

NELSON MANDELA
UNIVERSITY

INSTITUTE FOR COASTAL AND
MARINE RESEARCH (CMR)

2024 RESEARCH SYMPOSIUM



*From Research to
Action: Addressing
Coastal and Marine
Challenges in Policy
and Society*

FRIDAY
15 NOVEMBER 2024

OCEAN SCIENCES CAMPUS,
CONFERENCE HALL

CMR
COASTAL & MARINE
RESEARCH

Time	Item
09:00-09:20	Professor Azwinndini Muronga Welcoming Address
09:20-09:45	Dr Palesa Mothapo Research Support & Management
09:45-10:10	Mr Andrew Young From Research to Action: Addressing Coastal and Marine Challenges Using Marine Robotics
10:10-10:35	Ms Nozipho Boo Promoting Investments within Ports
10:35-11:05	COMFORT BREAK
11:05-11:30	Mr Prince Campbell Influence of Water Physicochemical Properties and Vegetation Type on the Distribution of Schistosomiasis Intermediate Host Snails in Nelson Mandela Bay
11:30-11:55	Dr Daniel Lemley Harmful Algal Blooms in South African Estuaries and Coastal Waters: From Research to Management
11:55-12:20	Dr Lucienne Human Setting up a Water Quality Monitoring Program for the Knysna Estuary: Use of LTER to Inform Estuary Management Plans
12:20-12:45	Dr Belinda Clark & Ms Therese Boule Development of a Maintenance Management Plan for the Coastal Area between the Kromme and Kabeljous beaches in the Kouga Municipality
12:45-13:45	LUNCH
13:45-14:10	Dr Ntemesha Maseka The Long Arm of the Law: Applying the South African Constitution to Corporations at Sea
14:10-14:35	Dr Buhle Francis Application of a Human Rights-Based Approach to Navigate Conflict in Small-Scale Fisheries: A Case Study of 15 Cooperatives in the Eastern Cape, South Africa
14:35-15:00	Dr Zanele Hartmann & Dr Jessica Leigh Thornton Sustainability, Well-Being and Health: Towards a Cultural Metric Approach in Ocean Accounting
15:00-16:00	Dr Denise Schael CMR, Year in Review and Going Forward Thanks, and Closure
16:00-17:00	COCKTAIL HOUR

RSVP: <https://forms.office.com/r/9Mfkf0jUSm>
by 12:00 on 11 November 2024

09:45 - SPEAKER 1

Mr Andrew Young

From Research to Action: Addressing Coastal and Marine Challenges Using Marine Robotics



The Marine Robotics Unit (MRU), at the Nelson Mandela University was established by identifying a number of key projects and utilising the existing research and development structure within eNtsa for creating a development and research orientated critical mass of research-based projects. The MRU aims to develop the skills and support to control, monitor and maintain autonomous vessels and their associated infrastructure. The MRU assets will form the platform to enable oceanographers and scientists to gather data on our coastal biodiversity and can also provide machine learning capability through the development of intelligent systems and the opportunities provided by 4IR. The MRU will create a learning experience through the development of platforms and sensors, the development of guidance systems with interactive feedback and the development of techniques for modelling the behaviour of autonomous systems (AI). Robotic systems promise to open the ocean to humans in new ways. Recent advances in robotics are improving efficiency, lowering costs, and reducing the risks of marine operations.

Mr Young received a M.Tech in Mechanical Engineering in 2000 and has 20 years of experience in innovation and the development of new technologies, products and processes. Mr Young is a known provider of reliable and actionable solutions to stakeholders in the automotive and manufacturing industries. He's main responsibilities are to direct and manage all engineering activities to ensure engineering integrity, financial sustainability, good communications and workflow.

10:10- SPEAKER 2

Ms Nozipho Booï

Promoting Investments within Ports



The study investigates the factors influencing investment attraction in South African commercial seaports. This study is motivated by the poor performance of these ports, as evidenced by the World Bank Container Index Report, which ranked them among the lowest globally. Operational inefficiencies, such as congestion leading to significant container delays, have eroded investor confidence and prompted calls for improvements. This research aims to identify the determinants of investment attraction within this context. It will examine factors like infrastructure quality, operational efficiency, regulatory environment, and their impact on attracting investments. The study will employ a mixed-methods approach, combining a literature review with primary data collection through surveys and interviews with industry stakeholders. The findings are expected to provide insights for policymakers and port authorities to enhance the attractiveness of South African ports to potential investors.

Ms Booï is currently pursuing a Doctor of Business Administration at Nelson Mandela University with ports investment attraction as her research focus. She has held positions as an Assistant Director Manufacturing and Renewable Industries at the Nelson Mandela Bay Metro, New Business Development Manager: Port of Ngqura at the National Ports Authority (TNPA) and Regional Commercial Services Manager: Central Region Ports at TNPA. Ms Booï has notable recognition as the 1st Graduate in M Phil Maritime Studies at Nelson Mandela University and the Sunday World 2021, Heroic Woman in the Sustainability Category (Maritime).

11:05 - SPEAKER 3

Mr Prince Campbell

**Influence of Water
Physicochemical Properties
and Vegetation Type on the
Distribution of
Schistosomiasis
Intermediate Host Snails in
Nelson Mandela Bay**



Schistosomiasis is an infectious water-borne disease that holds substantial medical and veterinary importance. Environmental factors such as pH, salinity, temperature, electrical conductivity, dissolved oxygen, turbidity, hardness, and total dissolved solids, as well as biological factors, food availability, and density of aquatic vegetation play a crucial role in the spread of the disease, as the survival of intermediate host snails is dependent on them. The study sought to assess the impact of water physicochemical properties and vegetation type on the distribution and habitat preference of schistosomiasis intermediate host snails within Nelson Mandela Bay. A quantitative cross-sectional research design was used to collect samples in eight waterbodies near residential areas over a nine-month period.

Mr Prince Campbell completed his MSc Environmental Health in 2024 from the Nelson Mandela University. Prince is an aspiring researcher with interests in Environmental Epidemiology, Neglected Tropical Diseases and Health education and promotion. He is currently a lecturing assistant at the Nelson Mandela University, Department of Environmental Health and a research project administrator for a project under the Water Research Commission (South Africa). Prince was accepted for his PhD programme and will be commencing with the programme in 2025.

11:30 - SPEAKER 4

Dr Daniel Lemley

Harmful Algal Blooms in South African Estuaries and Coastal Waters: From Research to Management



Over recent decades the frequency, magnitude, and extent of harmful algal blooms (HABs) have increased globally in estuarine and coastal waters. The primary concern arising from such HAB events is founded in the array of possible consequences, including extreme oxygen fluctuations, direct and indirect effects on higher trophic levels, and habitat destruction through shading of submerged aquatic vegetation. The aim of this talk is to showcase examples of various HAB species documented in South African estuarine and coastal waters, and to delve into the drivers and mechanisms associated with their occurrence. Research efforts of this nature are pertinent given that the health of most of South Africa's 290 estuaries is deteriorating. Yet, despite half of the country's estuaries being affected by nutrient pollution and fish kills being observed in 13% of these, only a handful of estuaries have records of HABs. As such, there has been a shift towards focusing research efforts on this topic over the last decade. This talk will also demonstrate how the information gathered through these research efforts has been used to inform management interventions and cooperative governance initiatives.

Dr Lemley's research is focused on the protection and sustainable management of aquatic ecosystems, particularly regarding estuarine and coastal water quality issues. He is at the forefront of harmful algal bloom research in South Africa and has developed a network with local and global collaborators on this topic. His research efforts provide useful insight to management authorities on how best to manage these unique systems.

11:55 - SPEAKER 5

Dr Lucienne Human

Setting up a Water Quality Monitoring Program for the Knysna Estuary: Use of LTER to Inform Estuary Management Plans



Deterioration of water quality in the Knysna Estuary because of increased urban development is threatening its invaluable ecosystems and its benefits to society, such as biodiversity of national importance, recreation and tourism, and subsistence use. Major pollution threats to the Knysna Estuary include high suspended solid loads (e.g., from river inflows and stormwater discharges), nutrient enrichment (e.g., from WWTWs), microbiological contamination (e.g., from stormwater discharges and WWTWs), and solid waste (e.g., from stormwater discharges). A detailed survey was used to develop a guideline for water quality monitoring and reporting for the South African National Parks (SANParks) who are the management authority for the system. Beside various targeted sampling campaigns, LTER data from 2021 to 2023 underpinned the state of water quality in the estuary.

Dr Human is a marine and coastal biogeochemist with an interest in estuarine ecology. His research focuses on eutrophication and its impact on estuarine water quality. Having a firm grounding in estuarine botany, he has always had a keen interest in the role that primary producers (seagrass, salt marsh) play in biogeochemistry and in mitigating pollution such as heavy metals and persistent organic pollutants. Recently his focus has been on the importance of these habitats as Blue Carbon Sinks for climate change mitigation.

12:20 - SPEAKER 6

**Dr Belinda Clark &
Ms Therese Boulle**

**Development of a
Maintenance Management
Plan for the Coastal Area
between the Kromme and
Kabeljous beaches in the
Kouga Municipality**



Development along the coastal area between the Kabeljous and Kromme beaches has taken place in a dynamic area; where physical forces of wind, waves, and currents drive the form and function of the coastal environment. Development in dynamic areas disrupts and modifies the 'natural' coastal processes. Typical problems that require ongoing management and maintenance are sand inundation of landward structures and infrastructure, coastal erosion and undercutting of seaside properties, access issues, pollution, etc. A Basic Assessment process was commissioned to inform a Maintenance Management Plan that will allow the Municipality to undertake their work in the coastal area. The presentation will provide an overview of the regulatory process and illustrate what informs the assessment process that is used to make management recommendations.

For the past 19 years, Dr Clark has worked in the environmental management field on various projects across South Africa. Over the last two years, she has expanded her work into climate change and climate resilient development planning. Ms Boulle has a wealth of experience in managing programmes and facilitating processes in public health and the environment. More recently she has been working on climate change programmes in the Eastern Cape applying the climate resilient development pathways approach.

13:45 - SPEAKER 7

Dr Ntemesha Maseka

The Long Arm of the Law: Applying the South African Constitution to Corporations at Sea



With its vast resources, the ocean is increasingly viewed as a new economic frontier, offering opportunities for economic growth, job creation and innovation. Corporations, with their significant resources, play a central role in driving this “blue economy” through activities like offshore oil and gas exploration and exploitation. However, while their activities promise economic benefits, they also pose substantial risks to the marine environment. This harm to the marine environment often threatens the livelihoods, health, culture and traditions of coastal communities that rely on the ocean. In South Africa, these tensions are especially evident within Operation Phakisa, a government initiative designed to unlock the ocean’s economic potential to address poverty, unemployment and inequality. This presentation illustrates that the race to exploit ocean resources does not occur in a human rights vacuum. Under the South African Constitution, corporations operating at sea are, in specific circumstances, subject to human rights obligations. The presentation will explore the legal implications for both the State and non-State actors, examining how constitutional human rights protections extend to corporate activities at sea.

Dr Ntemesha Maseka is a Postdoctoral Research Fellow under the South African Research Chair in the Law of the Sea and Development in Africa. Her research focuses on the intersection of the law of the sea and human rights law, particularly in the African context. She is especially interested in the accountability of non-State actors, such as corporations, for human rights abuses at sea.

Dr Buhle Francis

Application of a Human Rights-Based Approach to Navigate Conflict in Small-Scale Fisheries: A Case Study of 15 Cooperatives in the Eastern Cape, South Africa



In 2018/19, the South African government granted fishing rights to small-scale fisheries (SSF) sector, to promote the livelihoods and social justice of the coastal communities. For the SSF sector, to exercise their right, they found themselves grouped into cooperatives. While these cooperatives begin to exercise their rights, they encounter significant conflicts that threaten their effectiveness. This research employs a Human Rights-Based Approach to examine the underlying dynamics of these conflicts in the Eastern Cape. We purposively selected 15 SSF cooperatives based on their proximity to us, established trust, and relationships of many years. Through focused group discussions, individual interviews, and workshops with over 50 fisher leaders and members, we analysed the barriers they face.

Dr Buhle Francis is a Senior Researcher at the Centre for Integrated Post-School Education and Training, Nelson Mandela University. Her research is at the nexus of scientific inquiry and community engagement where she specialises in the intricate dynamics of small-scale fisheries. Through a multidisciplinary approach, her research navigates the complex realms of ocean governance, social justice, policy, gender, livelihoods, and climate change impacts within these vital ecosystems. Central to her work is the illumination of challenges in the small-scale fishing sector where she shades light on often-overlooked experiences, especially those vulnerable groups. Her research ethos is characterised by its active and collaborative nature, fostering partnerships and dialogue to address injustices through diverse perspectives and insights.

14:35 - SPEAKER 9

**Dr Zanele Hartmann &
Dr Jessica Leigh
Thornton**

Sustainability, Well-Being and Health: Towards a Cultural Metric Approach in Ocean Accounting



The sea embodies meaning, healing, and identity, expressed through interactions and customs closely intertwined with cultural heritage. There are three perspectives through which health is related to heritage. However, the complexity of cultural ocean interactions is absent in current ocean accounts frameworks. We posit that well-being is not linear but sensory, complex, and intricate. By considering a cultural metric in an ocean accounts framework, we can see that there is a potential to revalorise intangible cultural knowledge for ocean sustainability. Using an explorative and qualitative approach along the coast from Knysna to Port Alfred, data was collected to understand the lived experiences of people using the ocean for either cognitive or physiological needs.

Dr Hartmann specialises in social-ecological systems (SES) approaches to marine governance. Her research interests include human-nature interconnections, equitable knowledge sharing, co-creation of knowledge, and transdisciplinary research. Dr Thornton is a research anthropologist investigating the anthropological subject of food heritage and the various flows of food culture that present themselves as foodways in culture. She was also a post-doctoral grantee of the National Institute for Humanities and Social Sciences at the University of Pretoria and at Nelson Mandela University.