



CONFERENCE PROGRAMME

Sustainable horizons – Navigating the future with environmental innovation

11–12 October 2024

Centenary complex, University of the Free State, Bloemfontein, South Africa

Friday, 11 October 2024

08:00	<i>Arrival and registration</i>	
	Opening session (Main Hall) Chairperson: Prof Olusola Ololade	
09:00	Official opening and welcoming – Acting AHD of the Centre for Environmental Management (CEM) - Prof Olusola Ololade	
09:05	Message from the Dean: Natural and Agricultural Science – Prof Paul Oberholster	
09:15	A reflection on 30 years of excellence – former Director of CEM, Prof Maitland Seaman	
09:35	Keynote address: Prof Nick King <i>Environmental Triumphs & Challenges – looking back, looking forward, in southern Africa and beyond</i>	
10:10	Invited speaker: Prof Lochner Marais <i>Critical perspectives on governing the environment and beyond</i>	
10:30	Tea break	
	Session 1: Policy and governance for ensuring a sustainable future	
11:00	Invited speaker: Dr Gabriel Ngorima <i>The role of sustainability reporting in promoting sustainable business practices in South Africa. Are we winning?</i>	
	Governance 1 Venue: Main Hall Chairperson: Prof Kumarasamy	Governance 2 Venue: Chancellors Room Chairperson: Dr Adu
11:30	Air quality offsets – A get out of jail free card or a cost-effective solution to one of South Africa’s most intractable environmental problems? – Sean O’Beirne	Using macroinvertebrates to unravel the monitoring requirements of natural to near-natural river systems – Hendrik Sithole
11:45	Re-imagining the potential of constructed wetlands as a sustainable solution for mining pit lake closures – Hans Kgasago	The slow pace of rehabilitation of unrehabilitated mined lands in South Africa: The case of Gauteng Province – Lufuno Nemathaga
12:00	The impact of water allocation control measures on overallocation of groundwater resource in karst aquifers: A case study of the Wonderfonteinspruit Catchment in the Vaal Water Management Area – Chuene Chokoe	The Evidence-Based model and public policy making in South Africa – Dr Sibusiso Xaba

12:15	Development and application of a mathematical model for simulating fate and transport of nutrient pollutants along the msunduzi river – Prof Muthukrishna Kumarasamy	Optimizing water quality indexing using the adaptive neuro-fuzzy inference system for cost-effective enhanced monitoring and pollution control – Dr Joy Adu
Poster presentations (Main Hall) Chairperson: Dr Gladys Belle		
12:30	Using DN-PMF as a sensitivity test for conventional PMF analysis at three towns in South Africa, 2017 - 2018 – Dr Chantelle Howlett-Downing	
12:35	Application of the integrated wastewater resource recovery model: A case at the Burgersfort WWTF – Sekato Maremane	
12:40	Assessment of Abattoir Wastewater Purification Potential of Chitosan Crosslinked Biopolymer from Shrimp Shell Waste for Domestic and Commercial Use – Dr Ernestine Atangana	
12:45	Modelling convective-diffusive of chemicals carried by groundwater – Palesa Mohajane	
12:50	Utilising GIS for Spatial Screening in Renewable Energy Planning: A Study of PV Solar Power projects in South Africa – Siyongamele Dzingwa	
13:00	Lunch break	
Session 2: Sustainable innovations to address current environmental challenges		
14:00	Invited speaker: Ashwin Seetal <i>Innovation: The intelligence of systems</i>	
	Innovation 1 Venue: Main Hall Chairperson: Dr Nola Redelinghuys	Innovation 2 Venue: Chancellors Room Chairperson: Dr Surina Esterhuysen
14:30	Seasonal variations in productivity of sown pasture covers of rehabilitated surface coal mined land: An attempt to understand future co-existence of mining and agriculture in South Africa – Dr Emmanuel Cele	Occurrence of selected Covid-19 drugs in water and sediment in the Upper Orange River basin – Dr Gladys Belle & Prof Brenda Moodley
14:45	Agricultural waste management using bio-based technologies approach – Dr Althea Grundling	Modelling groundwater recharge in a dual media aquifer system – Tlotliso Nape
15:00	Modern technological approaches to predator management for improved livestock protection and environmental monitoring – Dr Beanelri Janecke	Assessing the Feasibility of Using Phytoremediation Technologies: A Case Study of Two Wastewater Treatment Plants in Mpumalanga Province, South Africa – Koena Mabitsela
15:15	Drought impact on the vegetation of southern Kalahari: implications and mitigation of future impacts in the face of climatic changes – Dr Marnus Smit	The occurrence of potentially harmful elements in gold mine tailings and their possible impacts on the environment and public health with reference to the Welkom goldfields in South Africa - A review – Rinae Makhadi
15:30	Comfort break (15 min)	

15:45	Applying the Forchheimer equation to model an artificially recharged fractured aquifer: A case study of the Windhoek aquifer – Asteria-Lea Mwetulundila	Citizen science in education: An opportunity for improved water quality in South African rivers? – Vanessa Stippel
16:00	University students’ knowledge, awareness, perceptions and practices of environmentally sustainable menstrual hygiene products – Dr Nola Redelinghuys	Investigation of possible effect of cemeteries on groundwater – Bomkasi Vava
16:15		The application of ecohydrology techniques in defining wetland functioning planning: where science meets regulations – Dr Piet-Louis Grundling
Poster Presentations (Main Hall) Dr Ernestine Atangana		
16:30	Modeling convective dissolution of Carbon dioxide and finger development with the exponential decay and power laws – Mathapelo Kholotsa	
16:35	Mathematical Model for Conversion of Groundwater Flow from Confined to Unconfined Aquifers with Power Law Processes – Dr Makosha Morakaladi	
16:40	A Multispectral Approach for Structurally Controlled Groundwater Exploration and Management in the Main Karoo Basin: Integrating Spectral Indices and Machine Learning Models – Samkelo Rabebe	
16:45	The role of plant breeding in sustainable food production under the threat of climate change – Dr Kwame Shamuyarira	
16:50	Using less toxic pesticides to mitigate the environmental effects of pesticides in South Africa – Nonhlahla Radebe	
16:55	Measuring the performance of fat, oil, and grease removal from wastewater by pre-treatment facilities of food outlet services in Rustenburg – Cebisa Mahlangeni	
17:05	Group photo in front of the Centenary Hall	
18h00 for 18h30	Cocktail function and show at the Planetarium, Naval Hill	

Saturday, 12 October 2024

08:00	<i>Arrival and registration</i>	
Session 3: Data horizons: Using artificial intelligence, big data and analytics in environmental management Chairperson: Dr Marinda Avenant		
	Invited Speaker: Prof Susan Brokensha	
08:30	<i>Responsible use of artificial intelligence in environmental management ecosystems: A relational ethics of care</i>	
09:00	The use of Unmanned Aerial Vehicle (UAV) surveys to inform hydraulic modelling for E-flow assessments – Dr Udhav Maharaj	

09:15	Application of hydrogeophysical techniques in delineating aquifers to enhancing recharge potential areas in groundwater-dependent systems, Northern Cape, South Africa – Dr Harrison Pienaar
09:30	Investigation and improvement of joint probability modelling of flood variables for the design of flood hydrographs in South Africa – Sandile Dladla
09:45	Water Demands, Infrastructure Development, and Ingenuity in Responding to the Changing Water Quality of the Vaal River – Martin Ginster

Campus Walking Tour

Tour guide: Kobus du Preez

10:00	Join us for a walking tour starting at the Centenary complex. We will past the Biology building where the CEM was initially established, take the scenic route over the Thakaneg Bridge, past the SASOL library, modular labs, new hostels to the unique solar farm. On return, we will visit the CEM's current home in the newly renovated Agriculture building, explore the new laboratories at the CEM, and conclude back to the Centenary Complex.
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(Refreshments will be served during the campus tour)

Session 3: Data horizons: Using artificial intelligence, big data and analytics in environmental management (continue)

Chairperson: Dr Anton Lukas

12:00	Modelling Reactive Pollutant Transport in Sensitive Ecologies: The case of two species in Groundwater – Dr Hans Tah Mbah
12:15	Deriving dike-induced aquifer models from high-resolution multi-spectral satellite imagery: a novel groundwater exploration approach for arid regions – Samkele Radebe
12:30	Can the 4th Industrial Revolution stop the 6th Mass Extinction – Sean O'Beirne
12:45	Long-term biosolids use in agricultural lands in a circular economy model: Effects on selected chemical properties and the fate of triclosan and sulfamethoxazole – Prof Eyob Tesfamariam
13:00	The threat of mining to transboundary water resources – Dr Anton Lukas

13:15 Comfort break and handing out of brownbag lunches

Panel discussion

Exploring Sustainable Futures: A 30-Year Outlook

This theme will focus on the future of sustainable resource management and its role in enhancing environmental protection in South Africa and across the African continent.

Panellists:

13:30	Prof Muthukrishna Vellaisamy Kumarasamy (University of KwaZulu-Natal) Prof Nnamdi Nwulu (University of Johannesburg) Prof Lochner Marais (University of the Free State) Prof Susan Brokensha (University of the Free State) Mr Sean O'Beirne (SE Solutions – Strategic Environmental Management Consulting)
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15:00 Conference awards and lucky draw!

Please complete the conference evaluation during the concluding remarks and closing session

