



ENVIRA

Unit for Environmental Sciences and Management



UESM Newsletter

Autumn Edition 2024





ENVIRA

Interactive Buttons



Stay Informed

Announcements

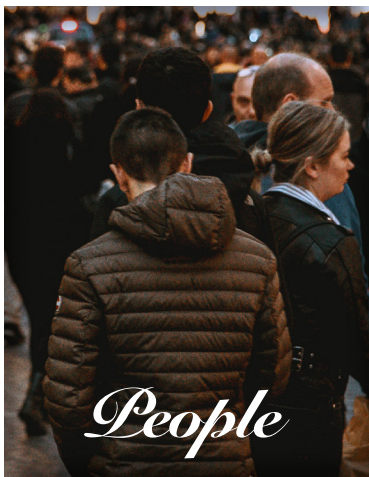
Ethics

Accolades

Calliper



Academic Performance



People

Interview:
Ms Kobie Fourie

Community Engagement

Research Group
Showcase

Student Association:
FNAS Chapter



Facilities

UESM Environmental
Chemistry Facility, G23



Research Articles

Homes as biodiversity hotspots

Scarce Skills make the mercury rise

Concerning levels of contaminants in Lake
Victoria

New book in Springer: Polystomatid Flatworms

Another day, another fire: Is climate to blame?

Old Mutual and Disaster Risk Reduction Toolkit

New species of bushveld arums discovered



*For the
sun of it*

Fact Box

Photography
Competition

- SAIAB and Annual Student Symposium
- Combined Congress 2024
- Disaster Management at the Vredefort Dome
- 49th SAAB Conference
- Pollination Symposium, Kirstenbosch
- Uniting for Climate Action: COP28
- Leuven it up in Belgium



Reflections

Editorial

Hello, March! With autumn upon us and temperatures gradually dipping, we brace for the impending winter. But, before we enter the frigid season, we have a few more warm days ahead and an array of interesting topics to discover in the Autumn edition of ENVIRA.

Here follows a tidbit of what to expect in this edition:

Celebrate the latest achievements of staff and students in the UESM, followed by a personal interview featuring Ms Kobie Fourie. She's the driving force behind administrative tasks in the School of Geo- and Spatial Sciences, and the right hand to Prof. Stuart Piketh, the School's director.

The UESM has further been active within the community and their respective research groups whilst collaborating with local and international peers. Curious about activities at the new building, G23? Gain some insight into the UESM's new chemical preparation and analytical facilities. Finally, reflect on various conferences and international travels as well as the latest research conducted by our researchers.

We encourage you to share your hobbies and extramural activities as well as photography / videography contributions. The ENVIRA Photography Competition submissions are open year-round until October. Also, take note of our next article submission deadline in the announcements.

We would like to leave you with the following quote as a reminder to be true to yourself, follow your unique path and make every moment count.

*“Autumn leaves don't fall, they fly.
They take their time and wander on
this, their only chance to soar.”*

Delia Owens, *Where the Crawdads sing*

Clarissa Coetzee (Editor) and Frances Siebert (Sub-editor)

LATEST ANNOUNCEMENTS

IMPORTANT DATES!!

Next ENVIRA article submission date:

6 May 2024

[Author Guidelines](#)

PHOTOGRAPHY COMPETITION

ENVIRA Photography Competition 2024
Take your best shot!!

Entry deadline:

October 2024

View [more information](#).

View all photographs and videos for [ENVIRA Photography Competition 2023](#).



UESM TALKS

This initiative was started by Prof. Frank Neumann as a great way to further showcase the research in- and collaborations with our unit.

Any interesting, applied research topics are welcome. Presenters can contact:

Frank.Neumann@nwu.ac.za



CLICK HERE

ACADEMIC RECOGNITION FUNCTION

The ENVIRA-UESM Academic Recognition Function successfully took place on 17 November last year.

Have you seen the [photos](#) yet?



HOBBIES AND EXTRAMURAL ACTIVITIES

Share your hobbies, passions and means of relaxation outside of the university's daily hustle and bustle. Whether it's your latest adventures during the holidays/weekends, or within university context, we look forward to showcasing your experiences.

[Submit here](#)



REGULAR ANNOUNCEMENTS

COMMUNICATE YOUR NEWS

Corporate Communication is requesting your news

Share your newsworthy events, achievements (staff and students), projects, community engagement research, teaching-learning breakthroughs, or any relevant news that may position the NWU. These news items are used on various internal and external university platforms and are also made available to the media.

Complete this [template](#) and submit it to louis.jacobs@nwu.ac.za.

Academics are also encouraged to submit opinion pieces to Corporate Communications whereby these pieces will be directed to the appropriate media houses.

UESM: eFUNDI FORMS

Get all the admin forms here - UESM One-Stop Source

Did you know that all the latest procedures and documents for UESM staff and students are uploaded onto a single eFundi page?

Click [here](#) to visit the UESM eFundi portal.

CAMPUS TREE ROUTE

Stretch your legs, go outside and explore campus on the 2 km Tree Route.

Important information:

- Full length [article](#) on the tree route (as seen in the [ENVIRA Autumn Edition 2022](#))
- [Species List](#) & [Map](#)

ARE YOUR DETAILS CORRECT?

The UESM Website is regularly updated.

Please check your details on the staff page.

If you are a senior member or the head of a sub-programme or research group, please also visit the website and make sure the content is correct and up to date.

Contact Clarissa Coetzee at Clarissa.Coetzee@nwu.ac.za for any necessary amendments.

Have you followed the UESM on social media yet? Here are the links:



ETHICS

Visit the [FNAS eFundi link](#) for a detailed summary of the ethics process.

If you do not have access to the page view the guide [here](#).

For any queries or assistance, please contact:

Prof. Nomali Ngobese: Nomali.Ngobese@nwu.ac.za

Prof. Roelof Burger: Roelof.Burger@nwu.ac.za

Ms Madelien Burgers: Madelien.Burgers@nwu.ac.za

More information on Ethics [here](#).

CHANGE YOUR AFFILIATION TO UESM ON RESEARCH GATE

Log on to your Research Gate 'profile' page. This is the page with your name, photo and other info. On the right there is a box with the heading 'Current Affiliation'. If under 'Department' it states 'Unit for Environmental Sciences and Management' you have nothing further to do. If anything else, click on 'edit' to the right of 'Current Affiliation' and then 'Edit Current Affiliation'. Under 'Department' scroll and choose 'Unit for Environmental Sciences and Management'. Do not copy and paste, just start typing and it will appear. Right at the bottom click 'Save'.

Welcome to one of the most active, dynamic and productive research communities of the NWU!

The latest from FNASREC

Roelof Burger & Madelien Burgers

The current NWU policy requires all research to be subjected to independent ethics review. This includes all MSc and PhD student research and any funded or unfunded research undertaken by staff and postdoctoral associates.

No research is allowed to start without an ethics number as proof of the ethics review. The responsibility of the ethics review lies with the principal investigator or the primary supervisor of the student.

The FNAS Research Ethics Committee (FNASREC) deals with all research in the Faculty of Natural and Agricultural Sciences with zero or low risk where the research topics do not fall in the scope of one of the other committees, including HREC, Animcare, and Animprod.

Click [here](#) for more on the dates, procedures, forms and information to obtain ethics approval described on the FNASREC page.

(Having trouble accessing the page? Follow this [link](#))

If you are interested in contributing towards ethics in FNAS, contact:



Ethics Chairperson
Prof. Nomali Ngobese:
Nomali.Ngobese@nwu.ac.za



Ms Madelien Burgers:
Madelien.Burgers@nwu.ac.za



Prof. Roelof Burger:
Roelof.Burger@nwu.ac.za

FNASREC dates in 2024

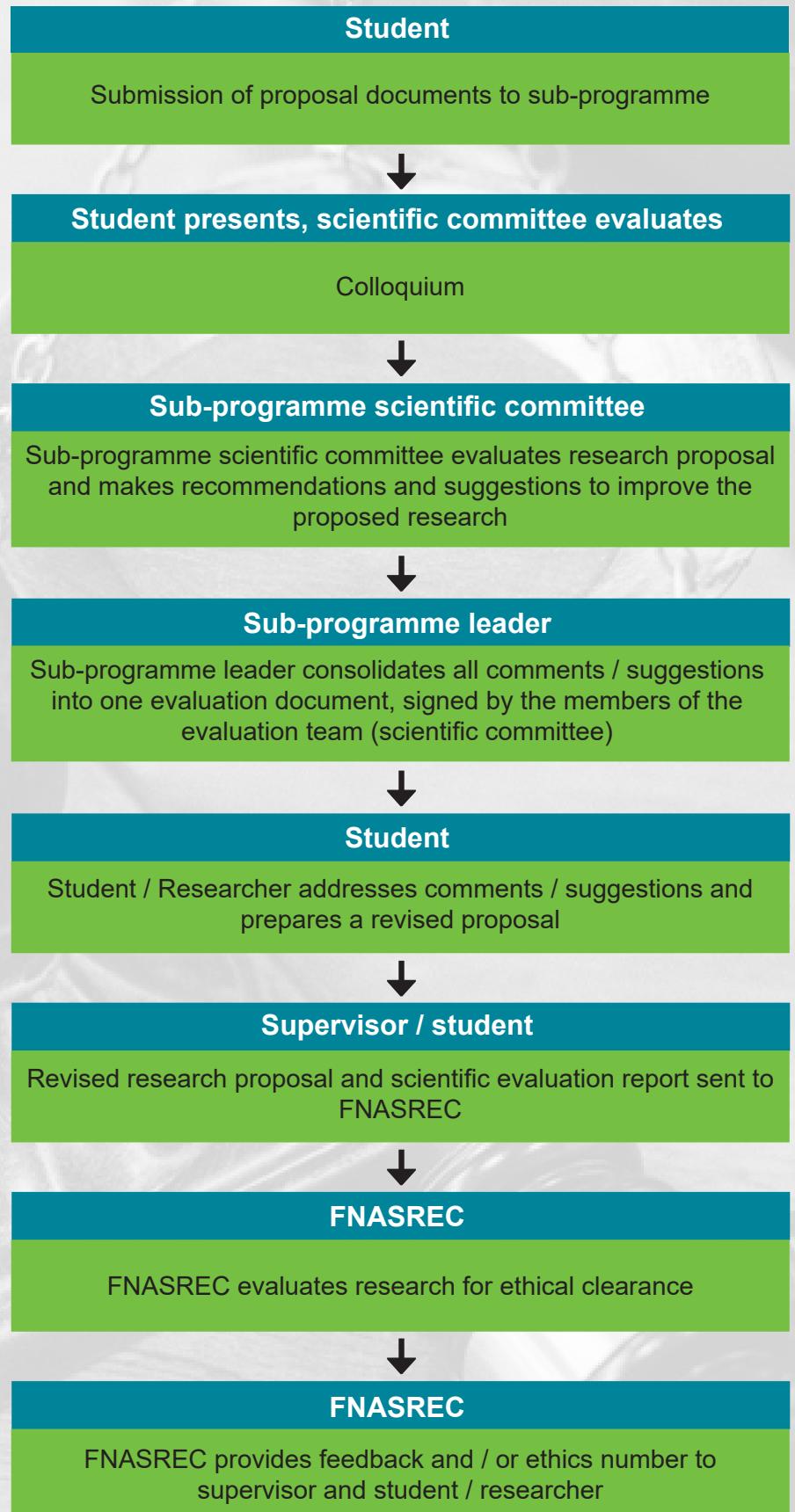
<u>Agenda Closure</u>	<u>Meetings</u>
22 March	28 March
12 April	18 April
17 May	23 May
14 June	20 June
12 July	18 July
16 August	22 August
13 September	19 September
18 October	24 October
15 November	21 November

See the full ethics process on the next page.

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The Ethics process:



Louis H. du Preez
Willem J. Landman
Olivier Verneau

Polystomatid Flatworms

State of Knowledge and Future Trends

Polystomatid flatworms - book cover.

Congratulations

The following awards and accolades demonstrate the high quality and significant impact of research within the UESM.

Prof. Louis fu Preez, Mr Willie Landman & Prof. Olivier Verneau - Book release

Congratulations to Prof. Louis du Preez, Mr Willie Landman and extraordinary appointee Prof. Olivier Verneau from France, on the book "Polystomatid Flatworms: State of Knowledge and Future Trends" that was published as part of the Springer Zoological Monographs series.

Read more about the book [here](#).

Prof. Stefan Siebert – Medal for Botany

The Medal for Botany of the South African Association of Botanists (SAAB) is awarded by the association to recognize an individual's contributions to the advancement of botany in South Africa. During the 49th SAAB conference (see [Reflections section](#)), this prestigious award was presented to Prof. Stefan Siebert to acknowledge his significant contributions. The medal has been awarded 43 times in the 50-year history of SAAB. The conference was held at the University of Zululand in Richards Bay from 7 to 12 January 2024, and was well attended by almost 240 of its approximately 420 members.

Ms Tshepiso Tsime – Best poster for Systematics/Taxonomy

Ms Tshepiso Tsime (MSc student from the Mahikeng campus, supervised by Drs Madeleen Struwig and Tshogofatso Dikobe and Prof. Jacques Berner,) won the prize for the best poster in systematics/taxonomy at the 49th Conference of the South African Association of Botanists (see [Reflections section](#)) in Richards Bay campus from 7 to 11 January 2024. Her poster was titled "Morphological characterization of *Amaranthus palmeri* invading agricultural land in the Potchefstroom area, South Africa".

Prof. Nishanta Rajakaruna – Fulbright Ambassador

Prof. Nishi, from the California Polytechnic State University (Cal Poly), San Luis Obispo (USA), is an extra-ordinary professor in the UESM. He visited the NWU for 10 months after being awarded a Fulbright scholarship (see [ENVIRA Autumn Edition 2022](#) and [ENVIRA Winter Edition 2023](#)). He has recently been recognised as a [Fulbright ambassador](#).

As Faculty of Natural and Agricultural Sciences staff members, you are welcome to contact Prof. Nishi if interested in applying for a Fulbright scholarship.

View [link](#) for opportunities for non-US citizens.



Prof. Stefan Siebert at the SAAB medal ceremony (A). A protea is depicted on the front of the medal and a chlorophyll molecule on the back (B).



Ms Tshepiso Tsime (second from the right) awarded with a certificate by the organizing committee.



Ms Chandra le Roux.

Ms Chandra le Roux - Best MSc presentation

During the annual [SAIAB Student Symposium](#) (see [Reflections section](#)), held on 24 November 2023 at the Amazwi South African Museum of Literature, Makhanda, Chandra le Roux was awarded for the Best MSc Presentation. Her talk, "[Morphological and molecular characterisation of four new species of *Trypanosoma* from fishes of the South Coast of South Africa](#)" took the audience on a journey of discovering the vast diversity of blood parasites in our coastal fishes. This work represents a chapter of her master's study that also investigates the blood parasites of freshwater fish in South Africa's rivers. She is supervised by Prof. Nico J Smit, Prof. Courtney Cook and Dr Marliese Truter.

[Youtube link](#) to recorded presentation (start at 53min 30sec).

Prof. Gerhard du Preez & Mr Marais Cloete - Combined Congress 2024

Combined Congress 2024 (see [Reflections section](#)) was held at the Wilderness Hotel and Resort from the 22nd to the 25th of January 2024. It is hosted annually by the Soil Science Society of South Africa (SSSSA), the South African Society of Crop Production (SASCP), and the South African Society for Horticulture Sciences (SASHS). The SSSSA awarded Prof. Gerhard du Preez for the Best Paper by an author older than 30 for his paper, titled "Short-term effects of Conservation Agriculture on Soil Health Dynamics: A multi-year study in Ottosdal, South Africa". Mr Marais Cloete (former NWU student, currently at the University of the Free State) was awarded the SASCP President's Award for the Best Poster Presentation on research done for his fourth year project.



Prof. Gerhard du Preez receives award from Prof. Eyob Tesfamariam.

Prof. Nico Smit - Appointment as an Adjunct Professor at University of Miami, USA

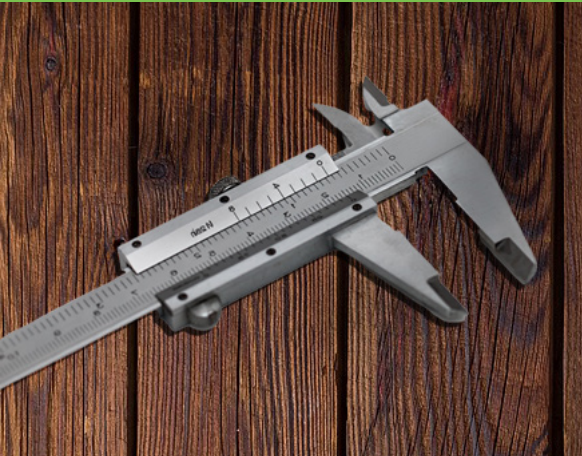
Prof. Nico Smit was appointed as an Adjunct Professor in Marine Biology and Ecology (MBE) at the Rosenstiel School of Marine, Atmospheric, and Earth Science, University of Miami, USA. His appointment was based on a nomination by one of his long term research collaborators and NWU-UESM extraordinary Professor, Prof. Paul Sikkel, the examination of his credentials, and a vote by the full MBE faculty. This is a great honour, as the Rosenstiel School of Marine, Atmospheric, and Earth Science is considered one of the Top 20 institutes in marine research in the world. It further reflects the quality of research at the NWU in the field of marine biology and ecology.



Prof. Nico Smit.



Mr Marais Cloete with his supervisor Dr Belinda Janse van Rensburg (Agricultural Research Council).



* Special mention of **Drs Kgaugelo Lekota, Henno Havenga, Anatoliy Levanets, Karen Puren, Madeleen Struwig and Deidre van Wyk** for making both top 10 lists out of 47 lecturers (excl. professors) in the Unit for Environmental Sciences and Management.

You inspire us!

How the top 10 most prolific publishers of 2023 were determined:

This list is based on the 2023 publications of UESM-affiliated lecturers as reflected by SCOPUS on 18 February 2024. All UESM lecturers were considered for this list, excluding professors, extra-ordinary appointments, postdoctoral fellows and postgraduate students.

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This list is based on the 2023 citations of UESM-affiliated lecturers as reflected by SCOPUS on 18 February 2024. All UESM lecturers were considered for this list, excluding professors, extra-ordinary appointments, postdoctoral fellows and postgraduate students.

Acronyms: AEH - Aquatic Ecosystem Health; BCE - Biodiversity and Conservation Ecology; CCAQI - Climate Change, Air Quality and Impacts; DRS - Disaster Risk Sciences; ESSOR - Earth Systems Sciences, Soils and Resources; CPSM - Crop Production and Soil Management; SPDI - Spatial Planning, Development and Implementation

UESM Lecturers Top 10: SCOPUS 2023

PUBLICATIONS

Staff member	Sub-programme	NRF-rating	Publications
Dr Kgaugelo Lekota*	BCE	unrated	8
Dr Henno Havenga*	CCAQI	unrated	5
Dr Anatoliy Levanets*	AEH	unrated	4
Mr Monray Belelie	CCAQI	unrated	2
Dr Tshegofatso Dikobe	CPSM	unrated	2
Dr Brigitte Language*	CCAQI	unrated	2
Dr Adeline Ngie	CCAQI	unrated	2
Dr Karen Puren*	SPDI	unrated	2
Dr Madeleen Struwig*	BACE	Y2	2
Dr Deidre van Wyk*	AEH	unrated	2

CITATIONS

Staff member	Sub-programme	NRF-rating	Citations
Dr Henno Havenga*	CCAQI	unrated	71
Dr Brigitte Language*	CCAQI	unrated	65
Dr Kgaugelo Lekota*	BCE	unrated	51
Dr Madeleen Struwig*	BCE	Y2	46
Dr Deidre van Wyk*	AEH	unrated	34
Dr Karen Puren*	SPDI	unrated	30
Ms Kristel Fourie	DRS	unrated	23
Mr Kailen Boodhia	AEH	unrated	23
Dr Anatoliy Levanets*	AEH	unrated	21
Dr Jaco Koch	ESSOR	unrated	20



UESM Professors Top 10: SCOPUS 2023

PUBLICATIONS

Staff member	Sub-programme	NRF-rating	Publications
Prof. Nico Smit*	AEH	B1	19
Prof. Oriel Thekisoë*	IPM	C2	17
Prof. Louis du Preez	BCE	B2	13
Prof. Rasheed Adeleke*	EIER	C2	11
Prof. Victor Wepener*	AEH	C2	11
Prof. Carlos Bezuidenhout*	AEH	C2	9
Prof. Frank Neumann	ESSSOR	C1	9
Prof. Stuart Piketh*	CCAQI	B2	8
Prof. Francois Retief	EM	B2	8
Prof. Roelof Burger	CCAQI	C3	8

* Special mention of Proffs. Nico Smit, Oriel Thekisoë, Rasheed Adeleke, Victor Wepener, Carlos Bezuidenhout and Stuart Piketh for making both top 10 lists out of 48 professors in the Unit for Environmental Sciences and Management.

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Acronyms: AEH - Aquatic Ecosystem Health; BCE - Biodiversity and Conservation Ecology; CCAQI - Climate Change, Air Quality and Impacts; EIER - Ecological Interactions and Ecosystem Resilience; EM - Environmental Management; ESSSOR - Earth Systems Sciences, Soils and Resources; IPM - Integrated Pest Management

CITATIONS

Staff member	Sub-programme	NRF-rating	Citations
Prof. Sarel Cilliers	EIER	B2	621
Prof. Rasheed Adeleke*	EIER	C2	580
Prof. Johnnie van den Berg	IPM	B1	561
Prof. Nico Smit*	AEH	B1	558
Prof. Victor Wepener*	AEH	C2	540
Prof. Stuart Piketh*	CCAQI	B2	467
Prof. Stefan Siebert	EIER	C1	442
Prof. Carlos Bezuidenhout*	AEH	C2	377
Prof. Oriel Thekisoë*	IPM	C2	356
Prof. Ché Weldon	BCE	C1	355



Ms Kobie Fourie

Senior Administrative Assistant
Geo- and Spatial Sciences

Interview by Clarissa Coetzee

General

Where did you grow up?

I grew up in Potchefstroom.

What childhood memory are you most fond of?

Riding horses, and the smell of freshly ploughed fields after it rained.

What is your favourite family tradition?

As child I always loved the big family gatherings at Christmas.

Do you have any pets? What type and what are their names?

Yes, I have two dogs, a dachshund named Rolo and a fox terrier named Aiden.

Do you have a hobby?

Yes, I love to read. I particularly favour romance novels.

What is your biggest pet peeve?

I really hate it when people drive on my car's tail.

What is one guilty pleasure you enjoy too much to give up? Coffee!

What product would you seriously stockpile if you found out they weren't going to sell it anymore?

I believe that would be sour worms.

If you won 10 million rand, how would you spend it?

Who knows? It would definitely be nice to win that amount!

What are your top three bucket list items?

1. Going to America and watching a American Quarter show;
2. Going to see the tulip festival in Amsterdam;
3. Visiting the elephant lodge at Knysna

and walking with the elephants.

What was the last song you sang out loud in your car?

Fight Song by Rachel Platten.

If you could go back in time, what advice would you give your younger self?

Cherish moments with loved ones. People are going to say "no" or reject you and it's OK.

Do you have a life motto that you strongly believe in?

Yes! Live simply, love deeply, care genuinely and speak kindly.

Career / NWU related

Where did you get your schooling?

At Hoër Volkskool in Potchefstroom.

What did you want to be when you were younger?

I wanted to become a nurse.

What other jobs did you hold before starting at the NWU?

I worked for both places, Potch Vehicle Licensing and Registration Department as well as Driver and

Favourites

Season	Autumn and Winter
Holiday destination	Overseas – Netherlands, America, and Greece
Hobby	Reading
TV show	Romances
Music genre	Country
Restaurant	I enjoy visitng any new restaurant
Dessert	Cheesecake (Lemon-Blueberry), and Carrot cake
Celebrity	Kate Middleton
Colour	Green, Blue
Sweet	Sour worms
Romcom	Letters to Juliet and The Longest Ride
Olympic sport	Equestrian jumping

This or that?

Rain or sunshine	Rain
Coffee or tea	Coffee
Book or movie	Book
Online shopping or in person	In person
Early bird or night owl	Night owl
Cat or dog	Dog, but I love cats too
Board game or card game	Board game
Indoors or outdoors	Outdoors, depending
Plans or surprises	Surprises
Sweet or savoury	Savoury
Marvel or DC	Marvel
Camping or glamping	Glamping, with no Goggos! 😊
Lose sleep or skip a meal	Lose sleep

Learner Licenses.

What do you enjoy most about working for the NWU and UESM specifically?

The best part of working here is the abundance of opportunities to constantly learn and grow. I am exposed to new challenges regularly, which help me develop both professionally and personally. Witnessing the positive impact of my work is absolutely fulfilling. I enjoy the privilege of working with talented and supportive colleagues. I also value the trust I receive from my directors and colleagues.

In your position, a fast-paced work environment is generally common. What do you feel is most helpful coping with this?

The support of the directors, colleagues and my family.

What's your go-to productivity trick?

The "Five-Minute Rule". If you can do a task in five minutes or less, do it right away instead of putting it on the back burner.

What's your best tip for staying organized?

Learn to manage your time and

prioritize.

What work related accomplishment are you most proud of?

I'm not too fond of the word "proud". Therefore, I prefer to be grateful for anything that I managed to achieve at work as well as in my personal life.

What skills do you possess that have proven most beneficial for you throughout your career?

People skills. The ability to read people and manage all kinds of situations is definitely beneficial. Being adaptable is another skill that can take you quite far.

What is your favourite memory to recall when reflecting on your time as an employee at the NWU?

The colleagues and students I got to meet and those I still get to meet on a regular basis. I learn a lot from everyone I meet and I treasure those experiences.

What do you enjoy most about the culture of the NWU, that you don't think you'd find elsewhere?

I am definitely grateful for the caring nature of my colleagues.

If you could learn one professional skill overnight, what would it be?

Language. I think it would be great to

be able to communicate better with others and to be able to do so in their mother tongue.

If you could do someone else's job for a day, who would it be?

Since it's only for one day, I would love to do Kate Middleton's job!

What is one piece of work-related advice you have never forgotten?

My mother gave me the following advice: "Never burn your bridges and always be humble". These words remain with me and I do my best to apply them as far as possible.

CRRIsP Farmers Days: A Showcase of Innovation and Collaboration in Agriculture!

Nomali Ngobese

Crop Production & Soil Management



Prof. Ngobese introducing the project to Farmers Days participants.



CRRIsP representatives from left to right: Dr Nkanyiso Malinga, Ms Nompilo Gwamanda, Prof. Nomali Ngobese and Mr Tholo Mthombeni.



Farmers Days organizers and speakers.



Farmers interacting with stakeholders at the event.

In celebration of a successful potato summer planting season, [CRRIsP](#) (Climate Resilient and Responsible Innovations in Potato) in collaboration with the KwaZulu-Natal Department of Agriculture and Rural Development ([KZNDARD](#)) and [Wesgrow Potatoes](#), wrapped up the third consecutive Farmers Days event in January 2024. This celebration marked the culmination of five research trials conducted with smallholder farmers in Swayimane and Appelsbosch, KwaZulu-Natal.

The three-day event brought together a diverse audience, including agriculture enthusiasts and industry leaders, who delivered a workshop and fostered insightful discussions poised to shape the future of farming in South Africa. Kicking off with a field demonstration of research sites, the focus was on unveiling the CRRIsP research project to farmers. The demonstration showcased agricultural practices aimed at mitigating climate change effects in smallholder settings. These Farmers Days marked the conclusion of the CRRIsP project, featuring distinguished speakers like economist Dr Sanele Gumede (University of KwaZulu-Natal) and [Consumer Scientists](#), Ms Nokubonga Nngwane and Mr Sazisa Chiya (University of Zululand), alongside [African Seeds Academy](#), [SE Holdings](#), and [Zylem SA](#) representatives.

To add to the agricultural practices demonstrated, key discussions included the importance of maintaining meticulous financial records when farmers trade their produce, with a spotlight on financial literacy as a crucial aspect of sustainable farming. Farmers were introduced to a diverse range of seed and fertilizer products to support cultivating high-quality potatoes, enhancing overall productivity and sustainability. Additionally, the event delved into packaging and processing produce, aiming to empower farmers to enhance product presentation and market value.

Despite adverse weather conditions, farmers came in numbers and the event was attended by 189 individuals. Special recognition goes to organizers, speakers, and sponsors for their dedication to supporting smallholder farmers. The Farmers Days showcased remarkable collective efforts, setting a promising tone for the future of agriculture.

*CRRIsP is a project in the [Crop Production and Soil Management sub-programme](#) of the UESM that is funded by the NRF/ERA-Net Cofund on [Food Systems and Climate](#). The project aims to address the impact of climate change on the potato sector across different agroecologies.

Life under the Microscope - Freshwater Plankton

Marliese Truter

Water Research Group (WRG)



The Nature-I-Am and UESM-WRG team that hosted the activities.



Construction of plankton nets.



Depositing collected plankton into a container and searching for larger plankton.



Life observed under the microscope.

On Saturday 10 February a group of students and researchers from the [UESM's Water Research Group \(WRG\)](#) embarked on a journey with kids of the local [Nature-I-Am at Lekwena Kids Club](#) in search of microscopic life in the freshwater bodies of the [Lekwena Wildlife Estate](#). This collaborative engagement event is aimed at sharing knowledge of the micro-universe that very few know about. It further intends to foster an interest for the environment, and install a deep appreciation for nature and its conservation among the young minds in our community.

The day started with a short story explaining what plankton is, the difference between phytoplankton and zooplankton and where we find them. Thereafter, everyone had the opportunity to make their own plankton net using a soft drink bottle, stocking and rope. The fun escalated once everyone could test their net in the pond, sort through their catch and observe them through microscopes. Some interesting finds included large aquatic invertebrates, and microscopic planktonic organisms such as copepods, diatoms, ostracods, protozoans and water fleas.

This community outreach event is the first in a series of activities by the UESM-WRG to share our knowledge and love for aquatic sciences with the children of Potchefstroom and surroundings. Watch this space for news on our next big event: [Potch Fish Day](#) as part of the celebrations of [World Fish Migration Day](#) on 25 May 2024.



Collection of plankton from a pond on Lekwena Wildlife Estate.

Planting Seeds of Curiosity: Celebrating Women and Girls in Science

Sonja de Beer & Nomali Ngobese
School of Geo- and Spatial Sciences

On the 9th of February the [NWU Science Centre](#) joined forces with [Lesego Primary School](#) in Ikageng, Potchefstroom, to craft an unforgettable celebration for the [International Day of Women and Girls in Science](#). This global event, observed annually on February 11th, is a United Nations initiative acknowledging the vital role of women and girls in science, technology, engineering, and mathematics (STEM). This year's theme, "Women and Girls in Science Leadership – a New Era for Sustainability" resonated with passion and purpose, highlighting the crucial contribution of women in achieving the three pillars of Sustainable Development, namely economic prosperity, social justice, and environmental integrity.

The NWU's UESM proudly showcased its enthusiastic women scientists: Prof. Nomali Z. Ngobese and Dr Nomfundo Sibiyi (lecturers in the [School of Geo and Spatial Sciences](#)), along with the dynamic team of master's students in the [Climatology, Air Quality, and Impacts sub-programme](#), Ms Daniella de Jager, Ms Aneska Richter, Ms Oarabile Masekwameng and Ms Sonja de Beer. From captivating lectures to thrilling hands-on experiments and eye-opening exhibitions in agriculture, climatology, chemistry, and nursing, the event aimed to illuminate the possibilities within STEM fields.

The real stars of the day were the grade 6 and 7 learners, who eagerly delved into the world of science, interacting with NWU representatives, and exploring scientific instruments. The event wasn't just about showcasing programs; it was about inspiring curiosity that could ignite an appreciation for science. The teachers from Lesego Primary School expressed their excitement about the collaborative effort between the NWU and the positive impact it would have on the students' enthusiasm for STEM subjects.

Measuring the success of such an event is no easy task. However, as the wise Dr Albert Einstein once said, "Curiosity is more important than knowledge." The UESM holds high hopes that this event planted seeds of curiosity in the minds of future scientific innovators. By fostering curiosity, events like these, contribute to cultivating the scientific minds that will undoubtedly shape the future.



The UESM ladies along with Lesego Primary School teachers.



Dr Nomfundo Sibiyi talking about her journey to becoming a scientist.



Oarabile, Aneska and Daniella representing the Climate Change, Air Quality and Impacts stall.



One-year anniversary of ESSSOR

Eugene Bergh

Earth Systems Sciences, Soils and Resources (ESSSOR)

March 2024 marks the one-year anniversary for the Earth Systems Sciences, Soils and Resources (ESSSOR) sub-programme. ESSSOR currently comprises nine members and has a focus on multi-disciplinary research in the geological and soil sciences, as well as related fields. Research themes under the ESSSOR sub-programme encompass igneous and metamorphic petrology, sedimentary processes, stratigraphy, palaeoenvironments, soil sciences, geochemistry, and mineral ore geology.

ESSSOR originated from the necessity for a suitable sub-programme to accommodate expanding research fields that fall outside of the scope of the Ecological Interactions and Ecosystem Resilience (EIER) sub-programme. It was therefore decided to establish a new sub-programme with a more focused niche for geological and soil science research within the NWU's UESM. ESSSOR maintains good collaborative relationships with the EIER, Climate Change, Air Quality and Impacts (CCAQI) and Biodiversity and Conservation Ecology (BCE) sub-programmes. Collaborations also extend to other institutions, nationally (UFS, CGS, Wits, UJ) and internationally (USA, France, Germany, UK). As part of these collaborations, Dr Eugene Bergh completed a research visit to France in July 2023 and Prof. Frank Neumann participated in a Geoarchaeology workshop in Greece. The ESSSOR team further boasts 12 national and international conference contributions and 12 peer-reviewed articles published over the past year. Publications are expected to increase in 2024, as the majority of the team is made up of young, dynamic and ambitious individuals in the process of completing their PhD degrees. ESSSOR also hosted its first colloquium where master's and honours students presented their project proposals.

Finally, ESSSOR welcomed its first postdoctoral fellow, Dr Mabrouk Bachari, in January 2024. Dr Bachari completed his collaborative PhD degree from El Manar University (Tunis) and Lorrain University (France). He has research experience in sedimentological, petrological and tectonic controls of Cretaceous deposits from North Africa. His project at the NWU will focus on palaeoenvironmental reconstruction of the Cretaceous period (>65 million years ago) along the South African margin.

We look forward to seeing what the year 2024 holds for ESSSOR and all its members.

The ESSSOR team



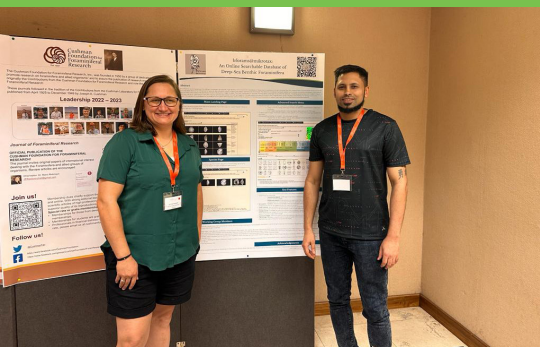
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Dr Eugene Bergh presenting his work at the FORAMS symposium in Italy.



Master's student Michael Fourie sampling in an estuary on the South Coast.



Dr Eugene Bergh with one of his collaborators from the US at a conference in Italy.



ESSSOR postdoctoral fellow, Dr Mabrouk Bachari, at a conference where he presented his work.

Promoting Balance and Inclusivity - FNAS SAC 2023/2024



Rebecca Rethabile Mantso
FNAS SAC Chairperson

I am honoured to serve as the Faculty of Natural and Agricultural Sciences' Student Academic Chapter (FNAS SAC) Chairperson for the 2023/2024 term. This year, alongside completing my 3rd year in BSc Agricultural Science with Soil Science and Agronomy, I am dedicated to excelling in my new role.

The SAC comprises a fantastic group of senior students representing the faculty student body. SAC members for this term include Liphon Madikgetla as Deputy Chairperson, Janice Saulse as Secretary, Mpho Phafoli as Academic Officer, Rowan Gakin as Sports Officer, Charlotte Moleleki as Transformation and Diversity (TAD) Officer, Bonolo Motsoaledi as Liaison Officer, Kharivieh Lesly on Media, Marketing and Recruitment, and Sbusiso Chauke as the Student RAG Community Service (SRCS) Officer.

We are committed to bridging the gap between students and lecturers. Our vision is to promote an inclusive and innovative student life within FNAS, and to maintain a balance between student academics and socialisation.

In a social context, we plan to continue hosting events such as Movie Night, Speed Dating, First Year's Picnic and Dines. To include different Schools within FNAS, we even plan and host Video Game Tournaments and Programming Competitions. In addition, we encourage student participation in various sports and collaborate with organisations such as Thuso and Salt, focusing on both physical and mental health and well-being.

Our mission is to establish a highly productive and enthusiastic academic environment and highlight student talents within our faculty. In recognition of such special talents in FNAS we host events like Debate, Spelling Bee and Market Day. On Market Day students get to showcase and sell their own arts and crafts, further highlighting student talents and hobbies and developing their entrepreneurial skills.

Since we serve a diverse group of students, our goal is to ensure that every culture feels appreciated. We make an effort to market each cultural holiday and each planned cultural event through creating posters and announcing these significant days on social media and other platforms. The SAC also raises awareness of current issues on campus and strive to aid students in finding solutions.

Proud of our uniqueness and aiming to stand out as a faculty, we work hard to produce distinctive branding on clothing items for every school within the faculty.

Our hearts and minds are set on creating a fun and memorable environment on campus whilst promoting student academics.

"Balance is not something you find; it's something you create"
Jana Kingsford



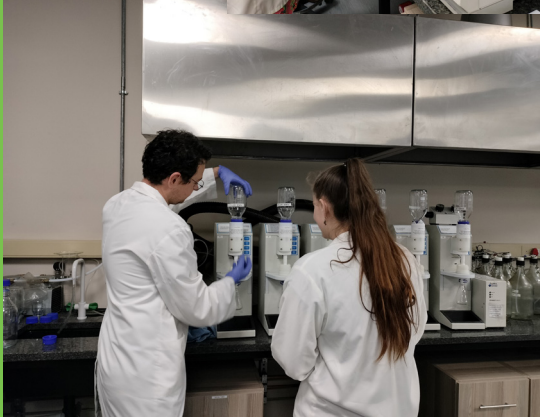
FNAS SAC engaging in- and promoting various activities.



The chemical analytical laboratory operating in full swing.



Laboratory 239 housing the LC-QTOF, GC- μ ECD, F/GF-AAS and FIMS.



Students working at various of the state-of-the-art apparatuses.

UESM Environmental Chemistry Facility

Hannes Erasmus¹ & Rialet Pieters²
¹Water Research Group (WRG); ²Envitrox

After its move to the G23A building at the end of 2023, the UESM's environmental chemistry facility is ready for research in state-of-the-art laboratories, built to international standards. Laboratories 238 and 239 house the preparation and analytical facilities, respectively. The new facility provides the UESM with the equipment to prepare samples for biological and chemical analyses to assess various pollutants and toxicants in the environment for an ecotoxicological approach. The facility houses several apparatuses to analyse both organic and inorganic compounds/pollutants extracted from several environmental matrices including water, sediment, soil, macroinvertebrates, fish, as well as parasites of fish. Examples of organic compounds that can be analysed and for which methods have been set-up, include hormones, antiretroviral medication, antibiotics, as well as organochlorine pesticides (OCPs). The instruments enabling these analyses are the quadrupole time-of-flight liquid chromatograph coupled to a mass spectrometer (LCMS-QTOF) (lovingly known as "Aggi") and a gas chromatography micro-electron capture detector (GC- μ ECD). The inorganic compounds are analysed for single and multi-element analyses on the flame and/or graphite furnace atomic absorption spectrometer (F/GF-AAS), as well as mercury on the flow injection mercury system (FIMS).

In the sample preparation laboratory, solids and liquids can be extracted with a variety of instrumentations: accelerated solvent extraction, high volume liquid extraction, and subsequent evaporation of large and not so large volumes of solvents. The freeze-dryer and acid digester each have a special spot in the laboratory too. This laboratory is also equipped with three fume hoods, as well as an extraction fan mounted above an entire work bench.

The analytical laboratory is equipped with an 80 kVA uninterrupted power supply system to ensure that the analytical equipment can run continuously, even during loadshedding schedules. This equipment has previously been used in several national and international research projects, student exchange programmes and training, as well as intern training, with several peer-reviewed publications and national and international conference presentations that followed from the data. However, it is the first time that all of this equipment is housed in one facility and will provide the opportunity for more projects, collaborations and publications to follow.

Reflecting on Recent Months

Academic visit to South African Institute for Aquatic Biodiversity & Annual Student Symposium

Nichole Donough, Chandra le Roux & Tshenolo Masilo
Water Research Group (WRG)

Four members of the UESM Water Research Group (WRG) visited the [South African Institute for Aquatic Sciences](#) (SAIAB) in Makhanda, Eastern Cape from 20 to 25 November 2023. SAIAB is a long-standing collaborator of the NWU. The purpose of this visit was to introduce master's students, Chandra le Roux and Tshenolo Masilo, and PhD candidate, Nichole Donough, to the various research platforms offered by SAIAB and the potential ways as to how these platforms can support/benefit their SAIAB and [REFRESH](#) linked projects. In addition, they were also given the opportunity to present their research findings at the annual [SAIAB Student Symposium](#).

One of the highlights was the National Fish Collection which holds many exquisite preserved specimens and provided a glimpse into the process undertaken to curate a national collection. The collected specimens had intricate morphological structures which reiterated the importance of proper specimen preservation. Additionally, the visit to SAIAB proved to be a serendipitous expedition where we met key personnel and emeritus members of

this dynamic scientific community. Among these influential individuals was Prof. Paul Skelton, the renowned author of *A Complete Guide to the Freshwater Fishes of Southern Africa*. Understanding the operational framework, biobank and specimen photography provided the opportunity for collaborative benefits and participating in the weekly team building activities emphasized the importance of communication and mental well-being in creating a positive and healthy work environment.

Finally, the much-anticipated SAIAB Student Symposium proved to be a great opportunity to meet fellow curious minds in the broader field of aquatic sciences. During the event, fellow postgraduates showcased new discoveries and provided insights on the advances in technology applications. Keynote speaker, Prof. Christopher McQuaid, inspired the next generation of young scientists with words of wisdom. Ultimately, one of our own postgraduates walked away with a prize adding a triumphant note to the end of our visit to the Eastern Cape. (see [Accolades section](#)).



The WRG team visiting SAIAB with acting managing director, Dr Albert Chakona.



Meeting the esteemed emeritus Prof. Paul Skelton.



Visit to the National Fish Collection (A) with the search (B), removal (C) and study (D) of preserved killifish specimens.



Health awareness initiative, participating in the weekly aerobics with SAIAB staff, interns and students.



Group photo of all symposium attendees.

Reflecting on Recent Months

Combined Congress 2024

Joaquim Gerales
Pedometrics Research Group

The Combined Congress 2024 was held at the Wilderness Hotel and Resort from the 22nd to the 25th of January. This annual conference is hosted by the Soil Science Society of South Africa, the South African Society of Crop Production, and the South African Society for Horticulture Sciences. A group of postgraduate students and their supervisors from the NWU's UESM made the long trip to Wilderness situated along the well-known scenic Garden Route. The NWU had the second-largest contingent after the Agricultural Research Council. The conference exceeded our expectations, bringing together some of the foremost researchers and experts in their respective fields. It was an honour to present our research (oral presentations and posters) among such a knowledgeable group.

We gained valuable insights from presenters and from networking with researchers from other institutions

along with those from the NWU Potchefstroom that we got to spend time with. Some of the highlights of the conference include the keynote presentation by Prof. Cornie van Huyssteen, the gathering of the Soil Science Society of South Africa's Student Alliance, the field trip to see three soil profiles, and especially, a refreshing visit to the beach (even though the water was quite cold). On the last evening, we had the opportunity to attend a gala dinner at the Fancourt Hotel in George, where Prof. Gerhard du Preez and Mr Marais Cloete (former NWU student) walked away with some prestigious awards (see [Accolades section](#)). The value of the Combined Congress cannot be overstated as a tool for connecting researchers from across South Africa and improving research quality by exposing delegates to expertise in their own, as well as other fields of research.



North-West University contingent.



Gala dinner.



Fun at the beach.

Reflecting on Recent Months

Disaster Management Planning at the Vredefort Dome World Heritage Site

PW Bredenkamp

African Centre for Disaster Studies (ACDS)

The Vredefort Dome, located on the border between Free State and North West, South Africa, is recognized as Earth's largest impact crater. As a World Heritage site, it faces various hazards, both natural as well as anthropogenic in nature. Understanding the hazards and vulnerabilities of the site and the people residing within, the United Nations Educational, Scientific and Cultural Organization (UNESCO), in partnership with other stakeholders, saw the need to develop a Disaster Management Plan (DMP).

A central component of developing the plan, apart from desktop research, was gathering comprehensive data from those active in the Vredefort Dome. To achieve this, the ACDS organised a workshop with several stakeholders, including local community members, external experts within the context of the Dome, and representatives from both local and national government bodies, using the "World Café" methodology. This method was chosen due to its effectiveness in obtaining a myriad of perspectives within a collaborative setting. During the workshop, participants were grouped to address specific challenges related to the site. After a set time, they rotated, allowing them to engage with different topics and perspectives, ensuring a wide range of data and saturation thereof.

From this workshop, several insights emerged, including local challenges, wider concerns, as well as strategies going forward:

- **Local Challenges:** Participants identified immediate issues faced by residents, such as floods, wildfires, as well as human hazards such as theft and vandalism. These events directly impact the well-being of the community and the preservation of the site.
- **Wider Concerns:** Beyond immediate threats, the discussion extended to encompass broader concerns such as climate change, pollution, and potential risks to the area's biodiversity.
- **Strategies:** Participants brainstormed on mitigation measures, how to allocate resources effectively, more effective communication, and how to devise and implement swift emergency response.

The main takeaways from the workshop included the necessity of involving the local community, as they have intimate knowledge and vested interest in the protection of the Dome; the need for continuous education for both the local community and visitors; as well as understanding the key importance of governance of the natural resources that makes the Dome such a unique area.

Following the workshop, the team at the African Centre for Disaster Studies (ACDS) combined these insights and data to compile and write the DMP, which is in the process of completion and on target to deliver the finished product to UNESCO.



Collaborative discussion of key stakeholders in the Vredefort Dome.



Collaborative discussion on the contingency planning in the Vredefort Dome.



Hazard and vulnerability assessment in the Dome region.

Reflecting on Recent Months

49th Conference of the South African Association of Botanists

Madeleen Struwig
Taxonomic Research Group

Each year, botanists from southern Africa gather during the annual conference of the [South African Association of Botanists](#) (SAAB) hosted by a designated university. This year, the 49th SAAB conference was hosted by the University of Zululand at their Richards Bay campus from 7 to 11 January. The current president of SAAB is one of our own, Prof. Oladapo Aremu, from the Centre of Indigenous Knowledge Systems on the Mahikeng campus.

The NWU had a prominent presence at this conference with 26 of the 166 delegates being from the Potchefstroom and Mahikeng campuses. The Botany subject group was represented by five staff members and eleven students. Students and postdoctoral students presented their research during poster and oral presentations. Well done to our presenters, Drs Tshegofatse Sebitloane and Ademola Adetunji, and students: Charl Clarke, Bianca Boshoff, Anneri du Toit, Joseph Gaorongwe, Tean Joubert, Charlie Sithole, Nqobile Sithole, Tshepiso Tsime and Neo Tsuene!

A highlight of this conference was the first student meeting since COVID-19. A student council consisting of five students from different universities were selected and got the opportunity to meet each other and forge new collaborations and friendships through the many icebreaker activities during the evening.

After three days of intense concentration and presentation stress, the conference was wrapped up with a gala dinner at the Umfolozi Casino in Empangeni. The evening was not only about dressing in your Sunday best, but also for the acknowledgement of outstanding achievements. Once again, the NWU did not disappoint as we walked away with two awards. Read more about these awards in the [Accolades section](#).

Although the staff and students worked hard, they did make time to enjoy a splash in the ocean, to catch a breath of fresh air on a boat ride, a hike in the Mtunzini mangroves and a game drive in one Hluhluwe Game Park.



Staff and students representing the Botany subject group from the Mahikeng campus.



Staff and students representing the Botany subject group from the Potchefstroom campus.



Drs Dikobe and Sebitloane enjoying a breath of fresh air.

Reflecting on Recent Months

Reflecting on the 12th Pollination Symposium held at Kirstenbosch Botanical Gardens, Cape Town

Nikiwe Ndlovu
Geology

The [Twelfth International Symposium on Pollination](#) (ISPXII) was held at one of South Africa's most beautiful botanical gardens: Kirstenbosch National Botanical Gardens in Cape Town was held from 16 to 20 October 2023. The ISPXII symposium hosted a series of presentations on crop pollination by different pollinators, climate change, land use effects on pollinators and pollinator taxonomy, among other related topics. This week-long engagement allowed for the exchange and integration of knowledge on various pollination-related projects from over 19 countries with 69 delegates, 54 presentations, and 11 posters.

The ISPXII served as an ideal opportunity to refine the [proxy study](#) Prof. Frank Neumann and I worked on with the help of our collaborators. We had the opportunity to present observations from my master's pollen research from the savanna biome of the Greater Kruger National Park. The research proved to be quite a unique concept, scarcely investigated in pollination studies.

We highlighted the importance of questioning fundamental science concepts used to base data interpretation on. What if the pollen indicators we are using are not telling us the whole story? The likelihood is that centuries of palaeoecological data have been studied and interpreted under the often-vague understanding of how different pollen transportation pathways affect pollen deposition

and therefore recovered data. Additionally, plants do not all produce the same quantity of pollen, so why are we assuming they do when interpreting fossil pollen archives?

Our research was conducted by observing how various transportation pathways affect the deposition of pollen in both surface sediment and honey samples. This allowed us to improve the translation of Holocene fossil pollen data into more accurate paleo-vegetation and paleoclimate data. Based on the observational findings, pollen from the surrounding vegetation is not always accurately reflected in the surface sediment samples where it accumulates over time. We observed that the quantity of pollen produced by different plants varies and the amounts correlate to the percentage deposited in sediment samples. Furthermore, insect-transported pollen, when compared to wind-transported pollen is less represented in surface sediment samples than in honey samples.

The ISPXII symposium brought together global perspectives on pollination, and our study encouraged a reevaluation of how we interpret pollen data in paleoecology. This reevaluation offers a clearer understanding of ancient vegetation and climate, challenging long-standing assumptions.

Click here for more information on [NWU Geology and soil sciences](#).



Group photo of all delegates from 19 countries during the 12th Pollination Symposium held in Cape Town Kirstenbosch Botanical Gardens.



Nikiwe Ndlovu presenting her master's research findings



Reflecting on Recent Months

Uniting for Climate Action: A Scholar's Experience at COP28

Nisa Ayob

Climatology Research Group (CRG)

I am a lecturer at the Department of Geography and a PhD candidate. Upon concluding my PhD journey, I was invited by my supervisor, Prof. Roelof Burger, to attend the 28th meeting of the Conference of the Parties (COP). COP28 was held from the 8th to the 11th of December 2023 in Dubai, a city known for its skylines and iconic landmarks such as the Burj Khalifa.

The COP is considered the most important climate change conference because it is the main decision-making body of the United Nations Framework Convention on Climate Change (UNFCCC). It includes international representation, with delegates from almost every country, enabling global discussions and collective action on climate change. COP is a platform for establishing international climate policies and has been instrumental in forming major agreements like the Kyoto Protocol and the Paris Agreement.

The moment I entered the vast conference space, bustling with an international assembly of delegates, policymakers, scientists, activists, and various stakeholders, I was overwhelmed by the magnitude and importance of the event. It was an incredible experience

to see the world unite in tackling climate change, an issue that knows no borders and demands collective action. My research focuses on the impacts of climate change, and during the event I engaged in numerous discussions and presentations covering various subjects, from climate change mitigation to adaptation strategies. The ongoing discussions on climate change and its impact on water and health deeply resonate with the kind of research I focus on. It reinforces my belief that my research makes a difference and that my work contributes to the bigger picture. Each encounter provided deep insights and diverse viewpoints, greatly enhancing my comprehension of the intricate issues related to climate change.

Attending COP28 was truly the icing on the cake of my PhD journey, serving as a poignant reminder of our world's interconnectivity and our collective duty to protect the Earth for future generations. Reflecting on this event, I am thankful for the chance to participate in this global endeavour and feel motivated to persist as a researcher committed to furthering climate science. This experience would not be possible without the financial support from the Faculty of Natural and Agricultural Sciences (FNAS) deanery and encouragement from the director, Prof. Piketh and Prof. Bezuidenhout. I am immensely grateful to Prof. Roelof Burger and Prof. Dirk Cilliers for their support throughout my PhD journey and for inviting me to attend COP28.



Prof. Roelof Burger (third from the left) was invited as a panellist to discuss how water scarcity can be solved with rainfall enhancement: A climate responsive discussion at COP28.



Nisa Ayob at COP28.

Reflecting on Recent Months

Young researchers were Leuven it up in their visit to Belgium

Last year, my fellow PhD colleague Lomarie and I, from the UESM's Water Research Group (WRG), had our first visit to Leuven, Belgium, from 22nd September to 12th October. This visit marked the beginning of our joint PhD program at the University of Leuven (KUL).

Our supervisors from the NWU, Prof. Victor Wepener and Prof. Nico Smit, and other members of the NWU and WRG joined us on this exciting trip! We met up with our KU Leuven supervisors, Prof. Luc Brendonck and Dr Eli Thoré. Soon after, we were introduced to the rest of the Belgium team that we'd be working with throughout our visit.

The main aim of this visit was for us to gain valuable insight into- and experience on the fish that we'd be working with, *Nothobranchius furzeri* (the African turquoise killifish). During this time, we were trained on the husbandry of killifish while working at TRANSfarm, assisting Dr Charlotte Philippe and her master's student in maintaining their culture prior to her experiment. We also spent time

Nichole Donough & Lomarie Janse van Rensburg
Water Research Group (WRG)

in the KU Leuven killifish facility where we learned how to apply their procedures in the NWU's ZebTEC systems at the National Aquatic Bioassay Facility.

On the days that we were not hard at work with the killifish, we were sightseeing beautiful landmarks in Leuven, Brussels and Ghent as well as tasting all the foods and treats those cities had to offer.

This was an amazing opportunity as it shows that research can take you places. This experience is motivating and further reinforces our passion as young researchers. It also opens our eyes to other research facilities and the various studies being conducted at international universities. We take pride in recognising that the NWU-UESM's WRG stand among the best in our field.

We are thankful to the VLIR-UOS (Flemish Interuniversities Council-University Development Co-operation) program for the funding that was provided for this research visit.



Part of the WRG team on a train ride to Leuven.



Starting off sightseeing on a high note.



WRG team sightseeing.



Fin-tastic picture of the killifish.



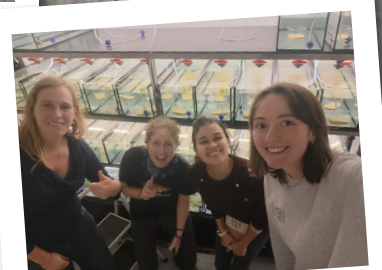
The WRG students having a staple food of Belgium.



WRG on their way to the Irish Pub to support the Bots in Leuven.



Nichole and Lomarie hard at work with killifish egg counting.



Nichole and Lomarie at TRANSfarm with Dr Charlotte Philippe and her master's student.

Homes can be biodiversity hotspots

Russell Yong¹, Matt Holden² & Andrew Rogers²

¹Water Research Group (WRG); ²University of Queensland

Amid the pressures and constraints of living in modern, developed environments, it is easy to forget that even our most urban environments can harbour surprising amounts of natural biodiversity. Just how much biodiversity has not often been quantified but, with the advent of tools like iNaturalist and social media like specific Facebook groups which aid identification, gaining such insights whilst engaging citizen science efforts has become easier and provided valuable data.

A recent study, newly published in [Ecology](#), starkly illustrated the scale to which even modest suburban residences could sustain high amounts of natural richness. The study, initiated during COVID-19 national lockdowns when the authors were confined to working

from home, involved censusing every species seen in, on and from a typical suburban house sitting on approximately 400 m² in inner-city Brisbane, Australia. Over a one-year period (April 2020 to April 2021), 1,168 species were logged from this property, a truly astonishing number. This number included a staggering 437 species of butterflies and moths, 87 species of bees, wasps and ants, 63 spider species and over 100 plant species.

The authors [identified](#) several key processes that might have helped magnify biodiversity on their property: 1) minimal attempts to control the plant species in the garden, whether through chemical or physical methods, leading to the self-growth of many plants; 2)



Observing and documenting wildlife in one's own house and garden can be a greatly fulfilling way to connect with nature. Photo credit: Russell Yong



Private properties in South Africa can be massive, but even small suburban properties can harbour huge amounts of biodiversity. Photo credit: Russell Yong

poisons (pesticides, herbicides, repellents and indoor sprays) were almost never used; and 3) the presence of both native and exotic flowering and fruiting plants, greatly encouraging pollinating and fruit-eating species. Although this may make it sound like weeds and pests were rampant, in actuality they were the minority of observed species, and even though many plants were indeed weeds, their flowers and vegetation were still important in providing numerous species with resources.

This study powerfully demonstrated how even small land blocks in urbanised areas should not be undervalued in terms of their importance to urban ecology, and how relatively simple steps, when taken, can greatly support wildlife in highly-developed environments. In an era of global extinction crisis and increasing pressure on wild ecosystems, it is critical that we exercise any ability to census and preserve biodiversity wherever possible, even within our suburbs and cities.



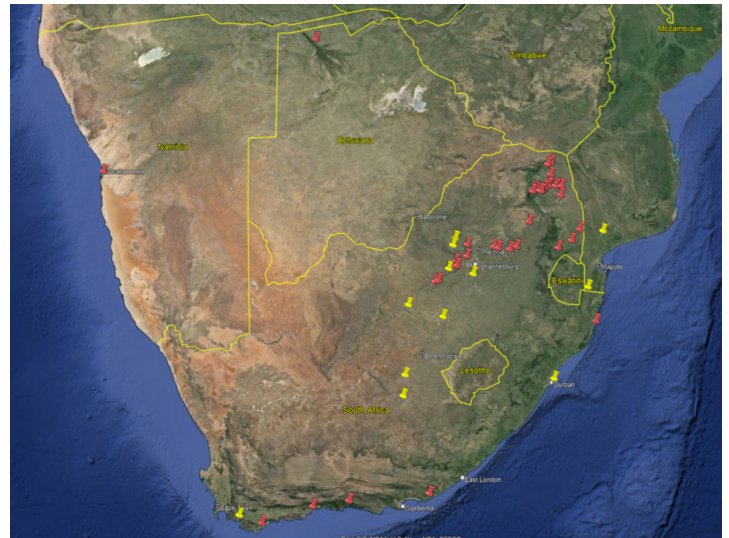
A montage of moths observed at Building G23, NWU Potchefstroom campus. Even urbanised environments such as the university campus can be habitat for a wide range of species. Photo credit: Russell Yong

Scarce Skills make the mercury rise in southern Africa

Hannes Erasmus

Water Research Group (WRG)

Mercury (Hg) contamination is a major concern worldwide, as global emissions and environmental concentrations are increasing. It is estimated that 2,220 metric tons of Hg are emitted into the environment annually from anthropogenic (human activity) sources alone. The major anthropogenic Hg sources include artisanal and small-scale gold mining (ASGM) with 37.7%, stationary coal combustion (21%), non-ferrous metal production (15%) and cement production (11%). When Hg enters the environment, it does not only act as a local contaminant but also as a global contaminant, as it can be transported long distances by means of atmospheric deposition. South Africa is considered to be one of the top ten contributors to global Hg emissions, primarily due to coal-fired power stations, with 18 coal-fired power stations accounting for 84% of the country's electricity production. Another major Hg source in South Africa is ASGM as informal gold mining increased over the past decade. However, it is difficult to estimate the Hg emissions produced by

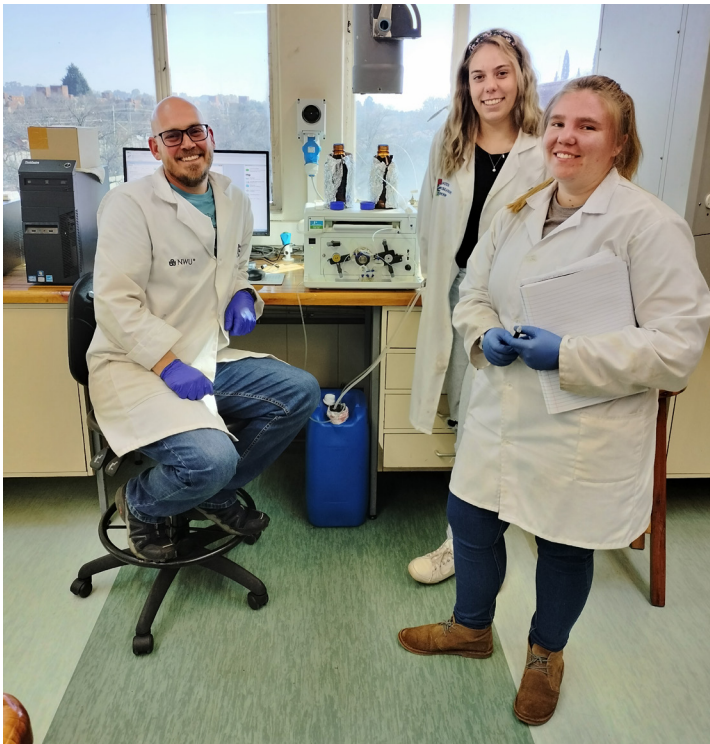


Map of the studies sites of mercury assessment data that have been published (yellow markers) and future study sites with data still to be published (red markers).

these informal gold mining activities.

The last review of Hg pollution in South Africa was published in 2011, where the authors assessed water and sediment concentrations in all 19 Water Management Areas (WMAs) between 2007 and 2009. This study also classified the major Hg anthropogenic sources in each WMA, however, some of the WMAs were only represented by one site and no biological matrix was assessed. The limited information on Hg pollution in South Africa got Dr Hannes Erasmus invested, as he has always been intrigued and passionate about how contaminants affect aquatic ecosystems and the biota living in these systems. He submitted a proposal to assess Hg contamination in aquatic ecosystems and the biota within to the National Research Foundation (NRF) and received a Scarce Skills Postdoctoral Fellowship from the NRF for 2022 and 2023.

During this fellowship, he trained seven honours and one master's student on the techniques for assessing Hg in environmental matrices. These students all graduated by 2023 and four more master's students are expected to submit by the end of 2024. This Hg research led to two international conference presentations in 2022, as well as one international and five national conference presentations in 2023. Four peer reviewed articles



Dr Hannes Erasmus together with one of his honours students, Simoné Heyneke, and one of his master's students, Chelsea Withfield, at the Flow Injection Mercury System (FIMS).

have been published by 2023, ranging between Hg assessment in sharks, skates and rays along the South African coastline, as well as in two eel species in Mozambique, trophic transfer of Hg through aquatic food webs in South Africa's largest floodplain system to the assessment of human health risks when consuming Hg contaminated fish species. Some future research to look out for include the use of artificial mussels as a monitoring tool of Hg exposure, monitoring Hg concentrations in aquatic ecosystems from different sources using the freshwater clam *Corbicula* sp., as well as Hg accumulation in tigerfish from the Okavango Delta to name a few.

The research conducted during the two-year fellowship provided a baseline to work from and it is expected that the results will contribute to a better understanding of Hg contamination in South African aquatic ecosystems and the biota living in these systems.



Laboratory setup exposing artificial mussels and the freshwater clam *Corbicula* sp. to a range of mercury concentrations.



Dr Hannes Erasmus presenting research on mercury trophic transfer at the Southern African Society for Aquatic Scientists (SASAqS) conference in 2023.

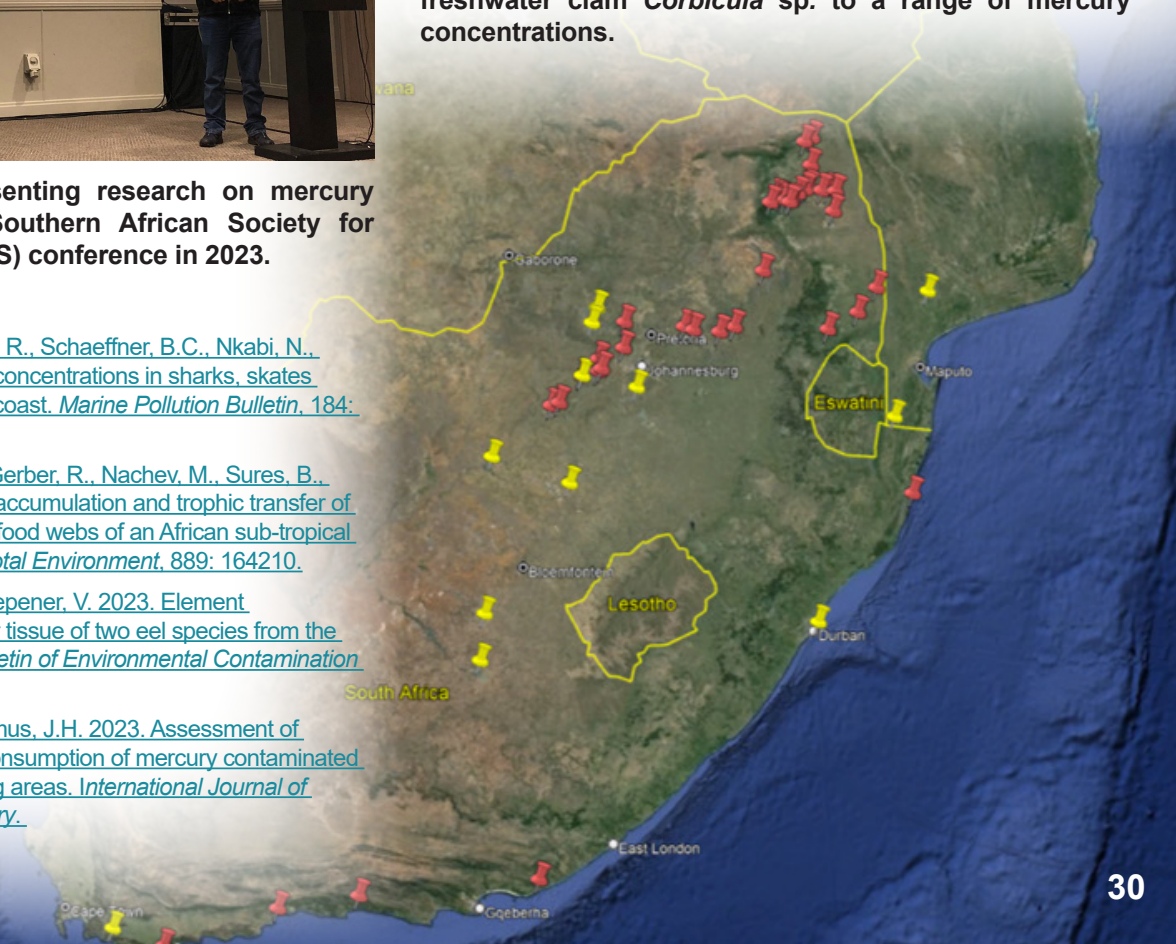
Further reading:

[Erasmus, J.H., Smit, N.J., Gerber, R., Schaeffner, B.C., Nkabi, N., Wepener, V. 2022. Total mercury concentrations in sharks, skates and rays along the South African coast. *Marine Pollution Bulletin*, 184: 114142.](#)

[Van Rooyen, D., Erasmus, J.H., Gerber, R., Nachev, M., Sures, B., Wepener, V., Smit, N.J. 2023. Bioaccumulation and trophic transfer of total mercury through the aquatic food webs of an African sub-tropical wetland system. *Science of the Total Environment*, 889: 164210.](#)

[Erasmus, J.H., Herselman, S., Wepener, V. 2023. Element concentrations in muscle and liver tissue of two eel species from the Incomati River, Mozambique. *Bulletin of Environmental Contamination and Toxicology*, 111: 34.](#)

[Stevens, E.L., Wepener, V., Erasmus, J.H. 2023. Assessment of human health risks through the consumption of mercury contaminated fish from gold and platinum mining areas. *International Journal of Environmental Analytical Chemistry*.](#)



Concerning levels of pharmaceuticals, personal care products, plasticizers, and organophosphorus flame retardants in Lake Victoria

Henk Bouwman, Henrik Kylin & Florence Nantaba

In three publications, two in *Chemosphere* and one in *Science of the Total Environment*, we report on the presence and concentrations of 25 pharmaceuticals, 11 personal care products, six phthalate ester plasticizers, and eight organophosphorus flame retardants in sediments and water on the Uganda side of Lake Victoria.

Lake Victoria is the largest lake in Africa and the second largest freshwater lake in the world. It supports important fisheries to millions of people and fresh water via the Nile River through South Sudan, Sudan, Ethiopia, Egypt, passing by Khartoum and Cairo, discharge into the Mediterranean. The water of Lake Victoria plays a large role in the economies and ecologies along its course, feeding the vast Sudd wetlands while transporting sediment which is vital to agriculture downstream all the way to Egypt. However, whatever pollutes Lake Victoria will not only affect the ecology and people around the Lake but may do so downstream of the longest river in the world, into the Mediterranean.

Sediment and water samples were taken in five bays on the northern shores of the Lake by Florence Nantaba and John Wasswa (Makerere University, Uganda), and



Fishermen on Lake Victoria. (Photo credit: Henrik Kylin)



Water contact patterns of humans and birds. (Photo credit: Henrik Kylin)

analysed in Germany in the labs of Wolf-Ulrich Palm and Klaus Kümmerer at the Leuphana University of Lüneburg. Profs. Henk Bouwman and Henrik Kylin (Linköping University, Sweden) were also involved. For many of the chemicals, these were the first data collected in Africa. Sulfamethoxazole, trimethoprim, ibuprofen, and diclofenac were most predominant in [water](#), while ciprofloxacin, ibuprofen, levofloxacin, and propranolol dominated in [sediments](#). Triclosan, dibutyl phthalate, and tris-(2-chloroethyl) phosphate were the other contaminants found in [water](#). In all cases, the highest concentrations were in Murchison Bay which drains Kampala, the largest city on the northern shore. All three papers found risk quotients exceeding the individual risk levels for many of the chemicals towards aquatic biota (See Box 1). We stress the biological risks of the mixtures that will most certainly exceed the risks of the individual compounds.

The five bays differed dramatically in concentrations and relative compositions, underscoring the need for differentiated interventions in the respective drainages.

As the Lake funnels through the Napoleon Gulf into the White Nile, an estimated 7 000 000 tons of sediment is carried by 18 km³ water by the White Nile every year. The downstream and cross-border influence of upstream pollution is therefore concerning, requiring more research and mitigation at the source.

Box 1

Chemicals exceeding risk quotients to aquatic organisms:

Sulfamethoxazole, oxytetracycline, erythromycin, diclofenac, Sulfamethoxazole, sulfamethazine, oxytetracycline, tetracycline, ciprofloxacin, levofloxacin, norfloxacin, carbamazepine, atenolol, metoprolol, triclosan, musk ketone, 4-MBC, dibutyl phthalate, bis-(2-ethylhexyl) adipate, bis-(2-ethylhexyl) phthalate, tricresyl phosphate, triphenyl phosphate, tris-(2-chloroethyl) phosphate.

Acknowledgements

This study was supported by the International Programme in Chemical Sciences under the International Science Programme, Uppsala University, Sweden, the German Academic Exchange Service, North-West University, and the Makerere University.



Dr Nantaba busy with extractions. (Photo credit: Florence Nantaba)

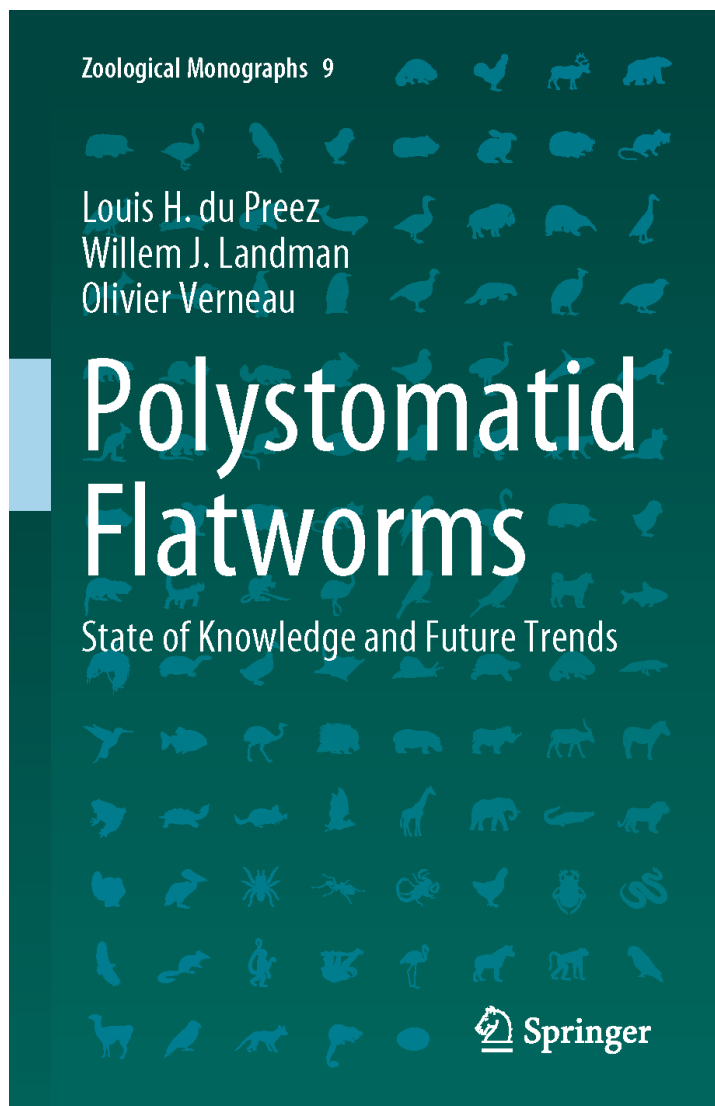


New book in Springer Zoological Monographs series: Polystomatid Flatworms: State of Knowledge and Future Trends

Louis du Preez, Willem Landman & Olivier Verneau

This 645 page book offers a comprehensive guide to the fascinating world of polystomatid flatworms. It is the culmination of four decades of research on this group of parasites. Polystomes are monogenetic flatworms that are found, not only in all three orders of amphibians namely frogs, salamanders and worm amphibians, but also in freshwater turtles, the Australian lungfish and on the eye of the hippopotamus.

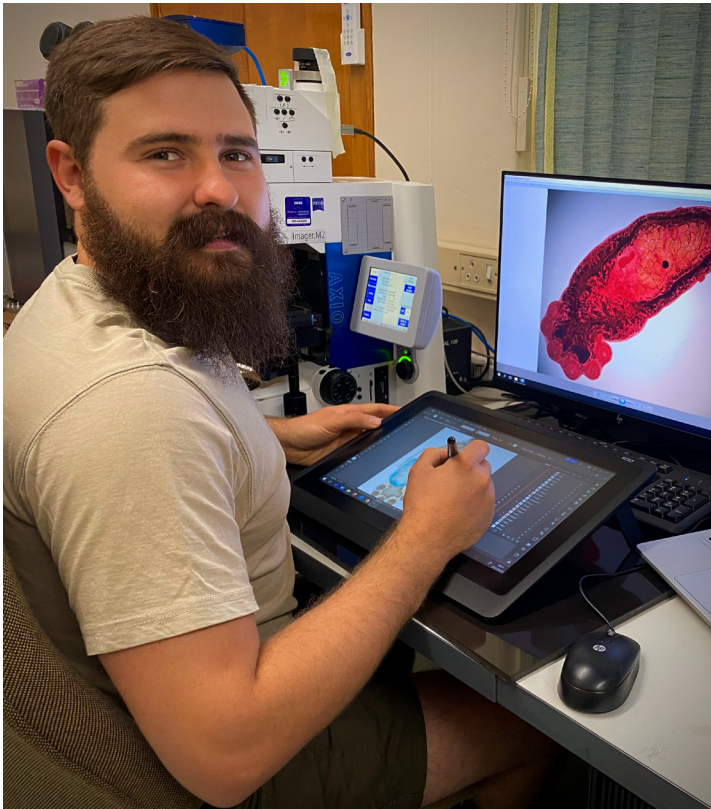
This book introduces the reader to the individual life histories of polystomes and the chronological advances in our knowledge, with descriptions of species discovered over the past centuries. Chapter one covers the diversity and provides a key to the genera. Chapter two presents the history of research on this group of parasites and provides information on the discovery of each polystome and acknowledges the authors



Front page of the book, [Polystomatid Flatworms: State of Knowledge and Future Trends](#).



Prof Olivier Verneau (left), from the University of Perpignan, specializes in the herpetofauna of France, focusing on the threatened Mediterranean turtle *Mauremys leprosa*. Prof Louis du Preez's (right) research centers on parasites, diseases, and conservation of amphibians and freshwater turtles, with a particular interest in polystomatid flatworms.

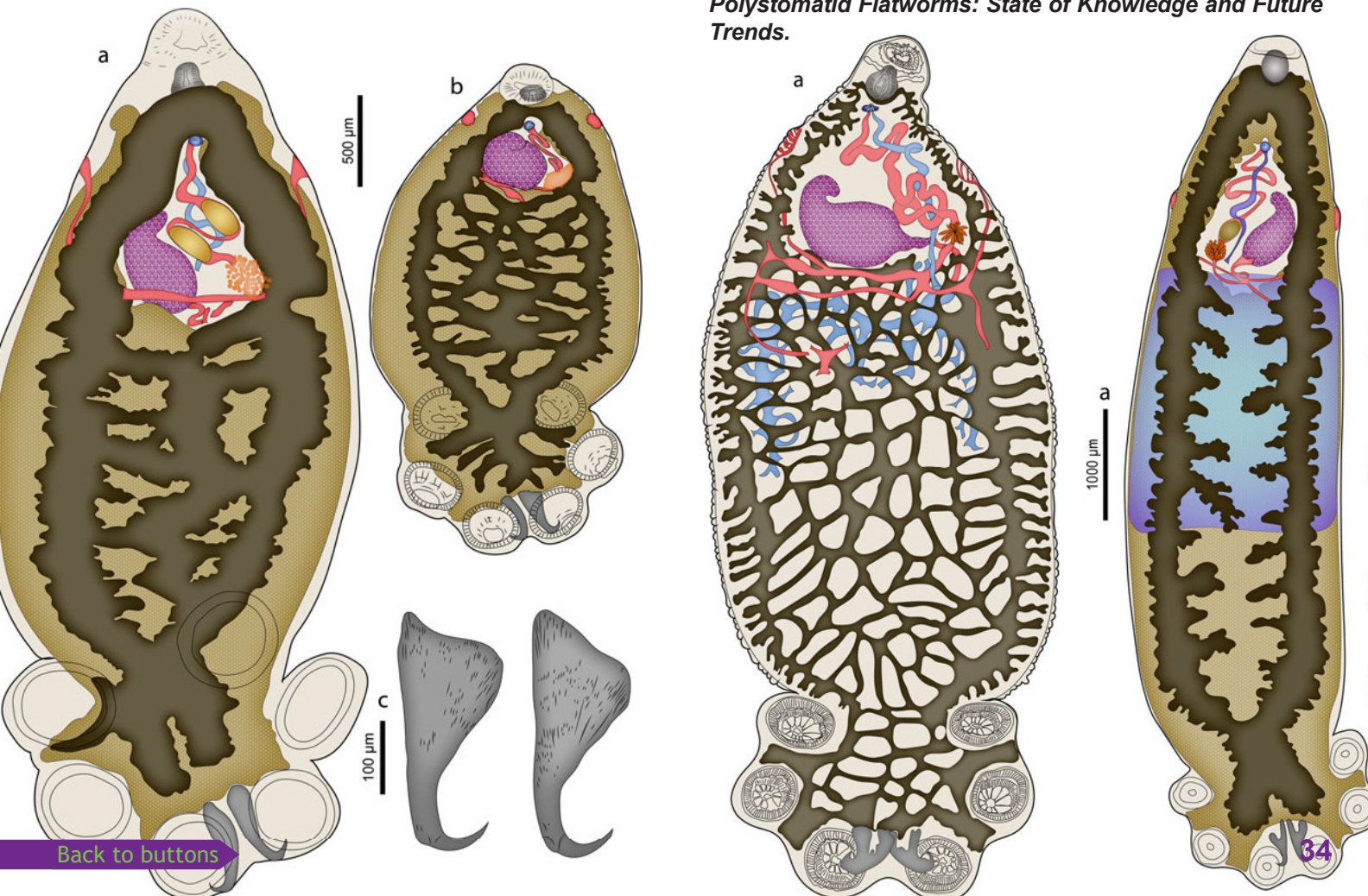


Mr Willie Landman deeply engaged in his area of expertise, focusing on taxonomic illustrations of polystomatid flatworms.

that have made major contributions. Chapter three equips newcomers to the field with basic protocols and techniques for collecting, processing and interpreting material. For the established researcher in the field, Chapter four offers a reference book containing taxonomic data, measurements and drawings of all known amphibian polystomes and Chapter five all non-amphibian polystomes. Chapter six deals with the lifecycle strategies, Chapter seven the Origin and Evolution of the family and Chapter eight deals with future prospects. The authors have brought together all the available material, creating a resource that will stimulate research and revive the global focus on this unique group of parasites. Thus, this work provides an essential reference for both established researchers and newcomers to the field.

A key feature of this book is the high quality colour drawings of all parasites and of the life-cycles prepared by Mr Willie Landman. Prof Louis du Preez leads the African Amphibian Conservation Research Group (AACRG) and Prof Olivier Verneau is a professor of Zoology at the University of Perpignan in France. Prof Louis and Prof Olivier have been collaborating for more than 20 years and co-authored several publications.

Some illustrations of Polystomatids as presented in *Polystomatid Flatworms: State of Knowledge and Future Trends*.



Another day, another fire: Is climate to blame?

Danie Boshoff

African Centre for Disaster Studies (ACDS)

Nowadays, fires capture headlines on a weekly (sometimes daily) basis: blazes in the Hawaii islands, Canada, and in the Kalahari. These headlines often ignite debates about arsonists and the ever-present 'threat' called climate change. Popular media news reports mostly focus on the negative impacts these events have on humans – loss of lives, property damages and economic losses. While these impacts are significant, the negative perception of fires have spread like wildfire. Unfortunately, this perception not only overshadows the positive impacts of fires in many ecosystems – such as the germination, regeneration and flowering of plant species – but also undercuts the fact that fire has been occurring naturally in all ecosystems on earth even before human intervention. So, are we experiencing an increase in fire events and are these fires a direct result from climate change? [NASA](#) supports the notion that warmer temperatures from climate change are mostly responsible for the unusual fire season in the Northern Hemisphere in 2023. However, conditions favouring the spread of fires are complex and dynamic. While fires require favourable climatic conditions, the presence of dry fuels and ignition sources (human or natural), there is a need to study fires over large time and spatial (area) scales. This requirement can help us understand whether fires are indeed increasing in number; if the severity of fires are increasing – not only in terms of human impact, but also in terms of the total burnt area; and how effective fire management policies have been in mitigating risks posed by fires. Delving

into the science quickly illuminates the wide range of drivers which can affect fires – weather, seasons, climate, soil moisture, soil type, topography, surface water, ground water, herbivory, and human activities. There is some disagreement about which driver is the most significant today. Some scientists argue that climate is the most prominent factor influencing fires today, while others point to the wide array of human activities which have altered the natural environment. These disagreements fail to see the importance of considering the bigger picture – or viewing all these aspects together holistically. It is only when one can consider how the drivers of fire not only affect each other, but also how they vary across ecosystems and even within ecosystems that one can gain meaningful understanding of fires and recommend efficient ways to limit the negative impact of these events on humans. In the UESM's Disaster Risk Science sub-programme, research about fires, the interaction of fire drivers and fire management policies are conducted.

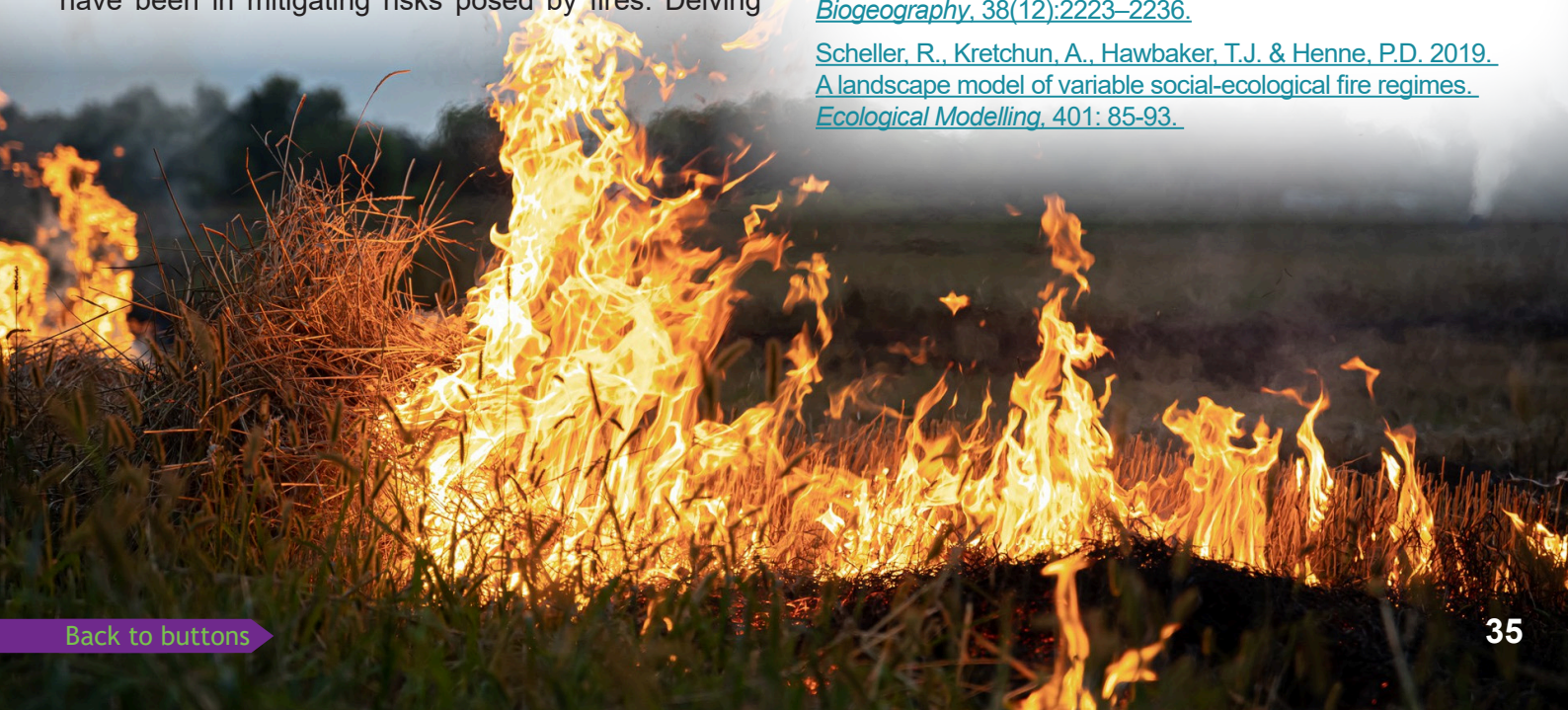
For more information, contact Danie.Boshoff@nwu.ac.za.

Further reading:

[Archibald, S. 2016. Managing the human component of fire regimes: Lessons from Africa. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 371\(1696\).](#)

[Bowman, D.M.J.S., Balch, J., Artaxo, P., Bond, W.J., Cochrane, M.A., D'Antonio, C.M., Defries, R., Johnston, F.H., et al. 2011. The human dimension of fire regimes on Earth. *Journal of Biogeography*, 38\(12\):2223–2236.](#)

[Scheller, R., Kretchun, A., Hawbaker, T.J. & Henne, P.D. 2019. A landscape model of variable social-ecological fire regimes. *Ecological Modelling*, 401: 85-93.](#)



Old Mutual Foundation build capacity through Disaster Risk Reduction Toolkit

Kristel Fourie

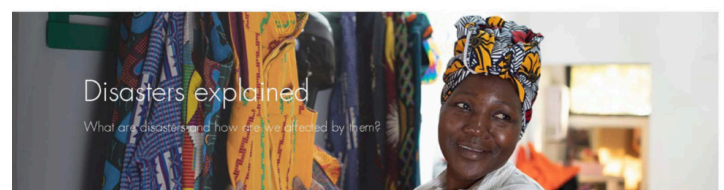
African Centre for Disaster Studies (ACDS)

Nothing undermines sustainable development like disasters as they have the ability to instantly destroy decades of development progress ([UNDRR, 2022](#)). Disaster events reported per year have increased significantly in the last two decades. [The International Disaster Database](#) (EM-DAT) has recorded over 7,348 disaster events that claimed approximately 1.23 million lives, affected over 4 billion people and led to approximately US\$ 2.97 trillion in economic losses worldwide over the last two decades ([CRED, 2020](#)). It is, therefore, fundamental to understand and reduce risk and build community resilience in a world full of uncertainty to achieve sustainable development. To achieve this goal, amongst other things, the [Sendai Framework for Disaster Risk Reduction](#) (SFDRR) encourages all stakeholders, including “business, professional associations, and private sector financial institutions, including financial regulators and accounting bodies, as well as philanthropic foundations, to integrate disaster risk management, ...; engage in awareness-raising and training for their employees and customers...” ([UNISDR, 2015](#)).

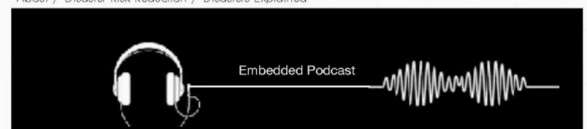
On this basis, the [Old Mutual Foundation](#) (OMF) consulted the NWU-UESM’s [African Centre for Disaster Studies](#) (ACDS) to develop a toolkit to raise disaster risk awareness for their employees and customers, familiarise them with disaster risks they are facing and inform them of the various actions that could be taken to minimise these risks. Moreover, OMF endeavours to empower communities and drive positive change in the country, leaving a sustainable impact. This is reflected in the OMF strategy for 2021-2025, which states that the Foundation aims to have an even greater impact on society by deepening its focus on disaster support ([OMF, 2020:76](#)). The toolkit will comprise a diverse mix of communication channels to extend the reach and increase the probability that messages will successfully result in a change ([Mileti et al., 2004](#)).

The ACDS has, therefore, been working to develop the components for this toolkit since February 2023. The products that will form part of the toolkit include podcast episodes, short animation films, and web-based information content. There are four main themes included in the initial toolkit. These are 1) Disasters Explained, 2) Understanding Disaster Risk Reduction, 3) Disasters and Climate Change, and 4) Building Community Resilience. Various academics and practitioners from South Africa and other areas in the region have contributed to the content of the podcast episodes on each of the themes.

The OMF regard its role in disaster risk reduction as important, and according to the acting head of the Foundation, Mr Tsotsotso, organisations like the OMF can endeavour to reduce the effects of events on vulnerable communities. Furthermore, Mr Tsotsotso sees collaboration between academic institutions and organisations like Old Mutual in the private sector as crucial in the risk reduction process. Disasters, we know, impact all sectors of society, and the business sector is no different. The development of the podcasts and the animations are ongoing and will be available to access through the Old Mutual website once completed.



About / Disaster Risk Reduction / Disasters Explained



Risk, in various forms, is part of everyday life. One such form of risk is the risk of disasters. Although disasters are something that everyone has heard of, and to an extent understand, it is not always clear to what degree someone is affected by a disaster, and that the risk could be increasing by the minute.

A disaster is a catastrophic event (such as a natural or anthropogenic hazard) that causes widespread damage, destruction, and loss of life and is of such an extent that those affected can't cope with it using only their own resources. Though events such as cyclones, earthquakes, and floods are perceived to be natural disasters, the term "natural disaster" is false. This is because these events occur due to the natural cycles and processes of the Earth. The impact of these events on humans is only because of our the decisions on where we settle, how we build, and our risk perception, and not being prepared for, or having the capacity to endure the event. Disasters are thus not solely the result of natural events, but rather the interaction between natural hazards and human vulnerabilities.

In this podcast episode we look at how disasters and resilience interacts, and why it is important for the stakeholders of the Old Mutual Foundation to understand this.



Animation Preview

Web links - further reading

Website preview.

IN PARTNERSHIP WITH



OLDMUTUAL

Two new species of bushveld arums discovered in South Africa

Madeleen Struwig¹ & Stefan Siebert²

¹Taxonomic Research Group; ²GeoEco Lab

Among the ultramafic outcrops on hillsides of Sekhukhuneland, two new species of bushveld arums (*Stylochaeton*) have been growing unnoticed until botanists of the GeoEco Lab of Prof. Stefan Siebert dug deeper into the metalliferous soil to study metal accumulating plants (Adhikari *et al.* 2022). The plants were initially identified as *Stylochaeton natalense* (Figure 1A, B), the only species in the genus known from South Africa. On closer inspection, the reproductive structures were carried two-thirds subterranean, a feature not seen in *Stylochaeton natalense*. The fruit are buried almost entirely in the soil. These two newly described taxa bring the total number of *Stylochaeton* species recognised for South Africa to three.

Both these species are endemic to the Sekhukhuneland Centre of Endemism and are sadly in danger of extinction as there are less than ten populations known from each. These populations are increasingly under threat from urban expansion and mining. They are, therefore, assessed as Endangered according to IUCN Red List categories and criteria.

Stylochaeton is classified in the Araceae, the same family to which the well-known garden ornamental, *Zantedeschia aethiopica*, commonly known as white arum or calla lily (*wit varkoor*), is classified. Characteristic of the family is the inflorescence carried in a spike, comprising a thickened axis with female flowers at the bottom and male flowers towards the

apex. The flowers are enclosed in a coloured vase-shaped modified leaf called a spathe in the shape of a pig's ear.

The two new species are both similar in leaf shape to that of the common bushveld arum. *Stylochaeton glaucophyllum* (blue bushveld arum; Figure 1C), however, has characteristically blue-green leaves, hence the specific epithet. Its cream-coloured or brownish spathe causes the inflorescence to blend with the surrounding dry grass, rocks and soil. The ripe berries omit a pleasant scent that is reminiscent of that of a ripe mango fruit, suggesting that seeds are dispersed by an animal.

The leaves of *Stylochaeton sekhukhuniense* (Sekhukhune bushveld arum; Figure 1D) are bright jade green. The feature that characterises this species, and differentiates it morphologically from the blue bushveld arum, are two elongations at the tip of the petiolar sheath. The spathe is cream-coloured on the inside, but brownish olive-green on the outside.

These two endemics also increases the number of endemic arums from ultramafic rock in Sekhukhuneland to four, also including *Zantedeschia jucunda* (Leolo lily) and *Z. pentlandii* (Mapoch lily), the two renowned bright yellow arums. Our poor knowledge of bushveld arums in South Africa is highlighted by our recent discovery of a further two species on serpentinites in the Barberton region. It seems like the diversification of this genus is

associated with metalliferous soils and is a great topic for further research.

[Paper access](#)

[News@NWU](#)

[The Citizen](#)

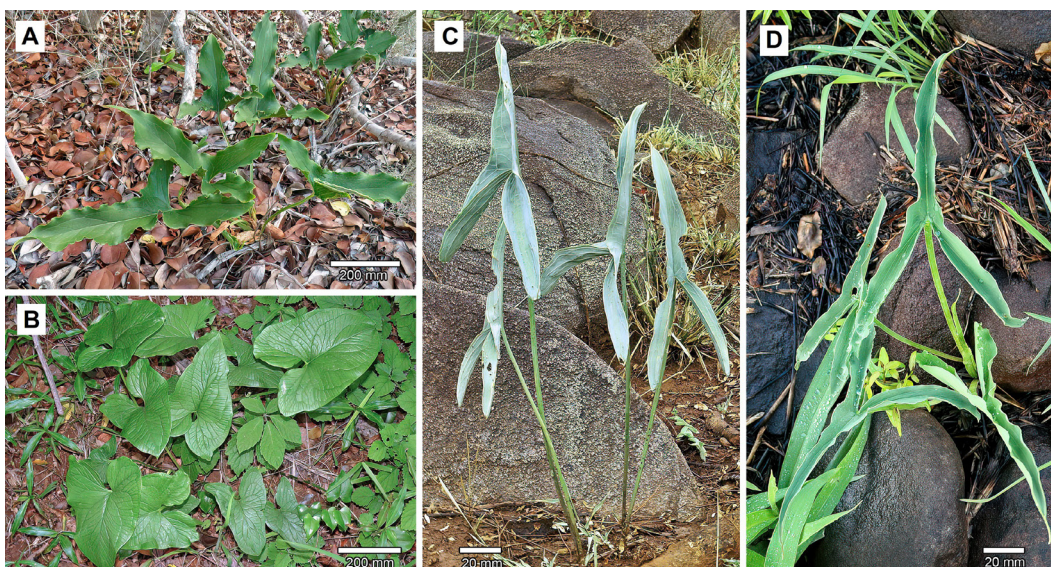


Figure 1:

A) *Stylochaeton natalense* with ca. sagittate leaves; B) *Stylochaeton natalense* with ca. hastate leaves; C) *Stylochaeton glaucophyllum*; D) *Stylochaeton sekhukhuniense*.

Photo credit: A) W. McClelland; B) R.G.C. Boon; C) A. Klopper; D) S.J. Siebert

SCIENCE FACT BOX



Breathing in nano-particles from stoves



Invasive ant changes lion's dinner menu



Critical importance of wetlands



3D tree fossil - glimpse at forest understory



Air pollution linked to Alzheimer's



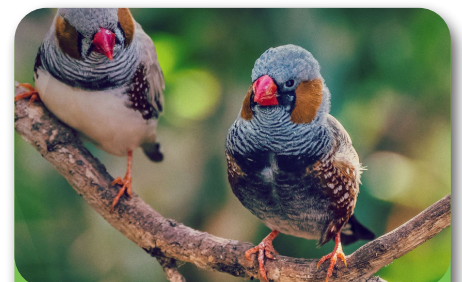
Green space in urban areas - better health



Cut carbon footprint with dietary changes



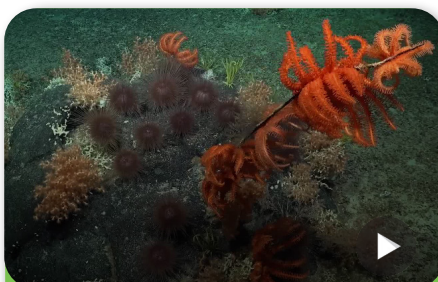
Evolving a deadly trap



Daily vocal training in songbirds



Fungal disease - wheat production



Underwater mountain range - 100 new species



Quinoa mystery finally solved

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- Macro-organisms / wildlife
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We invite all UESM staff members, postdoctoral fellows, and postgraduate students to participate in this year's photography competition.

Show off your spectacular **photographs AND videos!!**

Photos used in this poster have been submitted for the 2021 and 2022 photography competitions.

Acknowledgements

We would like to express our gratitude towards all contributors to this year's first edition, ENVIRA *Autumn* Edition 2024.

To the **authors**, we greatly value your willingness to commit to writing these articles and submitting them on time. We acknowledge the effort and time spent in producing the contents of each article.

Special thank you to **Ms Kobie Fourie** for agreeing to be interviewed for this edition.

To our **readers**, just as much as we value our authors, we recognise that releasing the ENVIRA and showcasing UESM research and activities would be in vain if not read. With that in mind, we would like to sincerely thank our loyal readers. We appreciate you taking the time to engage with our content.

We appreciate every contribution and effort invested in producing this edition.

We invite you to share your feedback on this edition as well as any ideas you may have for future editions.

If you're interested in contributing to the ENVIRA *Winter* Edition 2024, the submission deadline is **6 May 2024**.

We're looking forward to the next edition.

Sincerely,
Clarissa and Frances

Photo credit:

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