

STORE ROOM

3RD QUARTER PROGRESS REPORT

2023



KELP FOREST
FOUNDATION

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Q3 HIGHLIGHTS

July



Research conference at SANUMARC

Attending TED Countdown Summit in Detroit



MSc's participated in skipper training at NAMFI

August

University of Utrecht's research on biomarkers is being published



A new World Bank report quotes the Kelp Forest Foundation

Seabird SUNA V2 Nitrate sensor successfully deployed



Visit by H.E. Ambassador Dr Mekondjo Kaapanda

KFF joined 1% For The Planet



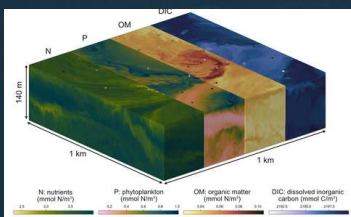
September

Arthur, first qualified commercial licensed drone pilot in southern Namibia



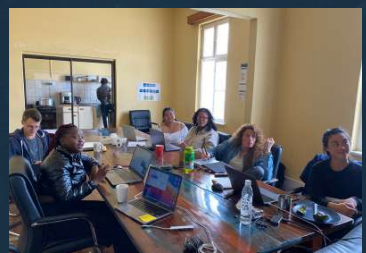
Three hot desks in The Hub, Windhoek

New scholarships offered for the Blue House Fellowship Programme



Cambridge Uni's Ocean CDR model is published

KFF Workshop held in Luderitz





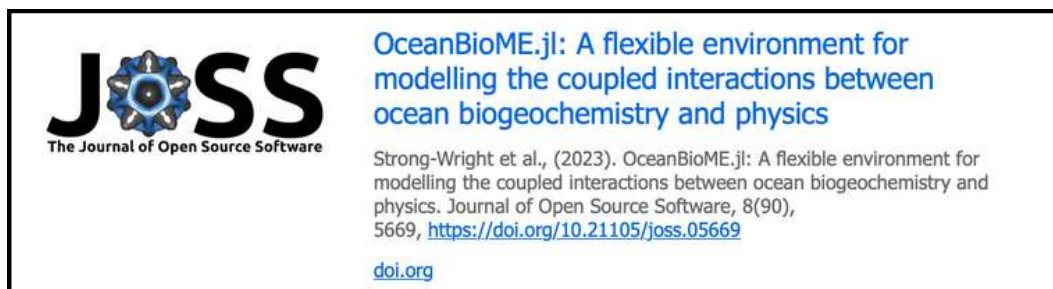
RESEARCH PROGRESS

CARBON SEQUESTRATION

1st OCEAN CDR MODEL PUBLISHED

Dr John Taylor and his team's paper describing OceanBioME, the model that they developed with the generous support we obtained from the Moore Foundation, was published in the Journal of Open Source Software! **As far as we are aware, this is the first model designed specifically to study ocean carbon dioxide removal.** We very much hope that it will become a community standard and we are excited about the ways that Cambridge University and others can use this model moving forward. This model is shared openly.

Link to the paper: <https://doi.org/10.21105/joss.05669>



As explained by Dr John Taylor of Cambridge University: "OceanBioME.jl is a flexible modelling environment written in Julia (Bezanson et al., 2017) for simulating the coupled interactions between ocean biogeochemistry, carbonate chemistry, and physics. OceanBioME.jl can be used as a stand-alone box model, or integrated into Oceananigans.jl for coupled physical-biogeochemical simulations in one, two, or three dimensions. As a result, OceanBioME.jl and Oceananigans.jl can be used to simulate the biogeochemical response across an enormous range of scales: from surface boundary layer turbulence at the sub-meter scale to eddying global ocean simulations at the planetary scale, and on computational systems ranging from laptops to supercomputers."

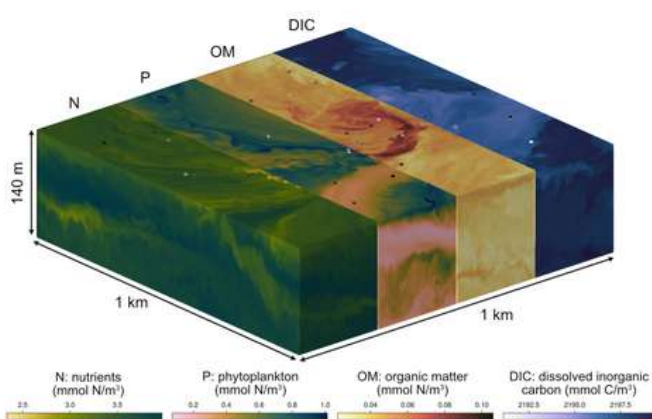


Figure 1

An example of a problem involving small-scale flow features is showcased in Figure 1, which shows a simulation of a sub-mesoscale eddy in a 1km x 1km horizontal domain with an intermediate complexity biogeochemical model and a kelp growth model solved along the trajectories of drifting buoys. OceanBioME.jl leverages Julia's multiple dispatch and effective inline capabilities to fuse its computations directly into existing Oceananigans.jl kernels, thus maintaining Oceananigans.jl's bespoke performance, memory- and cost-efficiency on GPUs in OceanBioME.jl-augmented simulations.

CARBON SEQUESTRATION

NITRATE SENSOR DEPLOYED

SEABIRD SENSOR

In the second quarter, thanks to the Ocean Born’s Foundation’s contribution, we purchased the Seabird SUNA V2 Nitrate Sensor. When it arrived, we assembled the sensor casing we made and successfully deployed it within the cultivated kelp forests. The SUNA has already begun to yield valuable real-time results giving us data that has never been consistently collected in the Luderitz area.

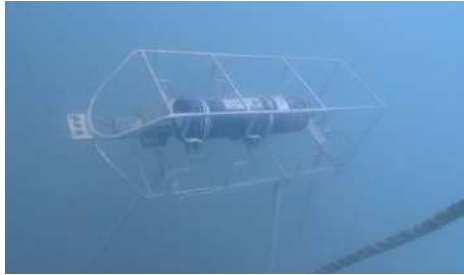
The sensor is capable of monitoring nutrient levels in the water in real-time. It measures nitrate with accuracy and stability in different environmental conditions. This sensor is a key instrument in KFF's monitoring efforts of the water geochemistry at the Kelp Blue pilot farm. Nutrient levels are important indicators for water quality and can act as a proxy for kelp growth. This will be key data for Dr John Taylor’s team to continue to develop a kelp growth model.



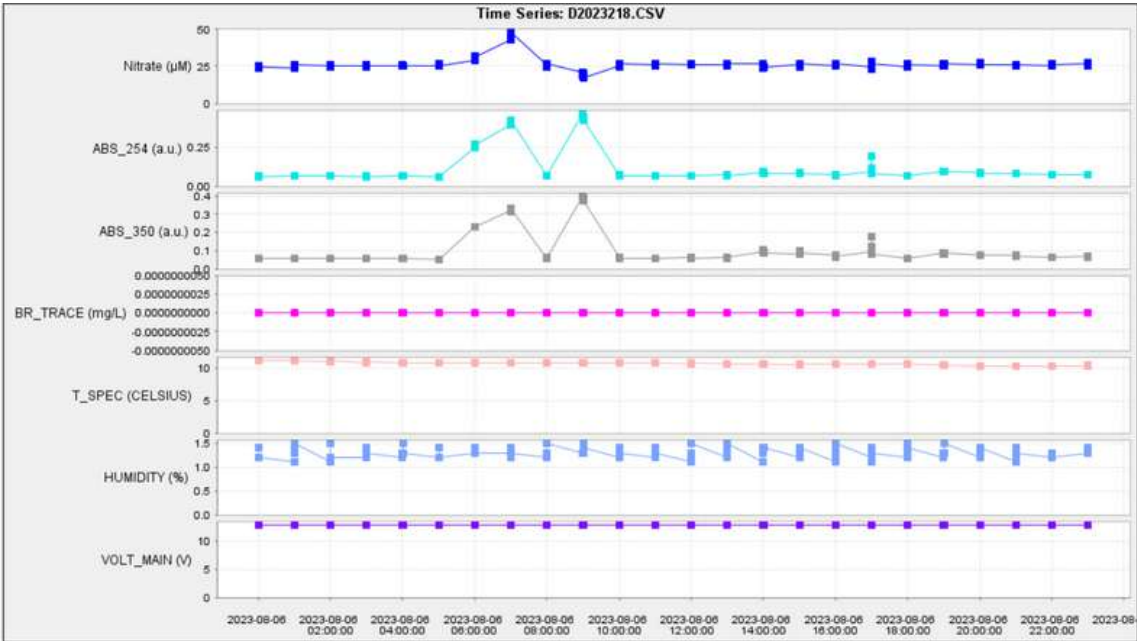
We welded a casing.



Michael inserting the SUNA in the casing.



Protasius testing the SUNA & SUNA deployed.



First set of SUNA results

CARBON SEQUESTRATION

FINGERPRINTING KELP CARBON

BIOMARKERS RESEARCH

A recent study led by Emilia Heiskanen, an MSc student at Utrecht University, investigated the potential of biomarkers from the lipids present in brown seaweed. Emilia analysed samples from three key seaweed species found in Luderitz, Namibia: *Macrocystis pyrifera* (giant kelp), *Ecklonia maxima*, and *Laminaria pallida*. Her goal was to identify unique biomarkers (molecules) containing information about these species' biological origin. Discovering the biomarkers will support our understanding of the specific role of kelp in the blue carbon cycle, as they can help us identify how much of the organic carbon found in sediment samples originated from the kelp.

Key findings:

- The compound analysis of the seaweeds focused on fatty acids and sterols. Fatty acids were found to be too common across the different seaweeds and were therefore not suitable as biomarkers.
- Fucosterol, although found in all three analysed species, had a high abundance and traceability, which highlights its potential as a biomarker for brown macroalgae, but further research is needed.
- Additional research needs to be undertaken to understand how much of the kelp carbon is stored in the sediments, on what timescales, and whether fucosterol could also be traced in deeper sediments further offshore.

Currently, Emilia's research is being developed into a publication in collaboration with her supervisors, Dr. Ir. Francien Peterse and Prof. Jack Middelburg of the Faculty of Geosciences at Utrecht University, the Netherlands.



Emilia Heiskanen, Utrecht University



Dr. Francien Peterse, Emilia Heiskanen, Prof. Jack Middelburg of Utrecht University with Xu and Samantha from KFF



Xu and Samantha delivering fresh kelp samples to Emilia Heiskanen at Utrecht University for her to undertake her research.

MSC FELLOWS

RESEARCH PROGRESS

ARISHA SEPTEMBER, FAUNA BASELINE STUDY

Under the guidance of Dr. Kolette Grobler at the Ministry of Fisheries and Marine Resources (MFMR), Arisha has commenced with the collection and analysis of zooplankton at all of the study and control sites. The analysis of zooplankton does not only contribute towards her MSc thesis, it is essential in aiding the quantification of marine fauna biodiversity at the control sites.

Additionally, Arisha has also collected eDNA samples, prepared and managed the jellyfish experiment, and analysed nutrient samples. She also attended and presented at the SANUMARC 8th annual research conference in September.



Arisha at the SANUMARC annual research conference



Arisha working on the eDNA samples.



MICHAEL MATEUS, CULTIVATED KELP FORESTS NPP

Michael is working out the last bits of his proposal in order to apply for the ethical clearance. For his research, he is estimating the net primary production of giant kelp at Shearwater Bay, Kelp Blue's pilot site. For this, he, analyses, amongst other things, satellite images (Figure 2) on which you can see the increase in the canopy of the farm.

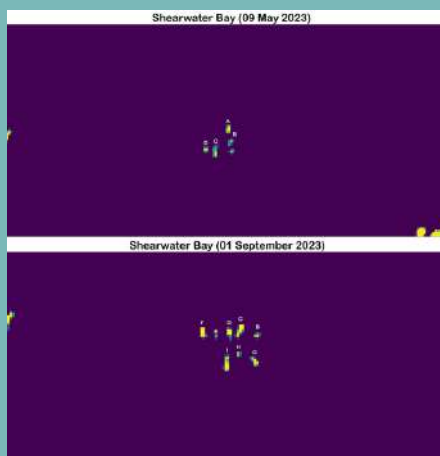


Figure 2

“ Everyone was so interested in KFF and what we do. After our presentations most of the attendees told us that our team fired up the conference. It was really an amazing week.



Michael presenting at the SANUMARC conference

MSC FELLOWS

RESEARCH PROGRESS

ANGELIQUE DODDS, ALGAL BASELINE STUDY

Angelique is approaching the end of her two-year study on the biomass of local kelp species found along the coastline of Lüderitz. She has completed her data collection and all three of her study sites have been successfully sampled, with the help of operations and dive teams.



Michael, Angelique, Arisha and Beata and calculating kelp biomass.



Angelique during her data collection in Lüderitz.

BEATA TOOLENI, IMPACT ON BENTHIC BIODIVERSITY

Beata presented her baseline study assessing the benthic macroinvertebrates at the Shearwater Bay cultivation site.



Beata and Protasius collecting sediment samples.

Sediment samples are being collected from Shearwater cultivation site and Grossebucht (control site) every month as part of Beata's thesis. Sediment collection involves the use of the Van Veen grab for offshore collection, and collection from the adjacent sandy shores using sediment corer.



Beata and Michael collecting sediment samples.

“ I learned a lot and can proudly say that I am overcoming my stage fright. Presenting at SANUMARC was a great opportunity to hear about various other studies relating to ocean health.

BIODIVERSITY

VISITORS TO THE KELP BLUE FARM

The KFF fellows are monitoring biodiversity in and around the cultivated giant kelp forests by taking eDNA samples monthly. When they go out at sea, they also keep track of and document the visitors of the giant kelp forests. In the past few months, the team has encountered some beautiful and rare species, which we have explored in-depth. You can meet some of the visitors below:

CAPE FUR SEAL (ARCTOCEPHALUS PUSILLUS)

- During the breeding season, dominant male South African fur seals establish harems of up to 40 females. After mating, female fur seals experience delayed implantation, where the embryo remains dormant for several months before the pregnancy officially begins.
- These seals have a diverse diet, including anchovies, pilchards, bearded gobies, octopus, squid, mantis shrimps, and rock lobsters, showcasing their adaptability as opportunistic feeders. Seals are not very popular with the fishing industry as they compete for fish, consuming about 2 million tonnes each year, interrupting fishing operations and sometimes damaging gear.
- Their main natural predators include great white sharks, killer whales, and southern elephant seals. Land-based predators include the black-backed jackals, brown hyenas and occasionally lions.
- Namibia is home to eight Cape fur seal breeding colonies, including three of the largest in southern Africa, where hundreds of thousands of seals gather during the pupping period. They play a crucial role in the marine ecosystem by controlling prey populations and helping maintain the balance of their coastal habitats.



SILVERTIP NUDIBRANCH



- Nudibranchs are a group of soft-bodied marine slugs belonging to the class Gastropoda, which means they are considered snails. However, during evolution, they lose their shell, although a vestigial shell is retained in the early larval stage.
- These distinct nudibranchs, commonly found in intertidal zones and shallow reefs, stand out with their vibrant colours amidst the oranges and browns found in reefs and kelp in the waters of Southwest Africa.
- They are carnivorous by nature, these silvertip nudibranchs belong to a genus that feeds on bryozoans - marine invertebrates that encrust kelp, ropes, and buoys.
- Their rhinophores, resembling delicate antlers, act as chemosensory guides for locating food and mates, and have distinct spirals toward the tips.
- The name 'silvertip' arises from the silver-tipped cerata ('horns') covering their backs, where their gills are situated.
- In the left image, you're viewing either the *Janolus capensis* or the *Janolus longidentatus* (medaillon silvertip nudibranch). These two species share very similar external features. However, a key distinction lies in their head shape; the head of the medaillon silvertip nudibranch is rounded, while that of the cape silvertip nudibranch is more conical. Additionally, another distinctive feature is their egg-laying behavior.

BIODIVERSITY

VISITORS TO THE KELP BLUE FARM



CAPE MANTIS SHRIMP (PTERYGOSQUILLA CAPENSIS)

- Among the 455 documented species of mantis shrimp found worldwide, the Cape mantis shrimp is the sole shrimp inhabitant of the Namibian coast. This creature can grow up to 20cm in length and has a pale pink body and metallic eyes. Its most distinctive feature is the second pair of thoracic appendages (its 'front legs'), which bear a striking resemblance to those of a praying mantis (hence their name). These sharp appendages have been adapted for powerful close-range combat and can inflict serious damage on creatures significantly greater in size.
- The Cape mantis shrimp is considered a key predator in many shallow habitats and they feed on shrimps, crabs, molluscs, and fish. Their most common predators are Cape fur seals, hake, and other large fish.
- Mantis shrimp have 12 to 16 photoreceptors in their eyes and they are thought to have the most complex eyes in the animal kingdom. Each compound eye is divided into three regions, which gives them trinocular vision.
- Mantis shrimp are long-living, solitary creatures that hide in rock formations or burrow intricate passageways in the sea bed. They are known to defend their territories aggressively and to display complex social behaviours. They can recognize neighbours with whom they frequently interact and some even form monogamous, long-term relationships, sustaining partnerships for over 20 years.



HEAVISIDE'S DOLPHIN (CEPHALORHYNCHUS HEAVISIDIL)

- There are 36 different species of dolphins, and Namibia is home to eleven of them, including the playful Heaviside's dolphin (see pictures), the false killer whale, killer whale (orcas), pygmy killer whale, rough-toothed dolphin, bottlenose dolphin, dusky dolphin, long-finned pilot whale, Risso's dolphin, southern right whale dolphin, and common dolphin.
- Dolphins are highly intelligent and charismatic marine mammals belonging to the family of toothed whales, which also include orcas and pilot whales.
- Dolphins produce clicks to use echolocation, a built-in sonar system that bounces sound waves off of objects to reveal their location, size, and shape. Some species can even produce up to a thousand clicks per second, helping them track their prey, primarily fish and squid.
- These marine mammals are highly social, living in pods of a dozen or more individuals and communicating with each other by means of squeaks, whistles, and clicks. Scientists have debated for decades whether or not dolphins have a language of their own, like humans, but this question has yet to be answered.



BIODIVERSITY

VISITORS TO THE KELP BLUE FARM

CORMORANT

- Cormorants, the "sea ravens" of Latin origin (from *corvus marinus*), are streamlined swimmers known for their diving skills. Unlike most seabirds, their feathers aren't waterproof, which decreases their buoyancy and allows them to dive deeper.
- Some cormorant species plunge to depths of 45 meters in pursuit of prey. After a dive, you'll often find them sunbathing with wings spread to dry, enhancing their diving abilities.
- They're skilled fish herders, sometimes working together for more efficient hunting. Kelp Blue's cultivated giant kelp farms serve as excellent habitat and shelter for many fish making it easier for cormorants to hunt for prey. They nest in colonies on cliffs, in trees, or on the ground, engaging in vibrant courtship rituals to find a mate.
- Cormorants are opportunistic feeders, dining on fish, crustaceans, mollusks, amphibians, and even small mammals, birds, and reptiles. The Kelp Blue kelp forests support a rich diversity of marine life which can provide cormorants with a varied diet, helping them meet their nutritional needs.
- Cormorants are found on all continents except for Antarctica. Namibia is home to five different species of cormorant, including the reed cormorant, crowned cormorant, white-breasted cormorant, Cape cormorant and Bank cormorant; the latter two classified as "endangered" by the IUCN. All of these species except the reed cormorant are regularly sighted around the giant kelp farms.



FLAMINGO

- Flamingos, commonly associated with vast salt flats and shimmering lakes, have also carved out a unique niche in the submerged domains of Namibia's giant kelp forests.
- With their webbed feet, resembling paddles, they gracefully navigate through the kelp. They use their long, sinuous necks to delve deep into the kelp canopy, indulging in a diet abundant with marine invertebrates, small fish, and algae.
- Flamingos are expert filter feeders, employing their uniquely shaped bills to sift nutrients from the water. This adaptation allows them to extract nourishment with precision from their aquatic habitats. Their foraging habits not only sustain their own needs but also contribute to nutrient redistribution, benefiting the entire underwater community:
 - Greater Flamingos (*Phoenicopterus roseus*) stand out with their larger size, pink bill with a black tip, and a substantial upper mandible. Their diverse diet includes marine invertebrates, small fish, and algae.
 - In contrast, Lesser Flamingos (*Phoeniconaias minor*) are characterized by their smaller stature and delicate appearance. They possess a dark maroon bill with a smaller upper mandible. These flamingos have evolved to primarily feed on algae and microorganisms thriving within the kelp forest.

SCHOLARSHIPS ON OFFER

BLUE HOUSE FELLOWSHIP PROGRAMME



The Kelp Forest Foundation's Blue House Fellowship Programme is offering three new scholarship opportunities for talented Namibian graduates to further their studies and research some of the key impacts of giant kelp cultivation in the ocean environment. Below are the identified research questions which the fellows will address:

1) Localised buffering of ocean acidification & oxygenation

- Does the Kelp Blue farm reduce ocean acidification, and to what extent?
- Which marine organism can be considered an indicator species for ocean acidification?
- What is the best monitoring setup to obtain a robust dataset that indicates kelp's effect on ocean acidification and oxygenation?
- What are seasonal (if possible) and locational patterns observed?

2) Sessile marine species attracted to the farm structure

- Which organisms attach themselves to the Kelp Blue farm and what is their ecological role?
- Which of these species are new in the environment, based on existing baseline biodiversity data?
- Did any alien species establish themselves?
- Analysis of abundance as indicators of conditions
- How do the sessile species impact the carbon balance of the kelp farm (if possible)?

3) Spawning and nursery processes

- Does the Kelp Blue farm function as a spawning area, nursery and/or effective juvenile habitat for a specific commercially viable species (to be selected)?
- What locational patterns can be discovered in spawning and nursery activities and how does the farm compare with other local ecosystems?
- What framework and methodology should be used for future studies of these ecological functions?
- What do the presence of juvenile species say about the impact on biodiversity?

CAPACITY BUILDING



CAPACITY BUILDING UNDER 25 TON SKIPPER COURSE

Our team of MSc scientists, Michael Mateus, Arisha September, and Beata Tooleni, participated in essential sea safety and skipper training at NAMFI, the Namibian Maritime And Fisheries Institute. Our capacity-building programme is designed to equip our scientists with the vital skills needed for conducting their research in a marine environment. Our students successfully completed the course.

The course covered a range of topics:

- Use of the immersion suit and executing water entry from a height
- Life raft inflation procedures
- Familiarisation with safety equipment aboard vessels
- The 25-ton skipper training, focusing on navigation, international vessel communication language and protocols, vessel components, marine route markers, and the use of VHF (Very High Frequency) radios



Learning how to use the immersion suit.



Beata Tooleni's skipper training certificate.



All MSc's at the NAMFI skipper training.

CAPACITY BUILDING

SANUMARC RESEARCH CONFERENCE

Call for Abstracts and Announcement of the
8th ANNUAL RESEARCH CONFERENCE OF THE SAM NUJOMA MARINE AND COASTAL RESOURCES RESEARCH CENTRE, University of Namibia.

4 – 7 September 2023 | Walvis Bay, Namibia
"Collaborating for a Sustainable Future: Researching Marine and Coastal Resources in a Changing Climate"

Abstracts are due on **7 August 2023**, please submit abstracts to: sanumarcconference@unam.na
For enquiries: Dr H.A. Mupambwa hmupambwa@unam.na; Dr H.O.N. Najoula hndjoula@unam.na; or call +264 64 502 600

The ENGAGED@ University 30
www.unam.edu.na

Three of our MSc fellows, Arisha September, Michael Mateus and Beata Tooleni, recently showcased their research around the impact of giant kelp cultivation at the 8th Annual Research Conference of the Sam Nujoma Marine and Coastal Resources Research Centre, University of Namibia, held from September 4-7, 2023, in Walvis Bay, Namibia. The conference's theme was "Collaborating for a Sustainable Future: Research in Marine and Coastal Resources in a Changing Climate."

The conference featured a total of 45 presentations, centred around four key topics relevant to the Southern African seas:

1. Fisheries, aquaculture, and food security.
2. Ocean governance and coastal zone management.
3. Research and innovation in marine and coastal environments.
4. Food industries and social development in marine and coastal spheres.

The event was an enlightening experience for our students and we're proud to congratulate Beata for earning one of the top three best presentation awards.



Arisha, Beata and Michael



All attendees of the 8th Annual Research Conference of SANUMARC.

Distinguished attendees included UNAM professors and students, scientists, and esteemed guests like Dr. Moses Amweelo, former Minister of Works, Transport, and Communication of Namibia, and Ms. Saara Mutondoka, Deputy Mayor of Walvis Bay, representatives from the Ministry of Fisheries and Marine Resources, Dr. Mundia (Director of Research and Innovation, Ministry of Higher Education), and South African universities, including the University of KwaZulu-Natal, added to the conference's rich diversity

CAPACITY BUILDING

MIRABILIS PRACTICAL DEMONSTRATION



Beata and Michael on the Mirabilis RV.



Michael, Arisha and Beata on the Mirabilis RV.

While attending the conference in Walvis Bay, Arisha, Beata and Michael had the amazing opportunity to visit the Mirabilis RV, a Namibian government-owned research vessel used for various offshore data collection trips. Ms Meriam Mwiya, director of the Namibian Maritime and Fisheries Institute (NAMFI), took the MSc's aboard the Mirabilis RV for a practical demonstration of the navigation lessons they learned during the Under 25 Ton Skipper course.

The vessel was equipped with scientific and acoustics labs, a gym, a laundry room and a lounge area. The visit to the vessel was important as they were able to ask the necessary questions as well as apply the valuable skills learned throughout the training.



Beata, Michael and Arisha together with Mr Vilho Hango captain on Mirabilis and Mrs Meriam Mwiya, director of NAMFI.

CAPACITY BUILDING

SUCCESSFUL DRONE TRAINING

Arthur Likando, a KFF apprentice, has become the **first qualified commercial licensed drone pilot in southern Namibia** having recently completed his Commercial Drone License training in Swakopmund! With the images taken from his drone, Arthur helps map the kelp forests which is essential in understanding their growth rates.



Arthur Likando with Mr Dylan Katzao, drone license examiner.

The Namibian Drone Academy in Namibia is the only recognised institute that offers commercial remote pilot licence training to equip drone pilots with adequate knowledge of safe drone operations, drone registrations procedures, Namibia CARS and CATS, meteorological aspects, air navigation as well as physical and mental health of the operator. It provides theoretical and practical sessions completed in 3 weeks. The training also requires a medical class 3 certificate, a Radio & Telephony Licence and an English Proficiency Licence, that must be obtained separately before obtaining the commercial licence.

It is of vital importance to be equipped with this knowledge in order to know how to handle risks at hand, know rules and regulations of the country when doing operations, understanding how the drone works, how to retrieve a drone safely as well as know how to communicate via radio with other airspace users. Operating a drone in Namibia requires one to be a registered pilot and the drone must itself be registered by NCAA (Namibian Civil Aviation Authority).



Arthur photographed with Mr Enos Mutyavaviri, restricted radiotelephony license examiner at NATA

CAPACITY BUILDING PROTASIUS AT CAG29

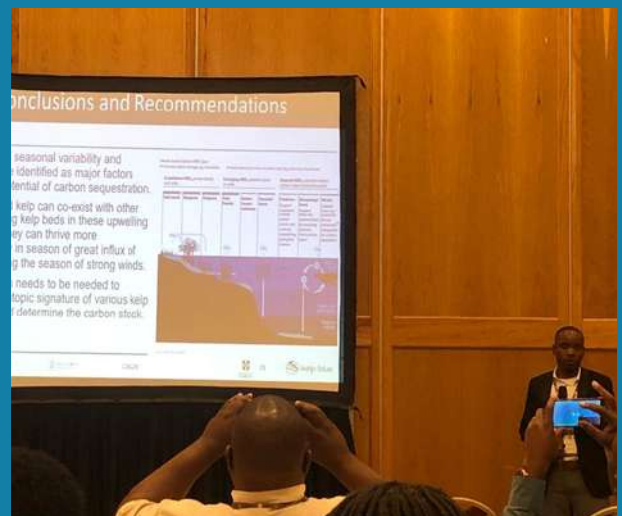
Protasius Mutjida, a KFF fellow, attended the 29th Colloquium of African Geology (CAG29) (26th - 29th September, 2023). CAG is a major biennial meeting organised under the auspices of the Geological Society of Africa (GSAf). Professor W. Q. Kennedy, assisted by Dr. Tom Clifford, convened the very first CAG at the University of Leeds, England, in March 1964. CAG29 was hosted in Namibia and for the first time organised by the Geological Survey of Namibia, a division within the ministry of Mines and Energy. The chairperson of the CAG29 was Ms. Anna Nguno and the patron was Dr. Leake Hangala, current president of the African Geology Society.

This colloquium attracted more than 300 speakers in the various field of geology who submitted their abstracts for review prior to the conference. The theme of the conference was: "The earth sciences and Africa's development: current realities, future projections"

The meeting was very pivotal for us to showcase our groundbreaking work developing geochemical baselines. The theme of the conference it was in tune with the new development of climate action in Namibia as well as the African continent. Our work to further the research to quantify the amount of CO₂ sequestered by the kelp forests was very well received.



Protasius presenting at the CAG29 conference.



“

I learned a lot and connected with knowledgeable geoscientists from across the world, and I was able to present the work we are doing to different government officials that were excited to hear there is a baseline being created. What stood out for me is the amount of research topics in geology that are aimed at combating and looking into climate action including hydrogeology, environmental geology and engineering geology.

OCEAN EDUCATION



OCEAN EDUCATION

KFF-SPONSORED ACTIVITIES



EXTRA-CURRICULAR PROGRAMME

The extra-curricular programme at the Blue School, funded by KFF, continues to expand. The School now offers the **Adventure Club** for the younger age group not yet old enough for **Strandcubs**, and **Lego** as the preparation for **Robotics**. They have been joined by a new science teacher - Ms Imogine Dausas - who has started up an explosive **Science Club** with a strong focus on practical experiments, backed up by the science behind the magic.

OCEANS' DAY



Practicing photography in the Van Gysen garden.

The highlights of this past term include learning photography with Arthur Likando followed by a follow up session where the **Strandcubs** had the chance to put into practice what they had learnt in the magical surroundings of the Van Gysen garden.



Arthur teaching speaking to our young future photographers.

OCEAN EDUCATION

KFF-SPONSORED ACTIVITIES



Kids from the Blue School bodyboarding.



SURF'S UP

Another major highlight was going to Agate Beach with the marine monitoring interns to have a go at surfing and bodyboarding. This was a big hit with everyone and the team will definitely repeat as soon as the weather is a bit warmer.



Marine Monitoring interns taking the kids surfing.

FUTURE GARDENERS

Michael Mwinga, the agronomist from Kelp Blue, helped to set up the Blue School's garden using cocopeat (fibres from coconut husks that retain water well) and shade nets to prepare it for the Lüderitz climate. They will also be testing the Kelp Blue Stimplus+ (kelp biostimulant) on the crops! Many of the Kelp Blue team helped to construct the shade nets and set up the planters from old pallets donated by Novanam. The first harvest is already ready and the children have eaten turnips, beetroots, spinach and beans grown from seed. The cooking club used some of the first harvest to create a delicious meal - showing the children the full process from farm to table.



The cooking club showing what they harvested & during harvesting.

OCEAN EDUCATION

KFF-SPONSORED ACTIVITIES



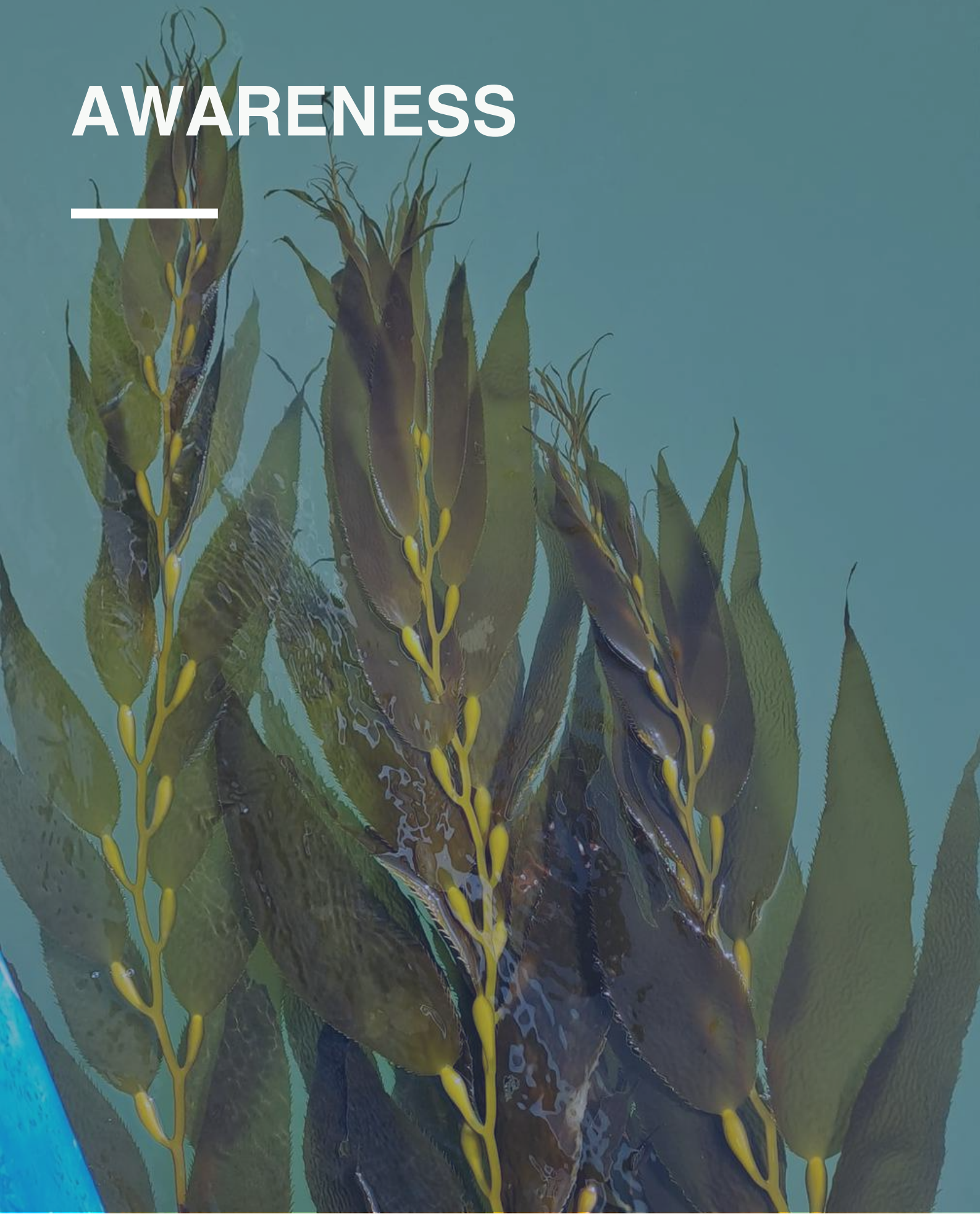
SOAP MAKING

The Blue School had a first test of making soap with kits donated by the Kelp Forest Foundation - with the help of intern Georgia Rengers and Aina Iyambula from Kelp Blue. The kids enjoyed the hands-on learning experience. The soaps are now resting before they are ready to be used. The next step is to design suitable packaging and sell them at our next fundraising event.



Intern, Georgia Rengers, helping students to make the soaps.

AWARENESS

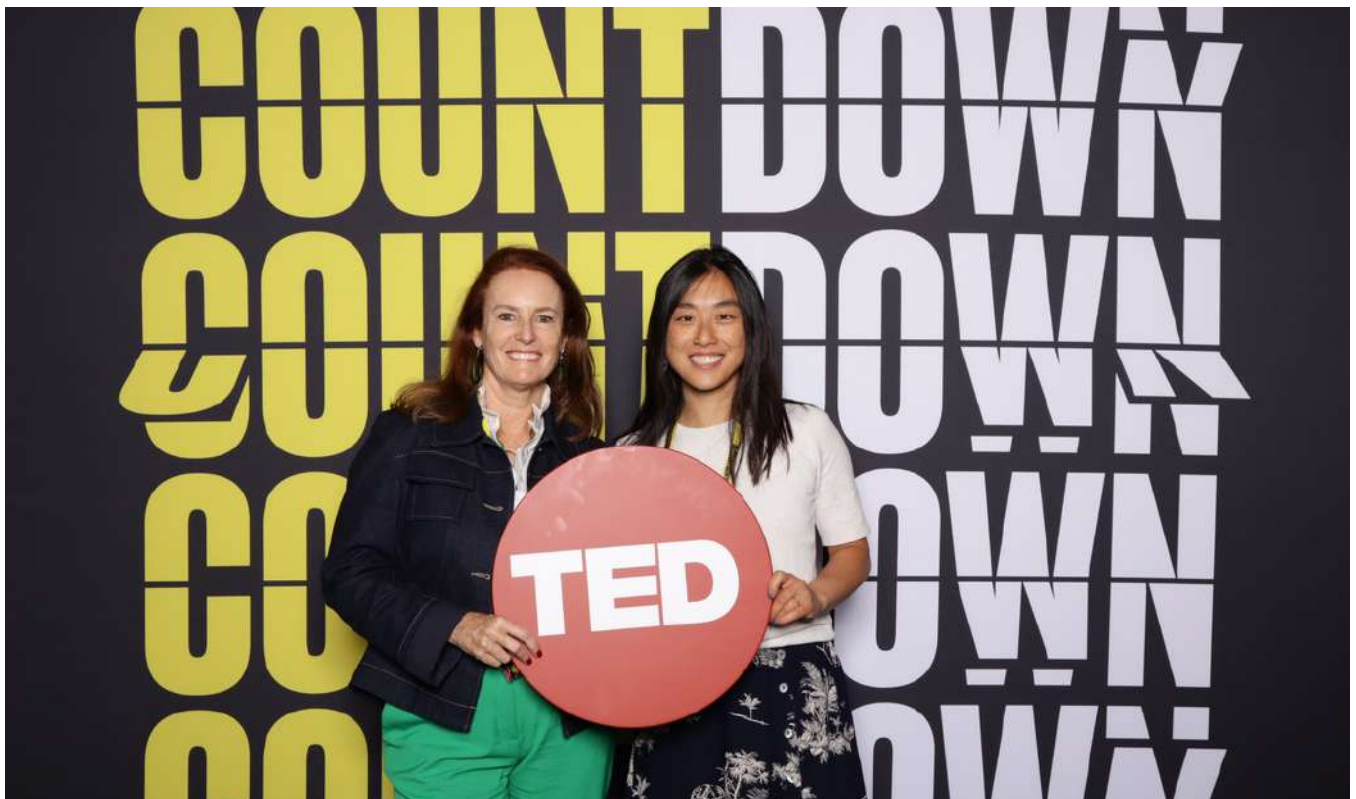


TED COUNTDOWN SUMMIT



Samantha Deane and Xu Ben Zhang attended the TED Countdown Summit, an invite-only climate conference organised by TED Conferences, which took place in Detroit in July of this year.

Xu and Samantha had the opportunity to listen and meet some remarkable presenters. These included over 750 global innovators, business leaders, scientists, policymakers, artists, and activists. The conference focused on the role of business in accelerating solutions to the climate crisis and transforming the global economy. They learnt how some companies are efficiently transitioning their products to zero carbon, developing sustainable business opportunities, sparking momentum toward solutions and sharing their success stories to inspire others whilst also being candid about the barriers they encounter to progress.



Samantha Deane (Managing Director) and Xu Ben Zhang (Project Manager) at the TED Countdown.

PUBLIC AWARENESS

KFF QUOTED IN GLOBAL SEAWEED REPORT

NEW AND EMERGING MARKETS REPORT

KFF was referenced several times in a new World Bank report on Global Seaweed New and Emerging Markets 2023 which examines 10 emerging seaweed markets. The report guides entrepreneurs, investors, and policy makers worldwide to capitalise on the potential of the seaweed sector and estimates that their growth potential of this market could be up to US\$11.8 billion by 2030.

Listed among the case studies that investigate seaweed in blue carbon strategies, the report highlights our work in quantifying the ecosystem services of giant kelp (*Macrocystis pyrifera*), and the carbon credit methodology development for giant kelp afforestation by our foundation, together with Carbonomics, Gold Standard and Kelp Blue (pageS 134 & 142).

Our work with NatureMetrics at the Kelp Blue pilot offshore kelp farm is also highlighted as a case study that investigates seaweed for biodiversity and habitat provisioning. In this project, we monitor the increase in biodiversity at the kelp farm using eDNA (page 139).

Our infographic, featured on page 145, illustrates seaweed cultivation's potential as a nature-based solution to climate change, bioremediation, marine habitat provisioning, and more.

Link to the report: <https://www.worldbank.org/en/topic/environment/publication/global-seaweed-new-and-emerging-markets-report-2023>



DEVELOPING HIGH-INTEGRITY MARINE NATURAL CAPITAL MARKETS IN THE UK REPORT

Samantha was invited by the Blue Marine Foundation and The Crown Estate to participate in a multi-stakeholder workshop, run by Finance Earth and Pollination in London. The workshop's first outcome was this synthesis report which highlights key barriers to scaling high integrity marine natural capital markets in the UK and presents early recommendations to help unlock growth across the sector. The report was based on consultation with nearly 100 stakeholders. The next phase of work will be to develop the roadmap. Samantha was happy to contribute to the role that seaweed cultivation and restoration can play within the sector.

Link to the report: <https://finance.earth/wp-content/uploads/2023/09/Developing-High-Integrity-Natural-Capital-Markets-in-the-UK-Final.pdf>



OTHER NEWS

OTHER NEWS

VISIT BY H.E. AMBASSADOR KAAPANDA

Her Excellency Dr Mekondjo Kaapanda-Girrus, Namibia's Ambassador to Belgium, the Netherlands & the European Union and her colleagues Mr Kleopas Sirongo, Counsellor (Trade and Industry) and Mr Andre Apollus, Counsellor (Agriculture) visited the Kelp Blue and Kelp Forest Foundation offices in Amsterdam. They were interested in knowing more about our work in Namibia and to find ways to help strengthen the Namibian/Dutch ties even more.



Mr Kleopas Sirongo, Caroline Slootweg, Dr. Kaapanda, Elianne Oei, Cayne Moffat, Maxime Penning, Andre Apollus, Samantha Deane and Ferdi Knoester.

RETURN ON INSPIRATION



Casimir speaking to Laura van den Heuvel (Intern at KFF).

We were honoured that 16-year old Casimir chose the Kelp Forest Foundation to undertake his school's required 5-day internship as part of his GCSE curriculum. Casimir was asked by us to uncover and illustrate the 36 ecosystem services (based on Dr Thierry Chopin's research) that kelp forests provide us for free and create a presentation that he could share with the other students of his school's Global Good programme. He did a stellar job and promised to be our young kelp ambassador!

KFF WORKSHOP



The Kelp Forest Foundation held its annual in-person workshop in Lüderitz, Namibia in September. We worked hard on sharpening our vision and mission, budgets and present and future focus areas. Everybody got a chance to present their current areas of work and shared the areas where they needed help to achieve their goals.

OTHER NEWS

KFF VISIT TO NUST

Whilst in Windhoek, Dr. Tiffany Stephens and Samantha Deane visited our friends at the Namibia University of Science (NUST). They discussed many areas of research collaboration as well as the three upcoming scholarship opportunities for Namibian students to undertake a Masters in Science around three different impacts of giant kelp cultivation.



Dr. Tiff Stephens (KFF) and Samantha Deane (KFF) visiting the Namibia University of Science and Technology (NUST).



Dr. Tiff Stephens (KFF), Dr. Jonathan Kamwi (NUST), Bas Rijnen (NUST) and Samantha Deane (KFF).

COLLABORATING WITH OTHER NGO'S AT "THE HUB"

Dr Tiffany Stephens and Samantha Deane were invited to visit "The Hub" and the new WWF Namibia offices where KFF is lucky enough to have three "hot desks" from which to work from in Windhoek. With its conservation partners, WWF is building a Community Conservation and Inspiration Hub ("The Hub") in Windhoek. Located near the Namibia University of Science and Technology (NUST), the Hub is envisioned as a place where young people can learn about conservation, with access to information sources and first-hand knowledge from experts in the field.



Pauline Lindeque (WWF), Dr Tiff Stephens (KFF), Monique Wilkens, (WWF) and Samantha Deane (KFF) visiting The Hub site.



WWF Namibia (nearly finished) HQ in Windhoek.



KFF's new flexible spaces in an office within The Hub premises.

OTHER NEWS

1% FOR THE PLANET

The Kelp Forest Foundation has recently joined 1% for the Planet as a non-profit Environmental Partner.

1% for the Planet is a global network that connects businesses that wish to help make positive environmental change to environmental non-profits actively making that change happen. Started in 2002 by Yvon Chouinard, the founder of Patagonia, and Craig Mathews, the founder of Blue Ribbon Flies, this network has contributed hundreds of millions of dollars to environmental partners to date. Business members pledge 1% of their sales towards supporting environmental partners like Kelp Forest Foundation.



TITRATION MACHINE THANKS TO A GRANT FROM SOA

KFF fe, Protasius Mutjida, was able to acquire a titration machine needed for his research thanks to the kind contribution of the Sustainable Ocean Alliance (SOA). SOA supports youth-led grassroots projects all over the world and this grant forms part of SOA's Greenhouse Gas Reduction efforts. Titrators are used to determine an unknown concentration of a known substance in a sample. The basic principle of the titration is the following: A solution – a so called titrant or standard solution – is added to the sample to be analyzed. The automated titrator will be used to measure for total alkalinity (TA) which is a key part in developing a CO2SYS, a key component in quantifying the amount CO2 in the water. The titration machine is important for the development of our kelp Carbon Dioxide Removal (CDR) model because it will help us measure water alkalinity and acidity as well as determine the concentration of dissolved inorganic carbon (DIC).





KELP FOREST FOUNDATION

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