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PROBLEM TO BE SOLVED

The Sharks/Humans Conflict



Human Safety



Loss of tourism revenue



Environmental Impact



Tourism damage (e.g. Reunion Island)

- 40% reduction of tourism bookings after each shark attack
- Beaches closure and suspension of surfing events
- **20 Mil EUR loss per year** in tourism revenue*



*Source: http://www.info-requin.re/IMG/pdf/Impact_economique_crise_requin_a_la_Reunion_-_Sagis_-_Rapport_final_novembre_2014.pdf

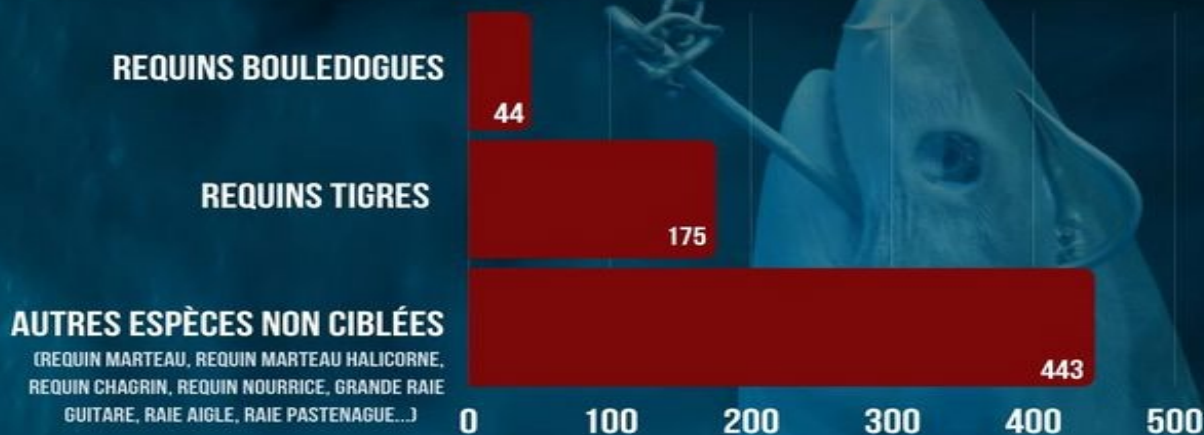


Environmental Damage

- ▶ Shark-cull policies introduced to reduce the number of sharks around recreational beaches;
- ▶ Deployment of shark-nets and drumlines;
- ▶ **66%** of the marine animals killed are not dangerous sharks;
- ▶ 40% of the marine animals killed are not sharks.



BILAN DES CAPTURES* DU PROGRAMME RÉUNIONNAIS DE PÊCHE DE «PRÉVENTION» ENTRE MARS 2018 ET DÉCEMBRE 2020



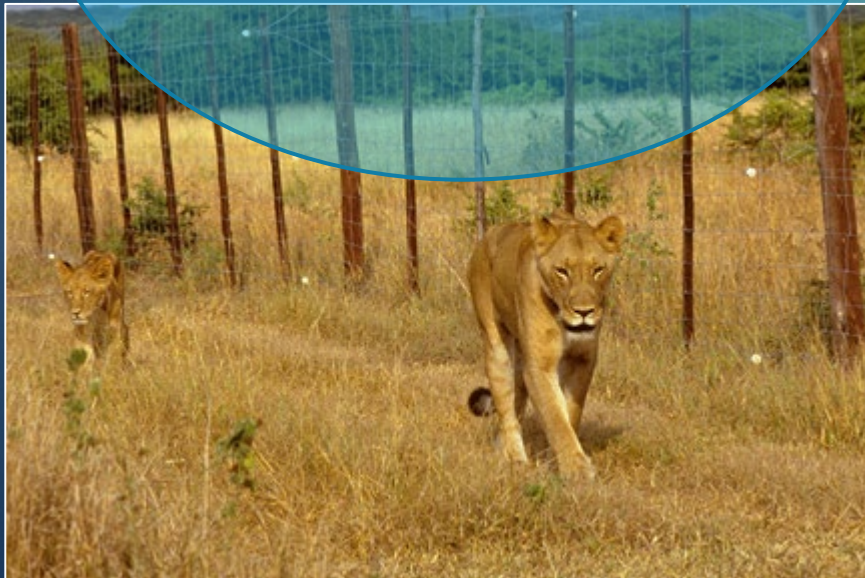
*NOMBRE D'INDIVIDUS CAPTURÉS PAR LES DISPOSITIFS : FILAGES ET PALANGRES (PAVAC & PHF)
SOURCES : LINFO.RE & RAPPORTS TRIMESTRIELS DU PROGRAMME RÉUNIONNAIS DE PÊCHE DE PRÉVENTION



NEED FOR A SUSTAINABLE WAY TO ADDRESS TOP-PREDATORS MANAGEMENT

1

KEEP PREDATORS
SEPARATED FROM PEOPLE



2

IMPLEMENT A LONG-TERM
MONITOR AND
MANAGEMENT SYSTEM





Solution: a physical barrier that protects humans and doesn't kill marine life



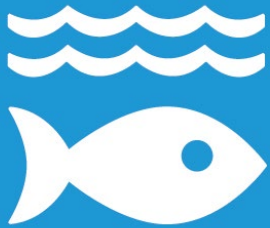
The SharkSafe Barrier™

- South African Technology;
- Only Eco-Friendly and shark specific solution available on the market;
- Built from recyclable plastic and reusable ceramic magnets;
- Proven minimal maintenance cost;
- Contributes to biodiversity as it creates an artificial reef;
- Scientifically tested;
- Allows for safe surfing, swimming and scuba diving activities



SharkSafe Barrier™ aligns with UN Sustainable Development Goals

14 LIFE BELOW WATER



Sharks maintain the natural balance in marine ecosystems. Their protection fosters healthier ocean biodiversity.

8 DECENT WORK AND ECONOMIC GROWTH



Eco-friendly tourism strengthen the coastal economies through environmentally responsible solutions.

13 CLIMATE ACTION

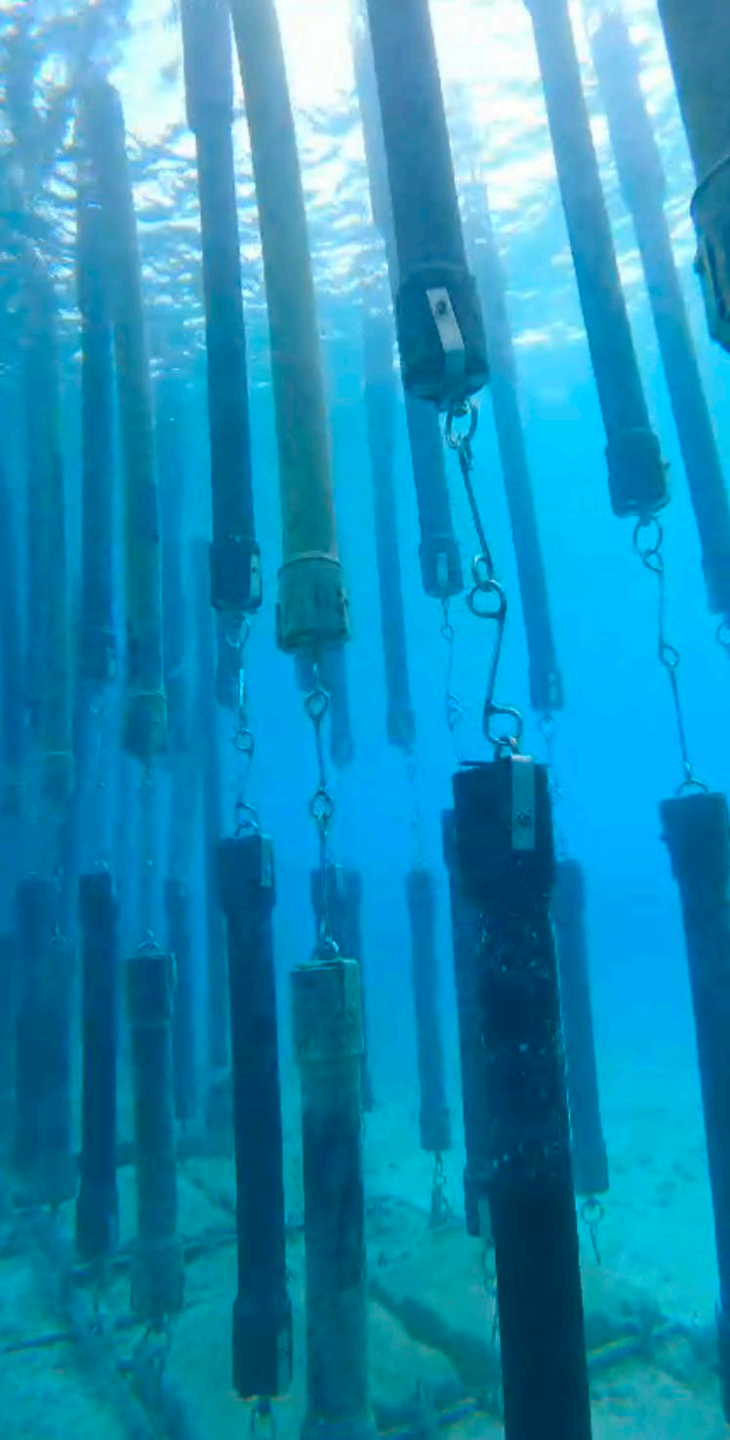


Ocean biodiversity is crucial for carbon sequestration and ecosystem resilience.

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE



Innovation in eco-friendly marine technology promotes inclusive industrial growth through environmentally responsible practices.



A cost-effective and impactful investment in marine conservation and eco-tourism

SharkSafe Barrier™ is currently protecting 8,000 square meters of pristine marine habitat in the Bahamas for just 15 USD per square meter!

The SharkSafe Barrier™ is designed for longevity, offering a predicted lifespan of up to 20 years

SharkSafe Barrier™

Patented* South African Technology

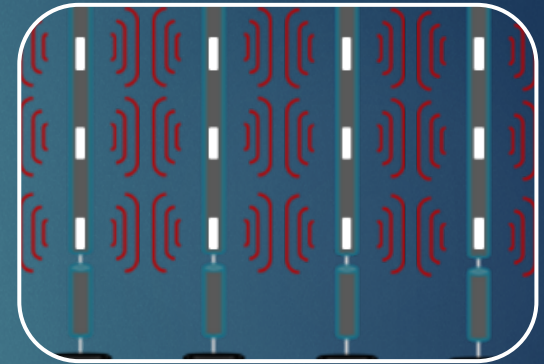


Visual Barrier

- Biomimicry – Kelp Forest
- Nature inspired to be strong against waves



- Shark-specific and safe for marine life
- Robust & Eco-friendly design
- 100% successful bull sharks and white sharks!



Magnetic Barrier

- Overwhelms the shark's electromagnetic sense
- Effective in low visibility
- Shark-specific

*PATENTS LINKS:

[US9963209B2 - Shark barrier - Google Patents](#)

[US10883239B2 - Shark barrier - Google Patents](#)

Scientific Publications

1. Highly motivated white sharks can be excluded from an area by the Sharksafe Barrier:

O'Connell C.P., S. Andreotti, M. Rutzen, M. Meÿer, C.A. Matthee 2017. Testing the exclusion capabilities and durability of the Sharksafe Barrier to determine its viability as an eco-friendly alternative to current shark culling methodologies. *Aquatic Conserv: Mar Freshw Ecosyst.* 2017;0:1–7. <https://doi.org/10.1002/aqc.2803>

2. White sharks can be deterred by strong barium ferrite magnets and a visual barrier:

O'Connell, C. P., S. Andreotti, M. Rutzen, M. Meÿer, and P. He. 2012. The use of permanent magnets to reduce elasmobranch encounter with a simulated beach net. 2. The great white shark (*Carcharodon carcharias*). *Ocean & Coastal Management* 97:20–28.

3. Bull sharks can be deterred by strong barium ferrite magnets:

O'Connell, C. P., S.-Y. Hyun, S. H. Gruber, T. J. O'Connell, G. Johnson, K. Grudecki, and P. He. 2014. The use of permanent magnets to reduce elasmobranch encounter with a simulated beach net. 1. The bull shark (*Carcharhinus leucas*). *Ocean & Coastal Management*.

4. Highly motivated white sharks don't swim through the Sharksafe Barrier

O'Connell, C. P., S. Andreotti, M. Rutzen, M. Meÿer, C. A. Matthee, and P. He. 2014. Effects of the Sharksafe barrier on white shark (*Carcharodon carcharias*) behavior and its implications for future conservation technologies. *Journal of Experimental Marine Biology and Ecology* 460:37–46.

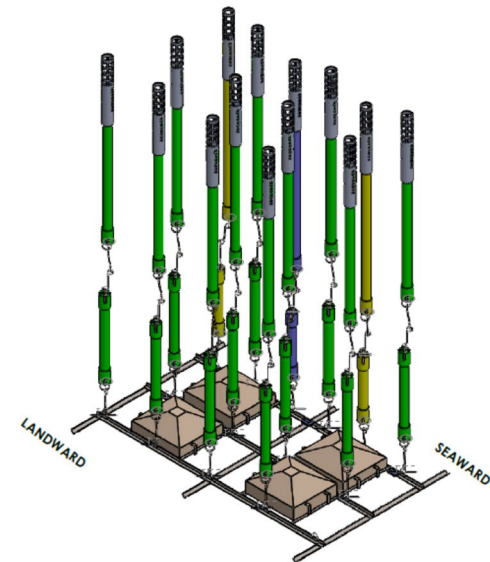
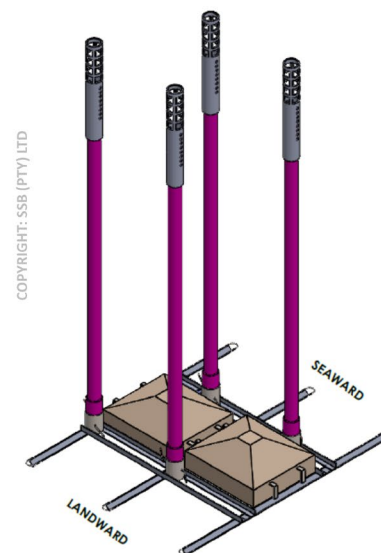
5. Highly motivated bull sharks can be excluded from an area by the Sharksafe Barrier

O'Connell, C. P., S.-Y. Hyun, C. B. Rillahan, and P. He. 2014. Bull shark (*Carcharhinus leucas*) exclusion properties of the sharksafe barrier and behavioral validation using the ARIS technology. *Global Ecology and Conservation* 2:300–314.

Design

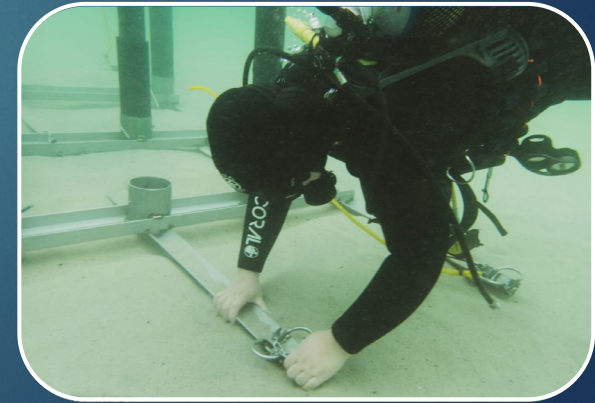
► Three rows of SharkSafe Barrier Units to biomimic a thick forest of kelp in deep water (contains magnets on the outside row of Units);

► Two rows of SharkSafe Barrier Fences in shallow water (all containing magnets)



Eco-Friendly Anchors Design

- Standard grid system for quick installation;
- Adaptable system for all substrates;
- Tested in high energy waters;
- Very durable.

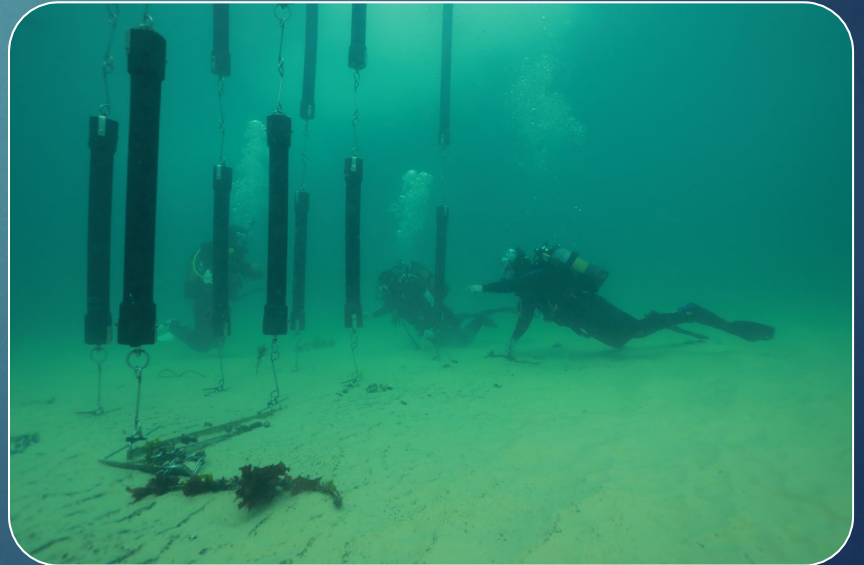


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GRID IN DEEP SAND

PHOTOS: NICOLENE OLCKERS – MACKREL BEACH (FALSE BAY)
















GRID IN SHALLOW SAND AND ROCKS



Inspired by the
wave - resistant
shape of limpets

Comparison with the alternatives

	PRODUCTS	ECO-FRIENDLY 	SHARK SPECIFIC 	PHYSICAL BARRIER 	CHEAP MAINTENANCE 	BOAT FRIENDLY 
	SHARKSAFE BARRIER	✓	✓	✓	 ✓	✓
	EXCLUSION NET	✓	✗	✓	 ✗	✗
	ECO-BARRIER	✓	✗	✓	 ✗	✗
	SMART DRUMLINES	✗	✓	✗	✗	✓
	SHARK NETS	✗	✗	✗	✗	✗

- The installation cost per linear meter of SharkSafe Barrier is ca 2 times more expensive than exclusion nets, but the maintenance cost is 20 times cheaper per year
(*calculated on existing exclusion net program in Reunion)



Supply Chain Diagram

SharkSafe Barrier Pty is a very lean company that relies on sub-contractors hired per project;

The manufacture of the magnetic posts is undertaken in South Africa, for ensuring a closely-supervised quality control and IP; there will also be local procurement for the likes of the 'limpets'

The installation and maintenance team will be sourced locally, and trained by SharkSafe Barrier Pty representatives.

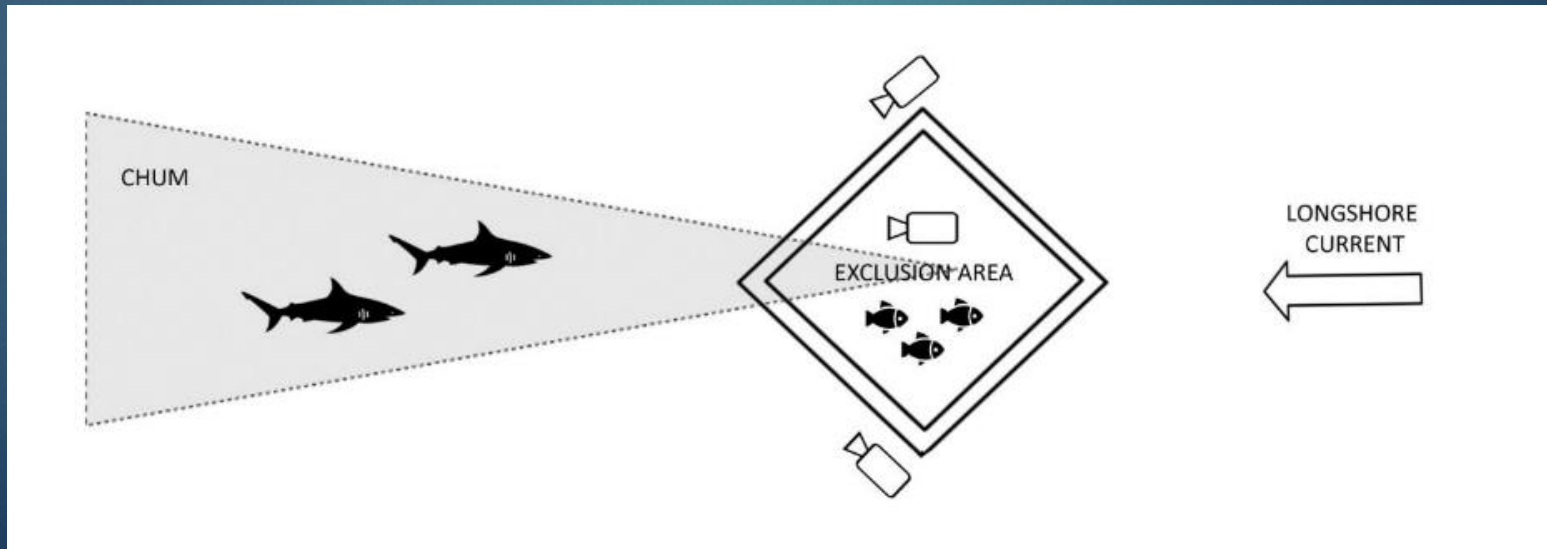
The trained local team will then be responsible for on-going monitoring and maintenance of the installation.

Additional Details

- ▶ **Maintenance:** a local team will be trained for cleaning the Units on an on-going bases.
- ▶ **Monitoring:** the integrity of the installation can be monitored from the beach or from an the elevated position, with binoculars, since the SSB Units are visible above the water surface.
- ▶ **Magnets:** the magnetic field is detected by sharks only and do not pose a risk to human health (see documents attached). **No electricity is involved.**
Reusable overtime (ca 100 years lifespan, don't rust)
- ▶ **Boats: can pass through the SSB** without damaging the propellers nor the SharkSafe Barrier Units.
- ▶ **Entanglement:** the vertical design of the Units doesn't pose an entanglement hazard for marine animals nor for beach goers.

Example of existing SharkSafe Barrier installations

- 200 Units for independent bull shark exclusion test in St Paul (Reunion Island)
- Test in collaboration with the Centre Securite Requin in Reunion
- Product exported and installed in **January 2019**
- **During installation (24 months) minimal maintenance on SSB Unts was required.**



4 February 2019 – April 2021



Minimal maintenance needed

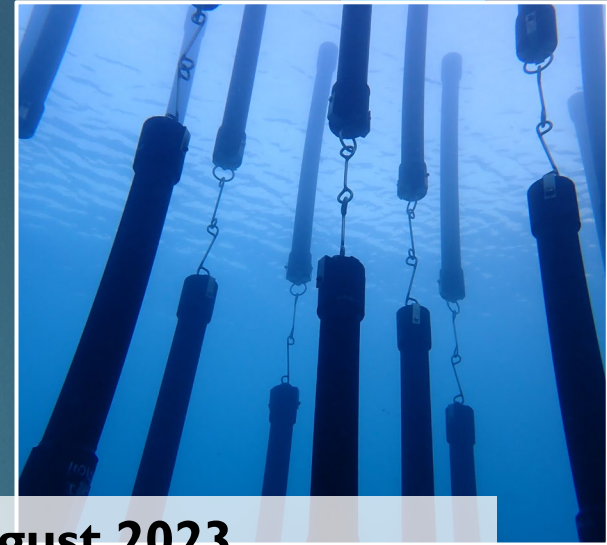
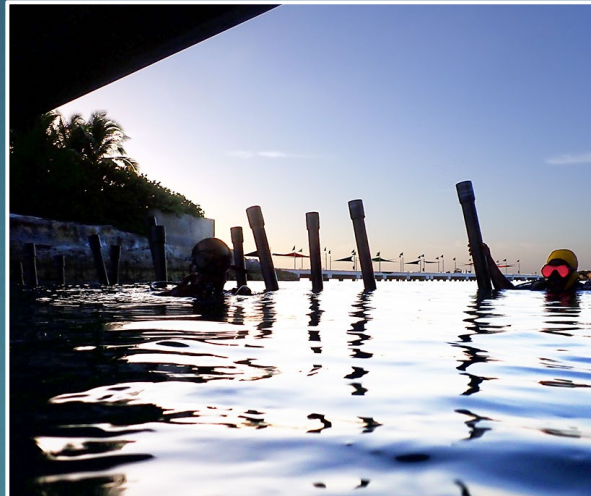
A dive-site attraction



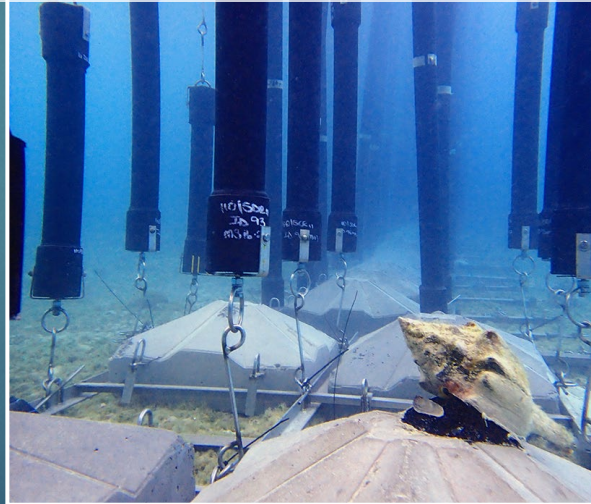
SharkSafe Barrier Installation in St Paul (Reunion)
Photos taken on the 23 September 2020



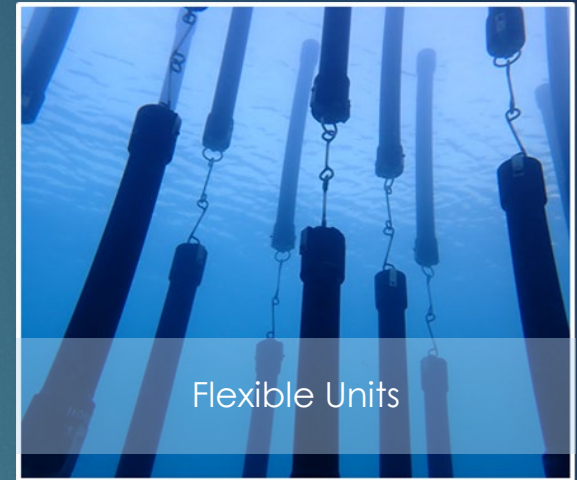
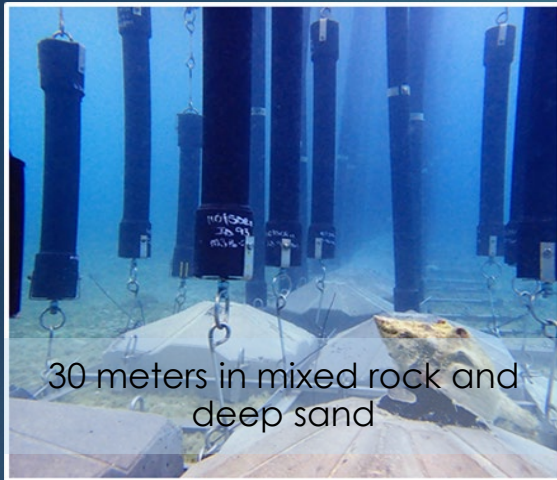




SharkSafe Barrier Installation in August 2023
Manatee swimming through our eco-friendly shark barrier

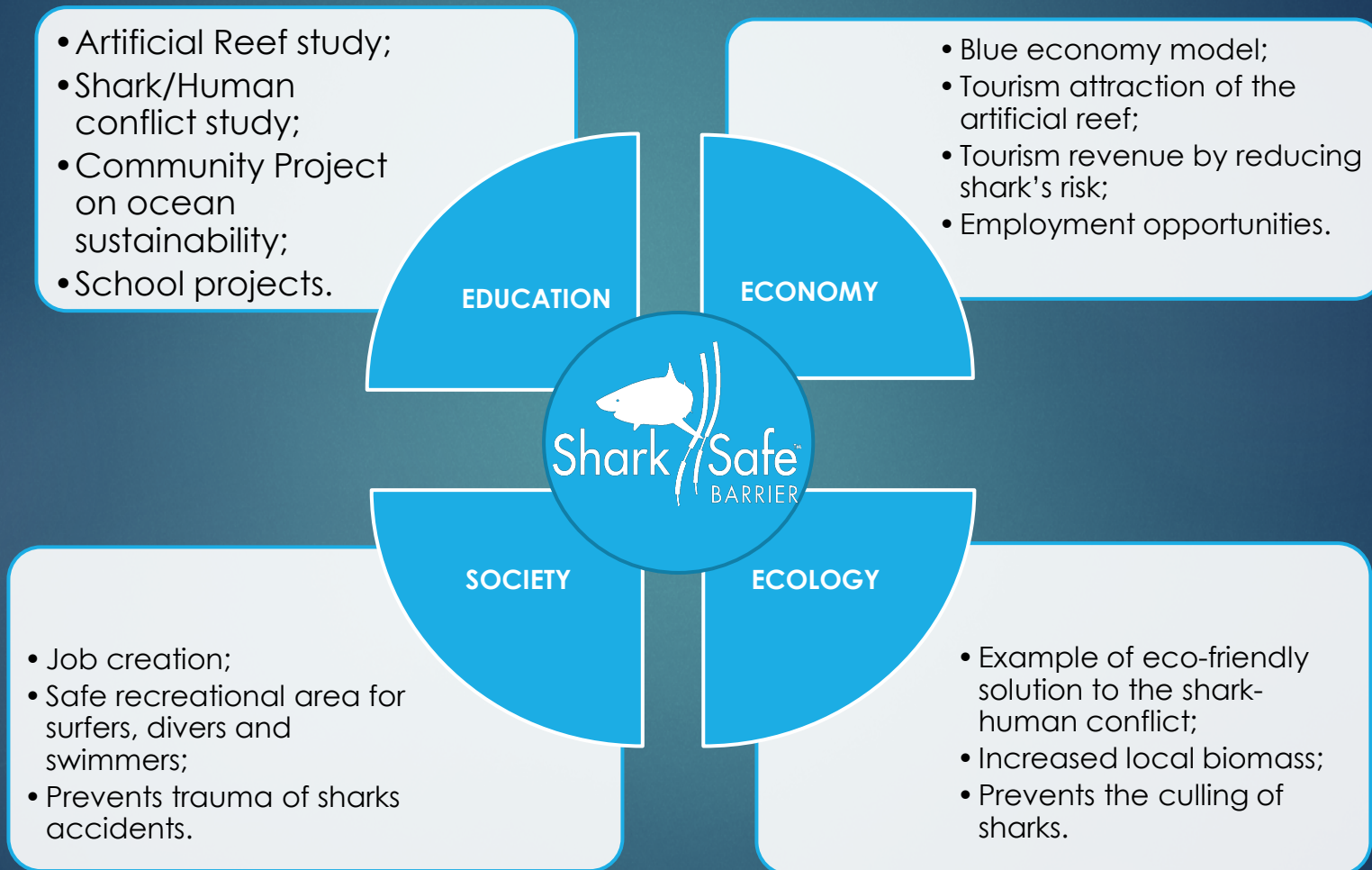


Commercial installation in the Bahamas - August 2023



- Manufacture completed in 30 working days;
- Installation completed in 6 days;
- Client's contact available on request.
- Minimal maintenance needed since installation.
- Successfully excluding sharks from the area.

Impact Value of the SharkSafe Barrier™



NATIONAL BENEFITS

JOB CREATION

Local installation and maintenance teams

SKILL DEVELOPMENT



LOCAL BENEFITS

BLUE ECONOMY

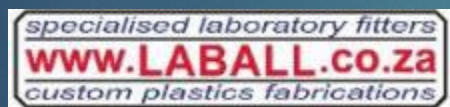
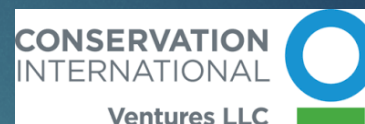
TOURISM RECOVERY

ECOLOGICAL BENEFIT

JOB CREATION



Strategic Partners



In the media



The Guardian



Business Insider



VentureBurn



The Citizen



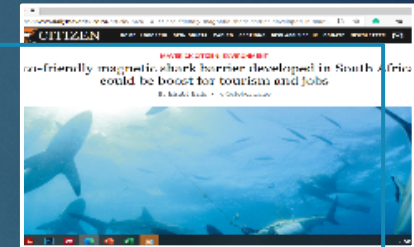
Australia Ch 9



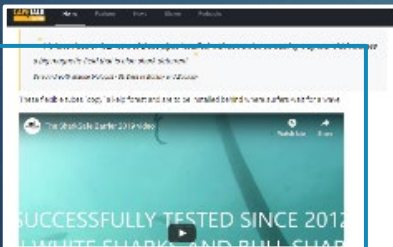
Business Insider



Sky News



Daily Maverik



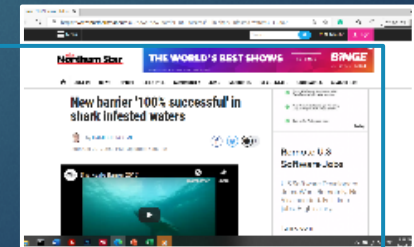
Cape Talk



BBC



Mail and Guardian



Northern Star

Awards



2021

**World Economic Forum
Top Ocean Innovator**



2020-2024

**Solar Impulse Foundation
Efficient Solution Label**



2020

**Finalist at the Ocean Impact
Pitchfest (Australia)**



2020

**National Science and
Technology Forum**



2019

**Italian-South African Chamber
of Trade and Industry Business
Excellency Award**



2017

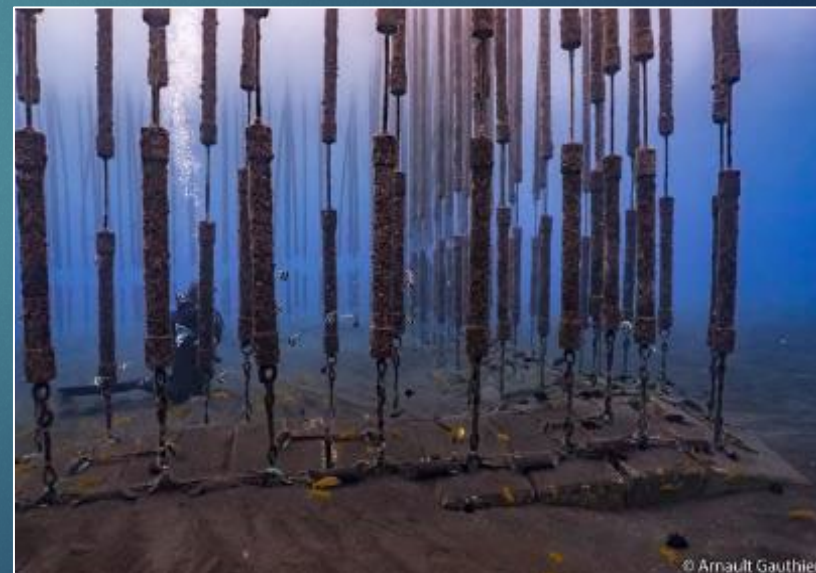
**Cleantech Open Business
accelerator Program**



THIS TECHNOLOGY MEETS
THE SOLAR IMPULSE STANDARDS ON
**SUSTAINABILITY &
PROFITABILITY**

ECO-FRIENDLY SHARK PROTECTION SYSTEM

- ONLY ECO-FRIENDLY & SHARK-SPECIFIC SOLUTION;
- SCIENTIFICALLY TESTED;
- CONTRIBUTES TO LOCAL BIODIVERSITY;
- PROMOTES ECO-TOURISM
- MINIMAL MAINTENANCE COST





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