotland, in April 2018.



PROJECT & FUNDING OUTPUT



Funding Grants & Project Applications Written

New Funding

Continuing Projects & Funding

New Initiatives

Contract Studies

Finalised Projects & Contracts

Other

52

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Funding Grants & Projects Applications Written

PLASTICS IN THE MARINE ENVIORNMENT

Towards the end of 2017, Professor Andrew Leitch was approached by a consortium of Universities (Brunel University; King's College; Plymouth University; Plymouth Marine Laboratory) regarding becoming involved in marine waste/litter research. Together with Brunel University, the CMR provided input on the **GCRF-RCUK Plastics in Society** Proposal. This consisted of six Work Packages. The proposal was submitted in June, and the CMR was notified in November that this proposal was unsuccessful.

SUSTAINABLE OCEAN GOVERNANCE

A One Ocean Hub proposal for the GCRF-RCUK funds was written by Professors Mandy Lombard, Patrick Vrancken, Rose Boswell and Dr Bernadette Snow. In November it was communicated that this proposal was successful. Total funding for this global multiinstitutional and multidisciplinary project is over £20 million, of which over R20 million will fund research in the CMR over a five year period (2019-2023). The Hub will carry out innovative research and integrate knowledge translation towards its vision to enable **integrated ocean governance** for equitable and inclusive sustainability.

COMMUNITY AQUACULTURE

A Proposal to host a **SASUF** 2019 workshop around sustainable aquaculture development for coastal communities and food security was submitted, and R73 000 was granted for this.



Professor Ronel Nel was informed towards the end of 2017 that she had been awarded a **PEW Fellowship** of \$50 000 for a period of three years. The announcement was made in February 2018. Professor Nel was one of eight outstanding mid-career scientists working on important marine conservation issues. Her project will focus on the factors that cause South African turtle populations to become refugee species. She will reconstruct the demographic histories of sea turtles using a combination of contemporary, historical, and genetic data. Satellite tags will be deployed to evaluate turtle movements and to conduct field surveys for the collection of information about the health of selected turtle populations.

The Office of the Premier of the Eastern Cape launched the Operation Phakisa Oceans Economy initiative and established a provincial Operation Phakisa Task Team. Researchers from the Nelson Mandela University are involved in six focus areas, and the project objective is to implement the National Development Plan with the ultimate goal of boosting economic growth and create employment through oceans economy for the benefit of its citizens. Funding to the value of R450 000 was dedicated to this, with the possibility of extension.

Dr Maëlle Connan received a Marine and Coastal Research Grant for 2019-2021, in collaboration with Professor Sophie von den Heyden (University of Stellenbosch). This project will investigate molecular scatology as a tool to update dietary information of southern African seabirds. This grant is R1.935 million over a three-year period (2019-2021).

Professor Pierre Pistorius received in the region of R750 000 for seabird research through his association as core member of the FitzPatrick NRF/DST Centre of Excellence. Dr Lorien Pichegru received a further amount of R300 000.



CONTINUING PROJECTS

The African Coelacanth Ecosystem Programme (ACEP) Canyons Connection Project is the first biological, geological and oceanographic survey of marine canyon heads off South Africa's East Coast. Professor Mandy Lombard leads this project, and Wildlands and the Ocean Stewards Programme are collaborators.

The Algoa Bay Community of Practice (CoP) Project, under leadership of Professor Mandy Lombard (SARChI Marine Spatial Planning, Nelson Mandela University) and Professor Rosie Dorrington (SARChI Marine Natural Products, Rhodes University) continued its work during 2018. The first round of funding will come to an end in August 2019. The application for Phase 2 will be written in 2019.

Professor Michael Roberts received funding for his SOLSTICE (Sustainable Oceans, Livelihoods and food Security Through Increased Capacity in Ecosystem research) programme (R19 million for a four-year period) in 2017. This project tackles challenges by growing people-based marine research capability in southern and eastern Africa. He was heavily involved in the 12 month stage gate review towards the end of 2018.

Professor Pierre Pistorius and Dr Maëlle Connan's SANAP projects started in 2018. Their projects were entitled Southern Indian Ocean Top Predators: Linking ecology, oceanography and marine spatial planning needs (R5 million) and Small Procellariiformes as indicators of ecosystem changes and plastic pollution (the co-Principal Investigator is Professor Peter Ryan from the FitzPatrick Institute of Ornithology, University of Cape Town: R1.887 million over three years – 2018-2020). Both projects will run until 2020.

Professor Janine Adams received funding from the Water Research Commission (2017-2019) for a study on Blue Carbon habitats and responses to climate change.

Long term socio-ecological research in collaboration with the Sustainability Resource Unit and others.

Plettenberg Bay research, monitoring and diving hub under the SARChI Marine Spatial Planning in collaboration with WWF and the Nature's Valley Trust. A collaboration with Standford University on tagging of Bryde's whales (lead by Dr Gwen Penry) is also underway.

Collaborations with the Faculty of Engineering, the Built Environment and Information Technology on drones to monitor abalone movement and tracking research. Collaborations with the Faculty of Health Sciences on developing diver and skipper training.

CONTINUING MoUs & MoAs

Joint research and diving continued with CapeNature. SAEON and SAIAB remain collaborators on various projects. Joint research also continued with the DEA. The Abalone Seeding Project was served through an agreement with the Nelson Mandela University, University of Fort Hare, Rhodes University and Lidomix. The final reports for the Seekoei Estuary Project (Kouga Municipality) were written in 2018, concluding this project.

New Initiatives

Helmholtz-Zentrum Geesthacht Zentrum für Material- und Küstenforschung GmbH (Centre for Materials and Coastal Research), Climate Service Centre (GERICS) HZG, Germany: This is a collaboration in the field of climate adaptation in coastal cities, and it includes joint applications for funding, writing proposals, building capacity in the development of climate services, system dynamics modelling, policy formulation, and leverages of change.

The CICLICO project, looking at climate change in cities situated in the coastal Western Indian Ocean, received funding for three years. This project is lead by Dr Snow and Professor Lombard.

A Port Elizabeth Museum at Bayworld MoU was being revised for new collaborative relationships in areas of research and education.

An INTPART Research Council of Norway PO²SABCIN project's goals are compliant with the Nelson Mandela University strategy for research and education in the field of operational oceanography and marine environmental modelling. This is a developing initiative.

SANOCEANS is a bilateral Norway-South African call, and it links with the University of Cape Town and Bergen. Institutional support was received from the Nansen-Tutu Centre for Marine Environmental Research and the Marine and Climate Research to Operations and Services (MACROS) project. The CMR collated a conceptual note, and this could provide good funding for the Arts and Humanities, particularly considering marine and cultural heritage. This is based on existing projects, and unfortunately did not receive approval.

An ILOSA call for proposals around sustainable, urban coastal cities development was circulated, and Professor Rose Boswell (Dean: Faculty of Arts) was requested to participate. This was an opportunity for a multi-disciplinary project.



Contract Studies

The Benguela Current Ecologically or Biologically Significant Marine Areas (EBSA) Project, lead by Dr Stephen Holness, is funded by the GIZ to the value of about R 7.2 million. The CMR is providing professional support to the Benguela Current Commission (BCC), its three member states (Angola, Namibia and South Africa) and other key stakeholders in the marine management sector to reach the objectives of the Benguela Current Convention regarding the enhanced sustainable management and governance of the Benguela Current Large Marine Ecosystem's (BCLME) marine biodiversity and natural resources. The main focus of the project is capacity development at various levels, to identify, describe, assess vulnerabilities and improve the management of the Benguela EBSAs. Negotiations were underway during 2018 to extend the contractual agreement until the end of 2019.

Dr Berny Snow and Professor Mandy Lombard led the Department of Environmental Affairs' National Coastal Assessment. A total of R 333 470 would be received upon deliverables.

Water quality assessments for the North End Lake requested by the Nelson Mandela Bay Development Agency, were planned. The CMR invoiced for R248 525.70 in 2017, and this was received in 2018.



Finalised Projects & Contracts

The Seekoei Mouth and Estuary Management Plans for the Kouga Municipality were completed in 2018. The reports were submitted and accepted. A total of R114 000 was received.

Professor Mike Roberts' first big ecosystem functioning project, MADridge, came to a close. This is a Nelson Mandela University-France project involving researchers and postgraduate students that focus on the main seamounts on the Madagascar Ridge – an area of enhanced productivity. Two workshops were held in Sete (France) in 2018 to process the data collected from three cruises using the Research Vessels *Antea* and the *Marion Defresne* in 2016 and 2017. An exciting outcome was the preparation of 18 articles covering topics from ocean physics to fish, to be published in a Special Issue in *Deep Sea Research II*.

FINANCIAL STATEMENT

Institute for Coastal and Marine Research (CMR) Cost Centres: N186 & N187

Research Diving Unit (RDU) Cost Centre: EB35

The Financial Statement below provides figures for the CMR's Contract and Reserve Cost Centres (N186 & N187) as well as for the RDU's RB35 Cost Centre.

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, EB35

INCOME STATEMENT FOR PERIOD :

Year 2018

Opening Balance	1 329 182
INCOME Private grants restricted	2 416 853 510 137
Interest Received	1 825 550 81 166
EXPENDITURE Salaries Conference Expenses Operating expenses Catering Admin Fee Bursaries Equipment	2 571 935 133 171 2 137 981 42 851 257 528 403
Closing Balance	1 174 101
Project Invoices not paid	254 878
Available Balance	919 223
Name :	Rheinard van Onselen
Title :	Accountant Research and Third Stream Income

60

Signature :

2019/04/08

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