

# WATERWORLD

The South African Institute for Aquatic Biodiversity (SAIAB) is a National Research Facility of the National Research Foundation (NRF). SAIAB is a recognised centre for the study of aquatic biodiversity and serves as a major scientific resource for the knowledge and understanding of aquatic biodiversity and functioning of significant aquatic ecosystems. At your own pace, visit the exhibits at Water World to learn more about water and the incredible variety of life in water, from some of the tiniest organisms to some of the larger sharks. Find out about studying fish ear bones, extracting DNA, fish tracking, aquatic insects, life on the sea floor and the biocontrol of alien species! Visit the fish farm and the National Fish Collection or go on a field trip to the coast. Entrance to the Water World venue is from the Barratt Car Park on African Street.

www.saiab.ac.za

## OPENING HOURS AND VISITOR INFORMATION:

**7, 8, 9, 12, 13 March: 09h00-17h00** All welcome and entrance to the facility is free.

SAIAB  
Somerset Street  
Grahamstown

| EXHIBITIONS DAILY - ENTRY IS FREE - REGISTER AT THE ENTRANCE  |
|---|
| <b>Albany Museum, Department of Freshwater Invertebrates</b><br><i>Exploring African freshwater insects</i>   |
| <b>Keep Fin Alive</b>   |
| <b>KwaZulu-Natal Sharks Board</b>   |
| <b>Rhodes University, Department of Ichthyology and Fisheries Science</b><br><i>Ear bones in fish and their secrets</i>   |
| <b>Rhodes University, Department of Ichthyology and Fisheries Science</b><br><i>Keeping fish in Grahamstown</i>   |
| <b>Rhodes University, Centre for Biological Control (Department of Zoology and Entomology)</b><br><i>Innovative control of invasive species!</i>  |
| <b>Rhodes University, Institute for Water Research</b><br><i>Water, the connector of all life</i>   |
| <b>Rhodes University, Marine Natural Products Research Consortium (Department of Biochemistry and Microbiology)</b><br><i>The unseen majority: a window on the marine microbial world</i> |
| <b>SAEON</b><br><i>Monitoring change in SA environments</i>   |
| <b>South African Institute for Aquatic Biodiversity (SAIAB)</b><br><i>Growing our own timber!</i>   |
| <b>South African Institute for Aquatic Biodiversity (SAIAB)</b><br><i>Unravelling DNA</i>   |
| <b>South African Institute for Aquatic Biodiversity (SAIAB)</b><br><i>Life on the sea floor of South Africa</i>   |
| <b>South African Institute for Aquatic Biodiversity (SAIAB)</b><br><i>Of frogs and crabs and fish's fins</i>  |
| <b>South African Institute for Aquatic Biodiversity (SAIAB)</b><br><i>Tracking fish and sharks (and the cool technology behind it)</i>  |
| <b>South African Institute for Aquatic Biodiversity (SAIAB)</b><br><i>What is it?</i>   |
| <b>WESSA (Wildlife and Environment Society of SA) Grahamstown Branch</b><br><i>Get to know Grahamstown – a virtual tour of wildlife and environment</i>                                   |

| Start | End | Organisation<br>Title | Audience | Capacity | Price | Venue |
|-------|-----|-----------------------|----------|----------|-------|-------|
|-------|-----|-----------------------|----------|----------|-------|-------|

| TOURS - WEEKDAYS DURING SCIFEST - 7-9 MARCH & 12, 13 MARCH |       |  |     |    |                               |                      |
|--|-------|--|-----|----|-------------------------------|----------------------|
| 09h00  | 11h00 | <b>South African Institute for Aquatic Biodiversity (SAIAB)</b><br>TOURS | All | 60 | Free,<br>Booking<br>Essential | Water World<br>SAIAB |
| 10h00  | 12h00 |  |     |    |                               |                      |
| 11h00  | 13h00 |  |     |    |                               |                      |
| 12h00  | 14h00 |  |     |    |                               |                      |
| 13h00  | 15h00 |  |     |    |                               |                      |
| 14h00  | 16h00 |  |     |    |                               |                      |
| 15h00  | 17h00 |  |     |    |                               |                      |

**WEDNESDAY, 7 MARCH**

|       |       |   |          |   |     |                                      |
|-------|-------|---|----------|---|-----|--------------------------------------|
| 09h00 | 12h00 | <b>South African Institute for Aquatic Biodiversity (SAIAB)</b><br><i>Apprenticeship: Do you trust your sushi? An introduction to DNA Barcoding</i> | Gr 11-12 | 8 | R25 | SAIAB, Collections Management Centre |
|-------|-------|---|----------|---|-----|--------------------------------------|

**THURSDAY, 8 MARCH**

|       |       |   |          |   |     |                                      |
|-------|-------|---|----------|---|-----|--------------------------------------|
| 09h00 | 12h00 | <b>South African Institute for Aquatic Biodiversity (SAIAB)</b><br><i>Apprenticeship: Do you trust your sushi? An introduction to DNA Barcoding</i> | Gr 11-12 | 8 | R25 | SAIAB, Collections Management Centre |
| 09h00 | 12h00 | <b>South African Institute for Aquatic Biodiversity (SAIAB)</b><br><i>Apprenticeship: DNA unravelled</i>  | Gr 10-12 | 8 | R25 | SAIAB, Genetics Laboratory           |

**FRIDAY, 9 MARCH**

|       |       |   |                |    |     |                            |
|-------|-------|---|----------------|----|-----|----------------------------|
| 08h15 | 14h00 | <b>South African Institute for Aquatic Biodiversity (SAIAB)</b><br><i>Field trip: Where the river meets the sea</i> | Gr 8+ & Adults | 20 | R40 | SAIAB, Reception           |
| 09h00 | 12h00 | <b>South African Institute for Aquatic Biodiversity (SAIAB)</b><br><i>Apprenticeship: DNA unravelled</i>            | Gr 10-12       | 8  | R25 | SAIAB, Genetics Laboratory |

**TOURS**



|                  |   |
|------------------|---|
| <b>DATE:</b>     | 7, 8, 9, 12, 13 March   |
| <b>TIME:</b>     | 09h00-11h00, 10h00-12h00, 11h00-13h00, 12h00-14h00, 13h00-15h00, 14h00-16h00, 15h00-17h00 |
| <b>VENUE:</b>    | Water World, SAIAB  |
| <b>AUDIENCE:</b> | All   |
| <b>CAPACITY:</b> | 60  |
| <b>PRICE:</b>    | Free, Booking Essential   |

Book for a guided tour through the Water World venue, accompanied by a Scifriend (recommended for school groups).

## APPRENTICESHIPS

Spend a morning at SAIAB for a hands-on experience of what our scientists do in their day-to-day research.

### DO YOU TRUST YOUR SUSHI? AN INTRODUCTION TO DNA BARCODING



Learn about this growing programme to identify each species on the planet using DNA sequences. Struggle to identify fish species the traditional way and then see how technology can help! Learn how DNA is extracted from tissue samples and how the DNA Barcode is generated. Play around with the DNA Barcoding database and use online tools to identify species. See how easy it can be to uncover food fraud and to be a forensic scientist!

Dr Gavin Gouws is a Senior Scientist at SAIAB. He has a PhD in Zoology and interests in Molecular Biology. His research revolves around the systematics and population genetics of marine fish and freshwater crustaceans, biogeography and evolutionary biology.

<http://www.saiab.ac.za/dr-gavin-gouws.htm>

|                  |                                      |
|------------------|--------------------------------------|
| <b>DATE:</b>     | 7, 8 March                           |
| <b>TIME:</b>     | 09h00-12h00                          |
| <b>VENUE:</b>    | SAIAB, Collections Management Centre |
| <b>AUDIENCE:</b> | Grade 11-12                          |
| <b>CAPACITY:</b> | 8                                    |
| <b>PRICE:</b>    | R25                                  |

## DNA UNRAVELLED!



|                  |                            |
|------------------|----------------------------|
| <b>DATE:</b>     | 8, 9 March                 |
| <b>TIME:</b>     | 09h00-12h00                |
| <b>VENUE:</b>    | SAIAB, Genetics Laboratory |
| <b>AUDIENCE:</b> | Grade 10-12                |
| <b>CAPACITY:</b> | 8                          |
| <b>PRICE:</b>    | R25                        |

Learn more about the structure of DNA by extracting DNA from fish in our Genetics Lab, and discover how valuable DNA is for biodiversity research.

Taryn Bodill is the Molecular Laboratory Manager at SAIAB and has eleven years' experience in molecular lab techniques.

[www.saiab.ac.za/molecular-laboratory.htm](http://www.saiab.ac.za/molecular-laboratory.htm)

## FIELD TRIPS

### SAIAB

### WHERE THE RIVER MEETS THE SEA



|                  |                     |
|------------------|---------------------|
| <b>DATE:</b>     | 9 March             |
| <b>TIME:</b>     | 08h15-14h00         |
| <b>VENUE:</b>    | SAIAB, Reception    |
| <b>AUDIENCE:</b> | Grade 8+ and Adults |
| <b>CAPACITY:</b> | 20                  |
| <b>PRICE:</b>    | R40                 |

An estuary is the meeting place of a river and the sea, and is characterised by the interaction between the two. Join Professor Alan Whitfield an experienced estuarine ecologist, on his annual guided tour of the estuaries between the Great Fish and Kleinemonde Rivers, highlighting the different types of estuaries and some of the animals and plants that live in these specialised systems.

Prof Alan Whitfield is Chief Scientist at SAIAB. His research interests are centred on fishes in estuaries and he is the author of the book *Biology and Ecology of Fishes in Southern African Estuaries*.

Please note: The bus leaves promptly at 08h30 and this is a half-day excursion. Participants should bring a windbreaker, sun hat, sunscreen, a snack and drinks.

<http://www.saiab.ac.za/professor-alan-whitfield.htm>

## EXHIBITIONS

### DEPARTMENT OF FRESHWATER INVERTEBRATES, ALBANY MUSEUM EXPLORING AFRICAN FRESHWATER INSECTS

What are freshwater insects, and why are they important? We cover early discoveries of African freshwater insects, naming of species and the importance of understanding biodiversity. Learners get hands-on experience of current techniques used to distinguish species. Practical uses of freshwater insects in biological monitoring are presented.

*Dr Helen Barber-James is a freshwater biologist and Senior Curator of the National Collection of Freshwater Invertebrates at the Albany Museum, Grahamstown. Her research focuses on the systematics, biodiversity and biogeography of mayflies.*

*Mr Musa Mlambo is an aquatic biologist in the Department of Freshwater Invertebrates at the Albany Museum. His research focus is on the ecology of creatures inhabiting temporary water bodies.*

*Dr Alexandra Holland is a postdoctoral fellow at the Albany Museum where she is conducting research on the freshwater invertebrates of the Kruger National Park rivers, and the effects of pollution on the life in the rivers.*

*Dr Lyndall Pereira-da-Conceicao is a postdoctoral fellow at the Albany Museum where she is conducting research on mayflies confined to the rivers of the Southern and Western Cape of South Africa, with relatives in Asia and Madagascar, and looking for innovative modern ways to study the creatures inhabiting rivers.*

*Ms Ina Ferreira is currently based at the Albany Museum where she will complete a one-year internship funded by the NRF before registering for her PhD in Zoology at Rhodes University in 2017.*

*Ms Nonkazimulo Mdidimba is a DSRAC funded intern, working to the end of 2017 before taking up a BSc (hons) at Rhodes University in 2018. She plans to do research on dragonflies.*

*Mr Bayanda Sonamzi was an intern with the Albany Museum in 2015, and recently (2016) completed his BSc (hons) at Rhodes University. He is currently employed with the museum again, to help with databasing of information and imaging of the specimens in the museum's collection.*

<http://www.am.org.za/>



## RHODES UNIVERSITY



### DEPARTMENT OF ICHTHYOLOGY AND FISHERIES SCIENCE

#### EAR BONES IN FISH AND THEIR SECRETS

Did you know that you can tell how old a fish is by looking at tiny ear bones in its head and that scientists can look at these ear bones to tell what species it is? Experts at the Department of Ichthyology and Fisheries Science will show you an amazing variety of fish ear bones and they will explain some of their other uses in science. You will be amazed how much you can detect from these little bones. It is almost like looking back in time through a microscope.

<https://www.ru.ac.za/ichthyology/>

#### KEEPING FISH IN GRAHAMSTOWN

Come and join us at the exciting Department of Ichthyology and Fisheries Science of Rhodes University. We will show you our lively fish, how we keep them healthy, breed them, feed them and make them grow. Explore our facilities with our friendly and knowledgeable guides and leave inspired and motivated to study ichthyology.

<https://www.ru.ac.za/ichthyology/>

### CENTRE FOR BIOLOGICAL CONTROL (DEPARTMENT OF ZOOLOGY AND ENTOMOLOGY)

#### INNOVATIVE CONTROL OF INVASIVE SPECIES!

Invasive species are threats to our landscape as well as our agricultural crops. Come find out more about invasive species and how they are being controlled. Biological control is by far the most innovative way of reducing invasive species infestations. Discover how biological control and proper management techniques are keeping the invasions under control and how science can help save our environment. Learn how YOU can be an environmental steward.

<http://www.ru.ac.za/centreforbiologicalcontrol/>

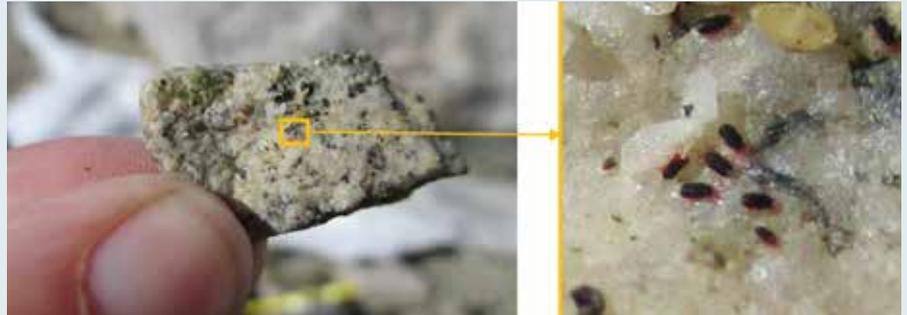


**INSTITUTE FOR WATER RESEARCH**

**WATER, THE CONNECTOR OF ALL LIFE**

What is a catchment and how do the actions of people living in a catchment affect downstream water quantity and quality for all living organisms, including people. We will also delve in the world of underground water and its dynamics. Research fields associated with the structure, function and components of natural water systems are introduced.

[www.ru.ac.za/iwr](http://www.ru.ac.za/iwr)



*"Little Critters on a rock in Antarctica"*

**MARINE NATURAL PRODUCTS RESEARCH CONSORTIUM (DEPARTMENT OF BIOCHEMISTRY AND MICROBIOLOGY)**

**THE UNSEEN MAJORITY: A WINDOW ON THE MARINE MICROBIAL WORLD**

Most of the organisms alive on our planet earth are so small they can't be seen with the naked eye. Even though they are small, these microorganisms are essential for healthy ecosystems. In the Southern Oceans for example, microorganisms (microscopic algae, bacteria, microzooplankton) form the basis of marine foodwebs. Without them, the bigger sea creatures (like the blue whales) would be very hungry indeed. In our laboratories, we use microbiology, biochemistry, virology, chemistry and botany to study these small creatures. We all work to put our pieces of knowledge together, like a jigsaw puzzle, to understand global processes. Our research on Sub-Antarctic environments allows us to understand the consequences of climate change.

[https://www.instagram.com/dorrington\\_research\\_group/](https://www.instagram.com/dorrington_research_group/)



**KEEP FIN ALIVE**

Fin is a soft shark on a mission and the mascot of the Keep Fin Alive campaign. This exhibition will take a light-hearted approach to help change the common misconception of sharks and drive more attention to shark conversation, ocean conservation and plastic pollution whilst demonstrating to the public the vital role that sharks play in keeping the oceans healthy.

[www.keepfinalive.com](http://www.keepfinalive.com)



**SAEON ELWANDLE NODE**

**WATER, THE CONNECTOR OF ALL LIFE**

As global change tightens its grip on our planet, people's lives and livelihoods are put at risk by droughts, floods, storms, heat waves, loss of biodiversity, loss of productivity and land degradation. Amidst this uncertainty, society needs reliable information to understand why and how our world is changing to help us cope with these changes and plan for the future. This is why the South African Environmental observation network (SAEON) exists.

SAEON is a National Research Facility of the National Research foundation (NRF).

Learn more about how SAEON initiates and maintains a network of observations to execute the long-term monitoring of ecosystems, and how climate change is changing our world.

[www.saeon.ac.za](http://www.saeon.ac.za)



**KZN SHARKS BOARD**

The KwaZulu-Natal Sharks Board maintains shark safety gear at 38 localities and is the only institute of its kind in the world, offering safe bathing to tourists while also conducting research into shark life history and offering a public education programme. Sharks captured in shark safety gear provide the Board with a unique opportunity to gather scientific information that will assist in the understanding and conservation of these ocean predators. This interactive exhibition explores the fast facts and murky myths about sharks. The centre piece of the exhibition is a pair of life-size shark jaws! Sink your teeth into the truth about the ocean's oldest top apex predator and its critical role in the ocean environment, and learn more about a career in marine science.

[www.shark.co.za](http://www.shark.co.za)

## SOUTH AFRICAN INSTITUTE FOR AQUATIC BIODIVERSITY (SAIAB)



### GROWING OUR OWN TIMBER!



The African Coelacanth Ecosystem Programme (ACEP) Phuhlisa Postgraduate Programme is a strategic initiative led by the Department of Science & Technology that aims to accelerate transformation of the marine science research community. Come and find out how SAIAB is “growing its own timber”, so to speak.

<http://www.saiab.ac.za/acep-phuhlisa-programme.htm>

### UNRAVELLING DNA



How can the study of DNA help us to understand the diversity of aquatic life? How can genetics improve our understanding of evolution? This display will highlight some basic principles, provide some background to genetics and present some of the tools that geneticists use in their work.

<http://www.saiab.ac.za/molecular-biology-&-systematics.htm>

### LIFE ON THE SEA FLOOR OF SOUTH AFRICA



Exploring the sea floor from the productive shallow habitats to the cold and dark expanses of the deep sea reveals a wealth of biodiversity and helps to inform and support the conservation and management of South Africa's marine environment. This exhibition will introduce you to the animals that inhabit the sea floor and to the technologies that allow us to observe them in the natural habitat. We will highlight the ecological and monetary value of the animal and mineral resources and their vulnerability to unsustainable exploitation. We will also provide an overview of South Africa's marine protected area (MPA) network and its importance to safe guard our biological heritage.

<http://www.saiab.ac.za/marine-remote-imagery-platform.htm>

### OF FROGS AND CRABS AND FISH'S FINS



The time has come," the walrus said,  
"To talk of other things.  
Of shoes and ships and sealing wax  
Of cabbages and kings  
Of chemicals and fixatives  
Of specimens and jars  
Of frogs and crabs and fish's fins  
And many stranger things!"  
-Adapted from Alice in Wonderland – Lewis Carroll

Come and find out how specimens are preserved by fixing their tissues so they do not rot and start to smell! Learn about the different chemicals used for preserving aquatic specimens for future generations. Also get to meet a stonefish, a pineapple fish, an electric ray, a giant toad!

<http://www.saiab.ac.za>

### TRACKING FISH AND SHARKS (AND THE COOL TECHNOLOGY BEHIND IT)



Fish are incredibly diverse. They come in all shapes and sizes and move in every way imaginable! Since they live underwater, it isn't easy understanding or knowing about their movements. Visit the Acoustic Tracking Array Platform (ATAP) exhibition to find out more about how scientists unravel the riddle of fish movements and migrations, how fish, sharks and rays can be tagged and tracked and learn more about this research platform.

<http://www.saiab.ac.za/atap.htm>

### WATER! WHAT IS IT?



Water is the most essential element to life on Earth. But what is water, what are the properties of water, how do these relate to aquatic life, and what makes water so important? Learn more about water at this exhibition, where you can do different experiments with water, including creating your own clouds!

[www.saiab.ac.za](http://www.saiab.ac.za)

WESSA (WILDLIFE AND ENVIRONMENT SOCIETY OF SA) GRAHAMSTOWN BRANCH

GET TO KNOW GRAHAMSTOWN - A VIRTUAL TOUR OF WILDLIFE AND ENVIRONMENT

Participants will follow a virtual tour of Grahamstown – highlighting some of the environmental and wildlife features that can be found in and around the city. They will learn about the natural history of each of the selected features. They will annotate their own map of Grahamstown to take away.

[www.ru.ac.za/environment/resources/local/wessa/](http://www.ru.ac.za/environment/resources/local/wessa/)



**DID YOU KNOW?**

BIOTECH COTTON IS NOW AVAILABLE ON THE MARKET, AND IS PLANTED OVER 9.8 MILLION HECTARES (24.2 MILLION ACRES) IN THE US, INDIA, CHINA, ARGENTINA, COLOMBIA, AUSTRALIA, SOUTH AFRICA, AND MEXICO. BIOTECH COTTON IS ENGINEERED TO BE BOTH INSECT-RESISTANT AND HERBICIDE TOLERANT.



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Science Education Centre (Science Centre)  
Private Bag X1106, Sovenga, 0727, South Africa  
[www.ul.ac.za](http://www.ul.ac.za)

**PhotoAqua kids Puppet Show**

Everywhere we go,  
People wanna know,  
Who we are,  
So we tell them,  
We are the photo,  
The photo-aqua Kids!

Do you want to meet us only when the last tree has died, the last river has been poisoned and the last fish has been caught? Come and change the world, as it takes a lot of blue to stay green!!!

*Finding solutions for Africa*