

NELSON MANDELA

UNIVERSITY

INSTITUTE FOR COASTAL
AND MARINE RESEARCH
(CMR)

QUARTER 2
NEWSLETTER

2023

CMR

COASTAL & MARINE
RESEARCH

NOTE FROM THE DIRECTOR

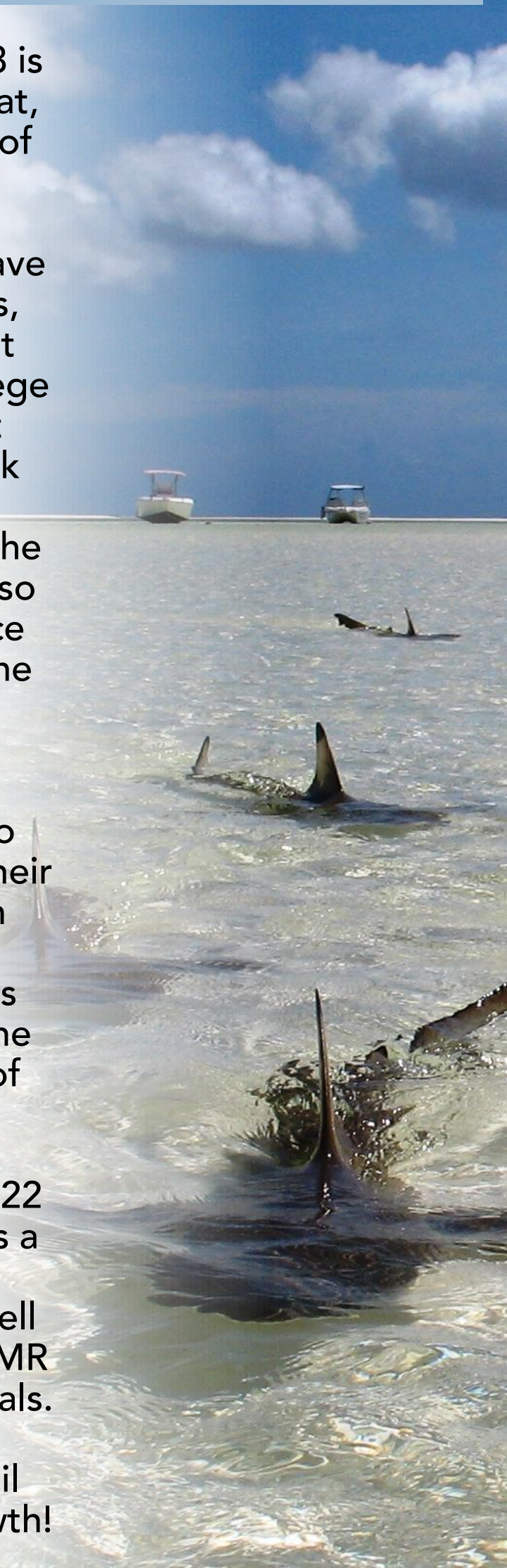
The second quarter of 2023 is nearing an end and with that, my time as acting director of the CMR.

These two and half years have been filled with challenges, achievements, growth, but also joy. It has been a privilege to work with an excellent office team, with high work ethic and always smiling. The deputy directors and the management committee also made the whole experience felt as a solid teamwork. The ship was led by many supportive hands.

Most importantly, I wish to thank all our members for their hard work and dedication towards transdisciplinary ocean and coastal sciences research, contributing to the CMR's strong reputation of excellence.

Indeed, the official CMR 2022 Entity Annual Report shows a record high of 161 published articles as well as the highest number of CMR members, over 310 individuals.

Wishing the CMR great sail ahead, and continuous growth!



AUTUMN GRADUATION

Well done to our CMR student members who graduated at the 2023 Autumn Graduation ceremony! We congratulate you, your supervisors and mentors, families and support structures.

The CMR congratulates the following student members on this fantastic achievement:

Bachelor of Science (Honours):

Zoology

- Margaretha Magdalena Burger
- Dumisile Engel Mbuyazi

Master of Science (Research):

Chemical and Physical Oceanography

- Nasreen Burgher

Master of Science (Research):

Zoology

- Sarah Ann Hawkes (*Cum Laude*)
- Leigh-Ann Smit (*Cum Laude*)

Master of Science (Research): Botany

- Chuene Priscah Lakane
- Anesu Machite

Doctor of Laws: Public Law

- Rachael Sharon Chasakara

Doctor of Philosophy:

Oceanography

- Sixolile Leonora Mazwane

Doctor of Philosophy: Botany

- Lize von Staden





CMR QUARTER 2 SEMINAR

The Quarter 2 seminar took place on 18 April and was presented by Dr Heidi van Deventer on the topic *Using GIS and Earth Observation to Report Changes in Extent and Integrity of Aquatic Ecosystems Aligned with Global Biodiversity Framework Targets*. Dr van Deventer also highlighted the use of GIS and remote sensing in mapping and typing of Inland Waters for South Africa, demonstrating progress and challenges with ongoing projects. This was a hybrid event with a total of 91 attendees. The recording of the talk and presentation are posted on the CMR website: <https://cmr.mandela.ac.za/News-and-Events/Quarterly-Seminars>



UNIVERSITY OF CAPE TOWN-SANCOR SEMINAR

This seminar was held at the University of Cape Town on 12 April. CMR Research Associate, Dr Olivier Bousquet, presented on *Marine animals as oceanographers: Research opportunities in the SWIO and overview of the Sea Turtles for Ocean Research and Monitoring (STORM) regional research programme*. He gave an overview of the objectives and current status of this research programme as well as to discuss potential upcoming opportunities to expand STORM (sea turtles for ocean research and monitoring) to other marine species and research areas with particular emphasis on ecological connectivity in the Mozambique Channel.

WORLD OCEANS DAY COMPETITION

To celebrate World Oceans Day on 8 June, the CMR hosted a photo competition with the theme *Conserve our Ocean for Future Generations*. Individuals were encouraged to submit two photographs: One of Hope, where you can see the effect of conservation measures in place and one of Challenges we still face. Six individuals submitted a total of 6 entries.



1st Prize

Tebatso Morena

"Early morning" & "Afternoon"

Prize: Two Discover Scuba Diving Experience Vouchers from Pro Dive



2nd Prize

Rachel Kibble

"Standing tall" & "A sore thumb"

Prize:


A2 Canvas Mounted Print from Katz Camera & Print

MANDELA ESTUARINE ECOLOGY

Professor Johan Hollander (World Maritime University, Sweden) visited the university from 7-12 May to work on, CMR student, Manuela Amone's thesis investigating *Zostera capensis* restoration and invertebrate diversity in Mozambique. Professor Janine Adams attended a workshop for the EFlows Assessment of the Pungwe River Basin which was held in Cape Town from 27-29 March. Professor Adams presented on seagrass research at the Project Seastore meeting at Stellenbosch University on 14 April. Professor Adams and CMR students, Anesu Machite and Emily Whitfield hosted a workshop with DFFE and colleagues from CSIR and the University of Pretoria to map the blue carbon ecosystems in South African estuaries and prioritising estuaries for the restoration of these ecosystems. The workshop ran from 17-19 April. As part of this project, they also had an International learning exchange on 12 May with Mexico, GIZ and DFFE which involved sharing information regarding incorporating mangroves into an ocean accounts framework.



WORLD-FIRST DIGITAL TWIN OF THE OCEAN PROJECT

A photograph of a red and white lighthouse on a rocky island. The lighthouse has a red base with a white cross-shaped window and a white upper section with a red top. In the foreground, there is a large colony of birds, likely terns, on the ground. The sky is overcast with some light clouds, and the overall scene is somewhat hazy.

Professor Mike Roberts and his team recently embarked on a research trip to gather valuable data on the ocean dynamics of the Mozambique Channel using specialized oceanographic instruments. The data collected will be utilized to verify the accuracy of the world's first digital twin of the ocean, which is currently the largest computer model of the world's oceans. This model aims to forecast the appearance of Earth's oceans until the end of the century, providing vital insights into climate change and its impact on our planet's oceans. The digital twin is an advanced simulation of the world's oceans, leveraging extensive data, cutting-edge models, and artificial intelligence to generate detailed, multi-dimensional representations of marine ecosystems. This innovative technology enables forecasting over various timeframes, ranging from seasonal predictions to multi-decade projections.



BILLIONS LOST THROUGH ORGANISED FISHERIES CRIME

According to the Financial Transparency Coalition's report, Africa is suffering a staggering annual loss of approximately US\$25 billion due to illegal, unreported, and unregulated (IUU) fishing, masterminded by organized crime syndicates. IUU fishing is responsible for nearly one-fifth of global fisheries catches, resulting in an estimated overall economic loss of US\$50 billion, positioning it as the third most lucrative natural resource crime following timber and mining. The impact is evident in South Africa, where abalone poaching alone accounts for a yearly loss of at least US\$60 million. Shockingly, since 2000, poaching syndicates have smuggled over 96 million individual abalone to Hong Kong, equivalent to nearly 15,000 illegally harvested specimens each day, as highlighted in a report by TRAFFIC. Currently, the South African Police Service is not employing the full extent of the law to combat large-scale poaching as a priority crime. Urgent changes are necessary. Investigations and charges under the Prevention of Organized Crime Act should be pursued, as it carries significantly harsher penalties compared to convictions under the Marine Living Resources Act.

MEMBERS UPDATE

OUTPUTS

CMR Honorary Professor Kerry Sink has recently published two new articles:

- *Integrated systematic planning and adaptive stakeholder process support a 10-fold increase in South Africa's Marine Protected Area estate (DOI: 10.1111/conl.12954).*
- *Iterative mapping of marine ecosystems for spatial status assessment, prioritization, and decision support (DOI: 10.3389/fevo.2023.1108118).*

As well as a YouTube video on *Deep Connections - The importance of Culturally Significant Areas in South Africa's marine space* (<https://www.youtube.com/watch?v=2fgANwAFm9I>).

SOUTH AFRICAN TURTLES

Platforms for SA turtles were recently launched:

- **Facebook:**
<https://www.facebook.com/SAturtles>
- **Instagram:**
https://www.instagram.com/sa_turtles/
- **LinkedIn:**
<https://www.linkedin.com/company/sa-turtles/>

EXPERIMENTAL RESEARCH

CMR member and postdoctoral research fellow at NRF-SAIAB, Dr Carla Edworthy, together with visiting BSc Honours student Liyabona Sofuthe from the University of Fort Hare, recently conducted experimental research at the Ocean Science Campus facility. Their experiment looked at the impact of coastal acidification scenarios (lowered seawater pH) on the cape sea urchin (*Parechinus angulosus*) under controlled laboratory conditions. To achieve this, they artificially spawned wild caught sea urchins, collected at a nearby site in Algoa Bay, and exposed the larvae to control (8.0 pH) and low (7.3 pH) pH treatments in the laboratory and then tracked their development over two days.

Preliminary results indicate that there is likely a significant negative impact of low pH on this species' early development, which has ecological relevance as this species of sea urchin is known to provide as a refuge for juveniles of the critically endangered abalone (*Haliotis midae*).



ORCA PREDATION IN ALGOA BAY

During a recent cruise to Bird Island, Raggy Charters came across the unexpected. While approaching a pod of 3000 common dolphins, they spotted a pod of about 12 Orcas. They appeared to be in hunting mode, spread out and moving fast. Then they disappeared, after about 5 minutes evidence of a kill emerged at the surface. It was not evident what was predated, however, Mr Lloyd Edwards assumed that it was either a large shark or a deep diving cetacean. He had experienced this similar underwater predation behavior on numerous occasions while he was at Bremer Canyon, off the coast of South Western Australia on a two-week research trip. Once the Orcas had satisfied their hunger, it was playtime, which is beautifully captured in the images below.



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All messages to the CMR should now be directed to the CMR's dedicated cmr@mandela.ac.za email address. All CMR registered Research Associates and Professors who require admin support should also direct their queries to cmr@mandela.ac.za.



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