South Africa's National Rocky Shore Monitoring Programme: Operation LIMPET

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& many partners

Oceans and Coasts

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20 YEARS OF FREEDOM

Where it all started: Two women and an oil spill

Wake-up call:
An oil spill at Goukamma MPA in 2013

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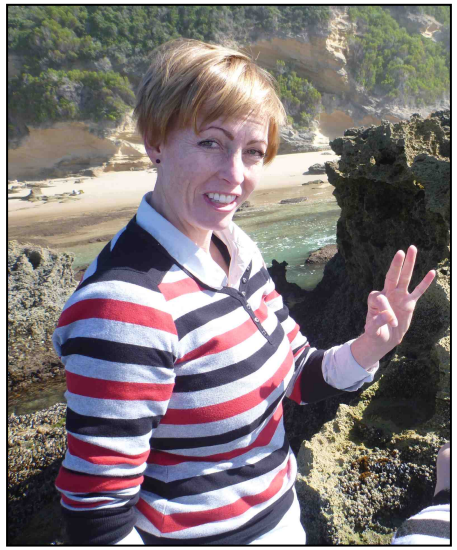

Natalie Baker (Cape Nature)

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Maya Pfaff (DEA)

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The birth of Operation LIMPET

What is Operation LIMPET?

L = Long-term

I = Intertidal

M = Monitoring through

P = Participation

E = Evaluation and

T = Training

Why monitor coastal biodiversity?

Baseline data are needed to assess environmental impacts

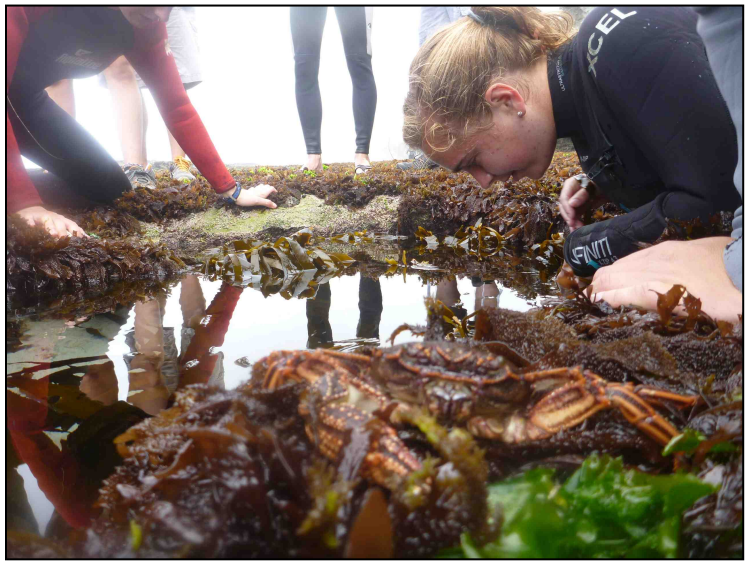
- Pollution events
- Invasions of alien species
- Sea level rise
- Change in water temperature
- Coastal erosion
- Sediment dynamics
- Etc…

Alien mussels smothering indigenous limpets at Elands Bay, 2016

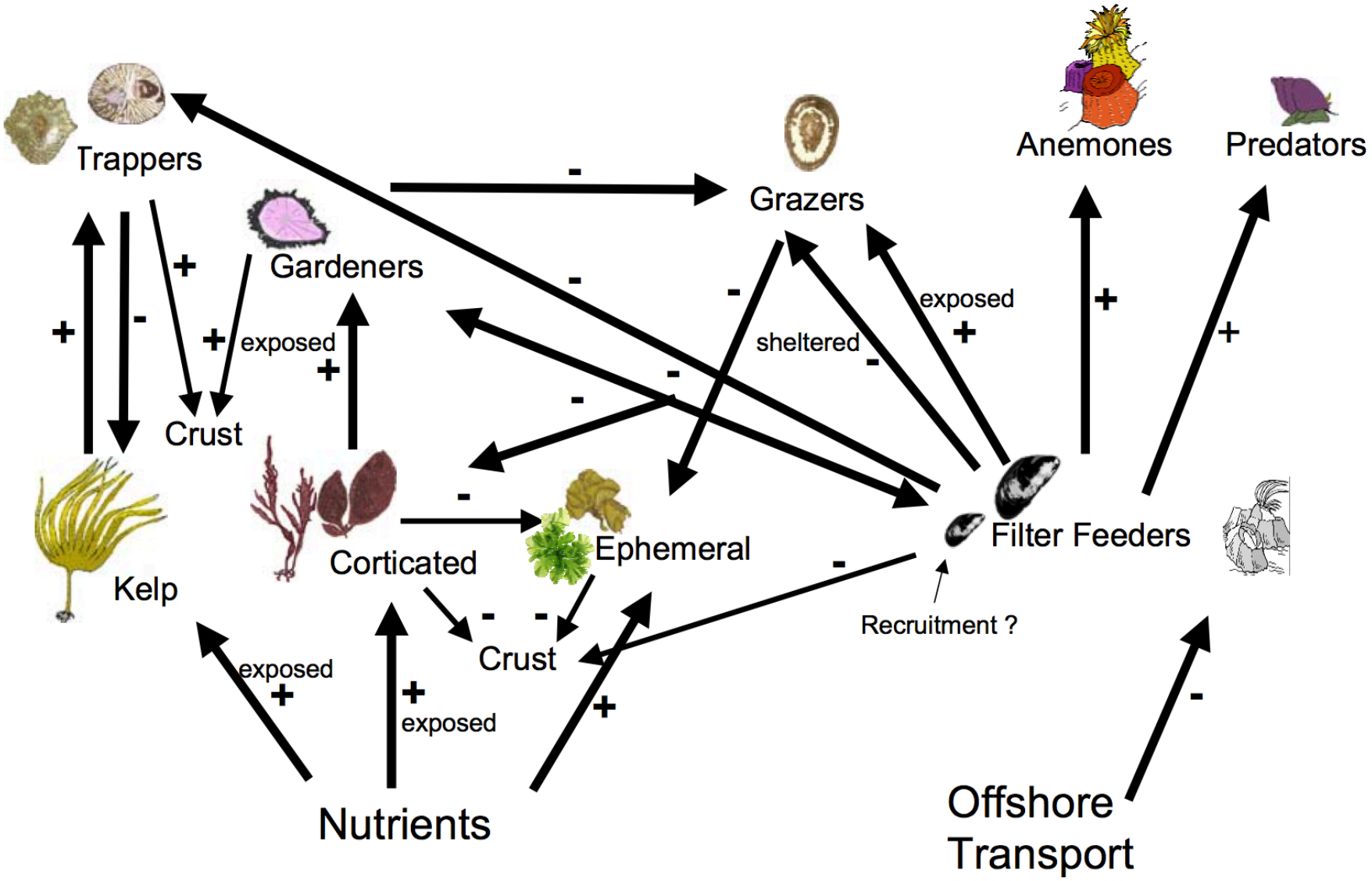
-> Various organisations have the mandate to monitor

Why rocky shores?

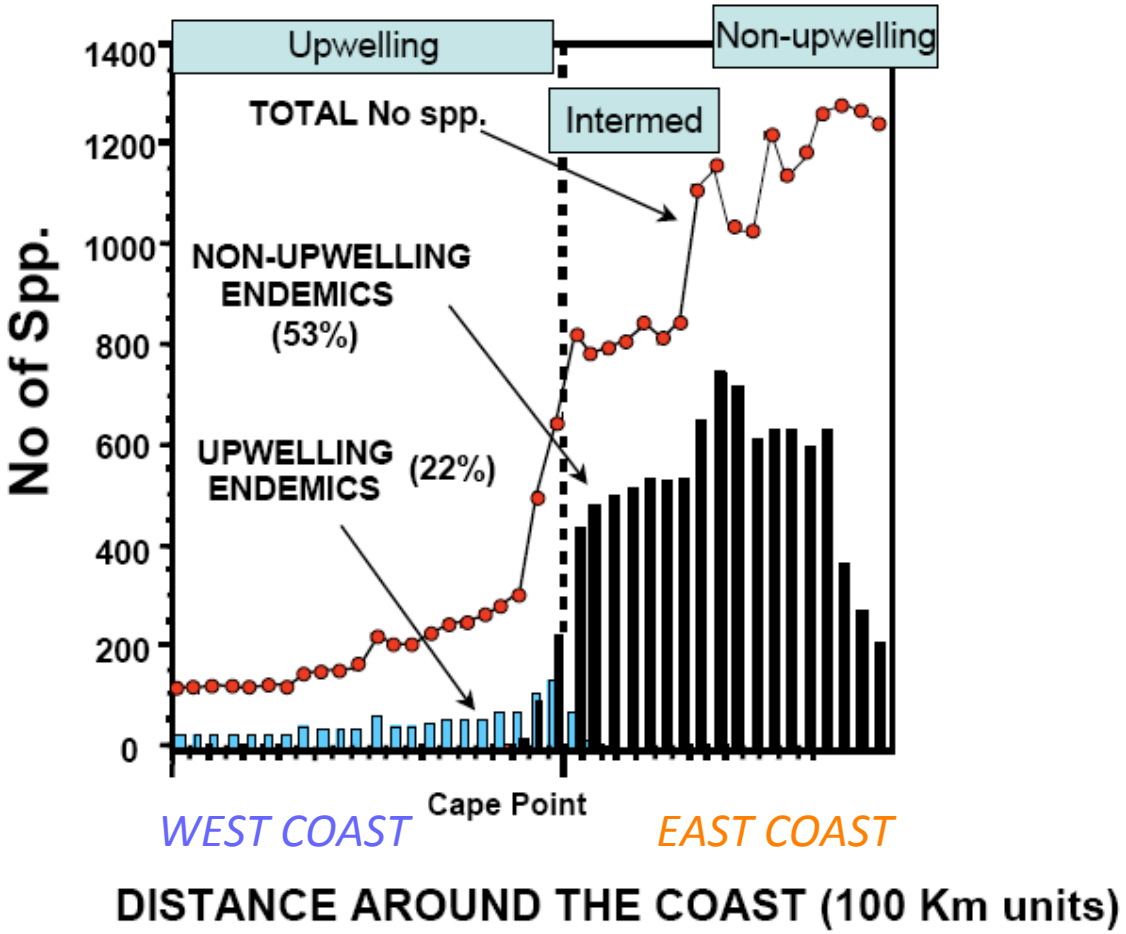
- Most accessible marine habitats
- Vulnerable to human-induced threats (harvesting, poaching, pollution…)
- Time and cost-effective data collection
- Ideal for educational purposes
- Representative for other marine habitats



Rocky shores are complex marine ecosystems



South African rocky shores: a biogeographic showcase



Courtesy: G. Branch

From last MPA Forum

Need for a consortium for rocky shore monitoring

- Many organisations have the mandate to 'monitor' environmental changes
- Lack of human capacity
- Lack of funding

-> Need to join forces to address our conservation goals

DO YOU WANT TO JOIN IN?

LIMPET: Participation is key

South African National Parks

EZEMVELO KZN WILDLIFE

ADVENTURE PROVINCE Eastern Cape PARKS & TOURISM AGENCY

Ikhaya lethemba SST Sustainable Seas Trust

UNIVERSITEIT STELLENBOSCH UNIVERSITY

CapeNature

SPES BONA

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

Organization for Tropical Studies

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Wildlands Studies

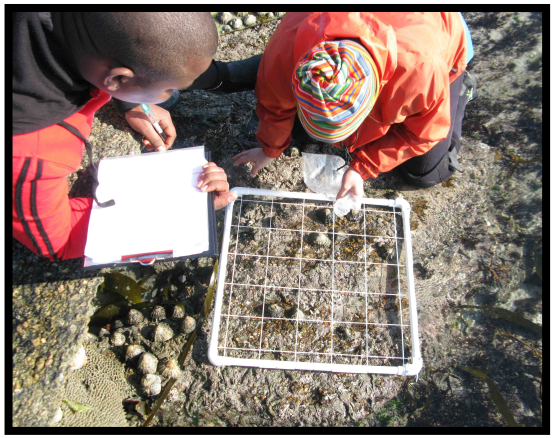
LIMPET: Active monitoring sites

Location	Biogeographic province	MPA (Y/N)	Partners	Start date	No. sites (inside+ outside MPA)	Frequency
Namaqua NP	Namaqua	(Y)	SANParks, DENC	Aug 2015	4 + 2	Annual
Elands Bay	Namaqua	N	OTS, UCT	Feb 2016	2	Monthly
Betty's Bay	Agulhas	Y	Cape Nature	Oct 2015	2	Annual
Goukamma	Agulhas	Y	Cape Nature	Aug 2014	2	6-monthly
Robberg	Agulhas	Y	Cape Nature	Aug 2014	2	6-monthly
Dwesa-Cwebe	Agulhas / Natal	Y	ECPTA	Nov 2015	2	Annual
KZN South	Natal	Y	Ezemvelo UKZN	2008 March 2016	2 + 1	Annual / Seasonal
KZN Central	Natal	N	Ezemvelo UKZN	2008 March 2016	3	Annual / Seasonal
KZN North	Delagoa	Y	Ezemvelo	2008	4	Annual

Total of 26 permanent sites, 18 inside MPAs

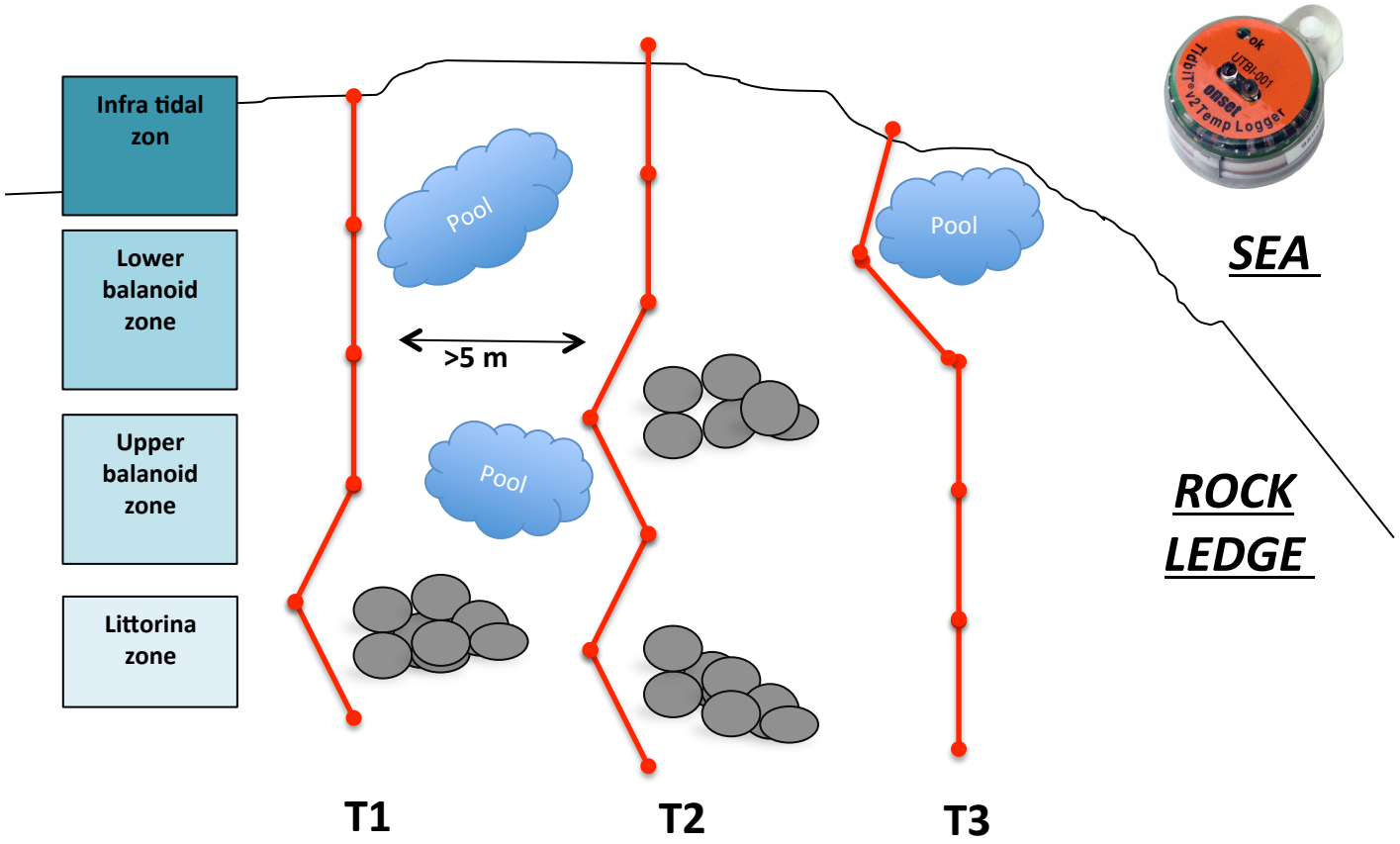
LIMPET: A 3-tiered approach

	Quick surveys (~1.5h)	Detailed surveys (~4h)	Focused /process studies
Who?	2 non-experts	8 experts	Scientists / students
Where?	As many sites as possible	Selected sites (e.g. historical data)	Selected sites (e.g. sentinel sites)
How frequently?	4-6x per year	Every 1-5 years	Focused periods
Method?	Photographic	In situ identification	Experiments etc
Data processing?	Preliminary: by non-experts Detailed: by experts	By experts	Scientists / students

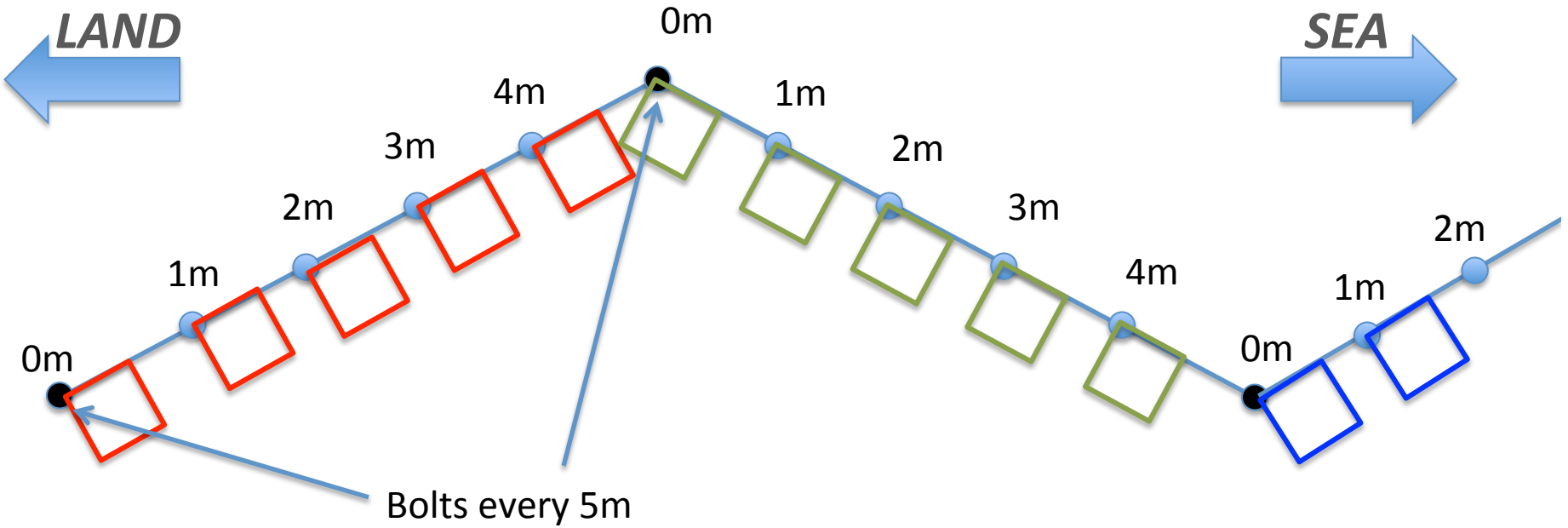


LIMPET monitoring methods: quick surveys

- 3 permanently marked transects
- Photo-quadrats (30x30 cm) taken every meter
- Supplementary belt transects to count the abundance of species of interest (e.g. Oysters,Giant Periwinkles, Abalone, mussels, harvested species etc.)
- Temperature loggers installed at 1 m depth at each site
- Fixed-point photography of each site to monitor sand movements

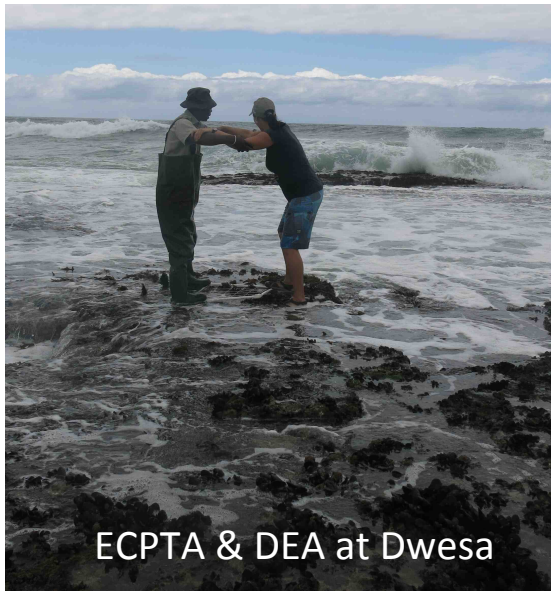


Consistent sampling protocol



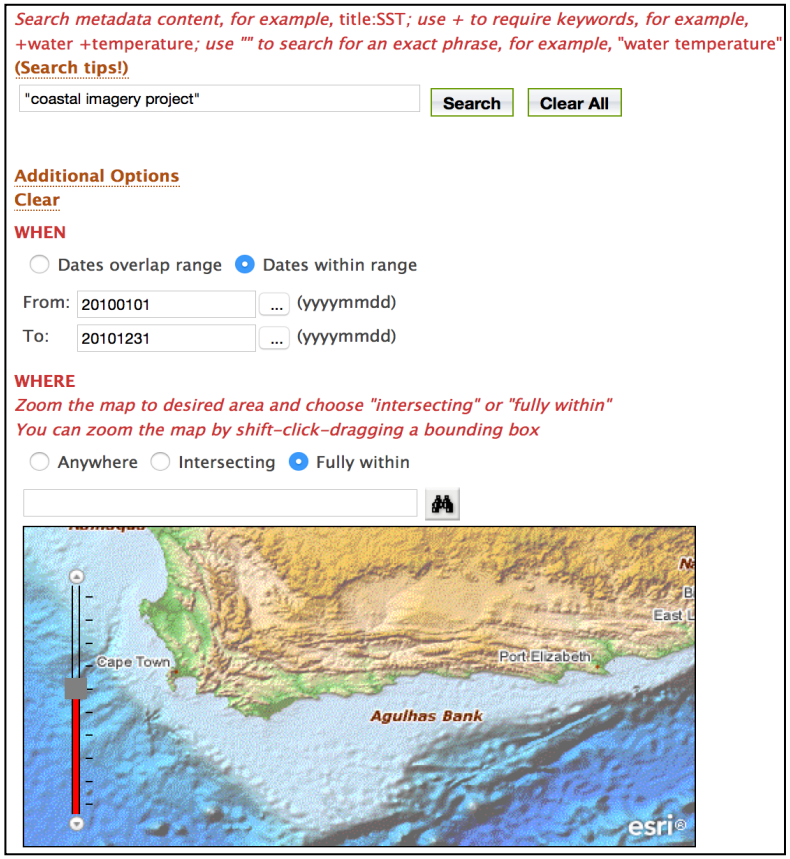
- **Lay a line between marker bolts – every 5m there is a bolt**
- **Look towards the sea**
- **Take a picture to the right of the transect line**
- **The meter marker should be in the bottom left corner of every picture**
- **At very bolt the direction of the pictures changes**

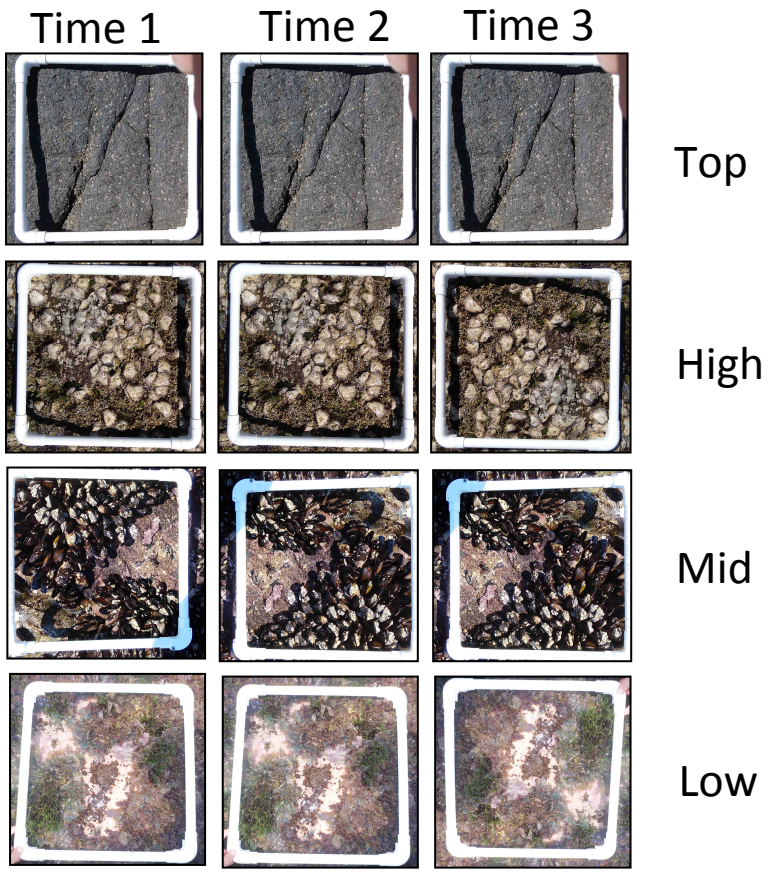
Operation LIMPET in action



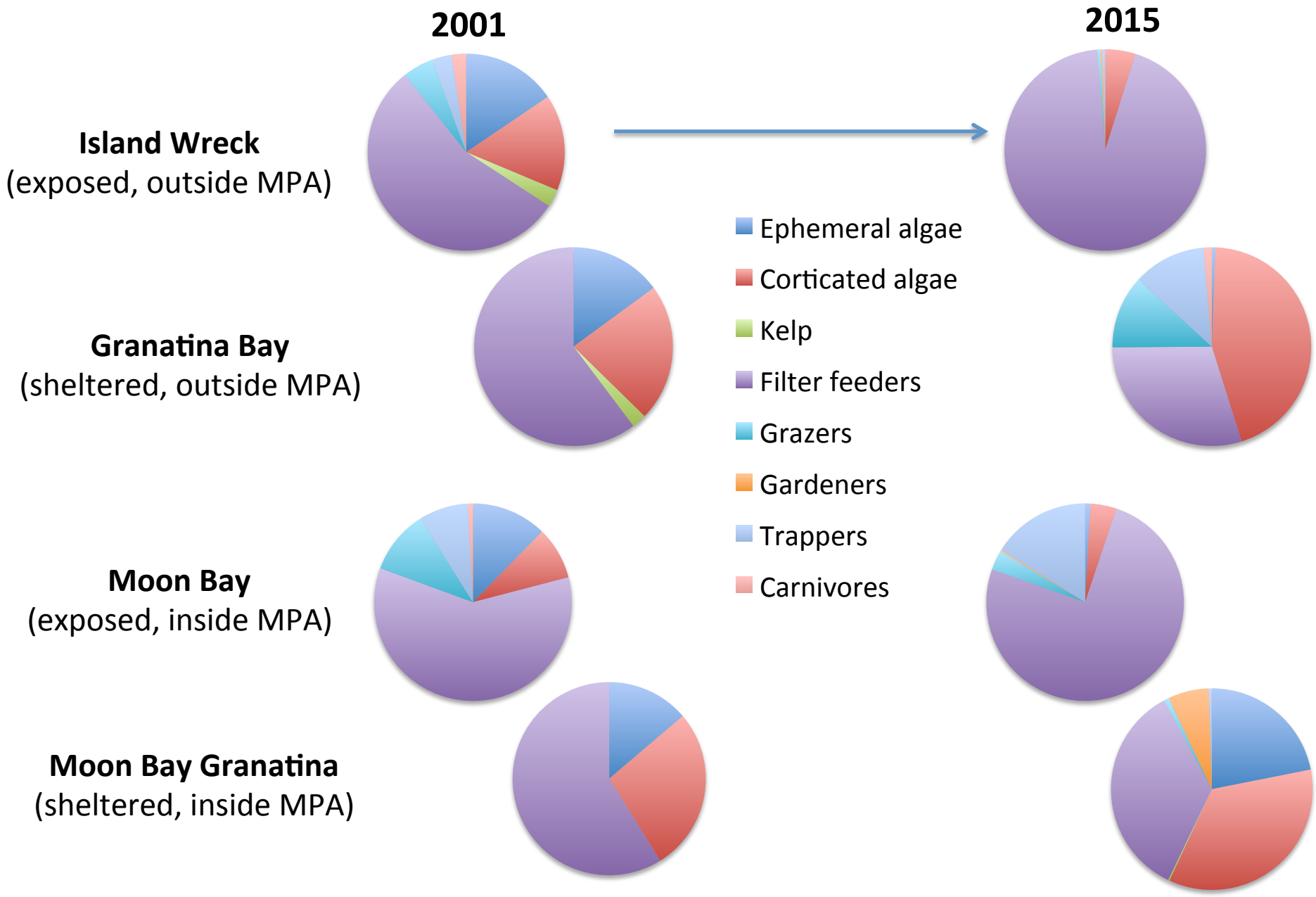
MIMS: Marine information management system

- Data base storage (photographs)
- Metadata catalog (date, location, transect, quadrat)
- Back upsystem
- Accessibility and data sharing: user-friendly interface





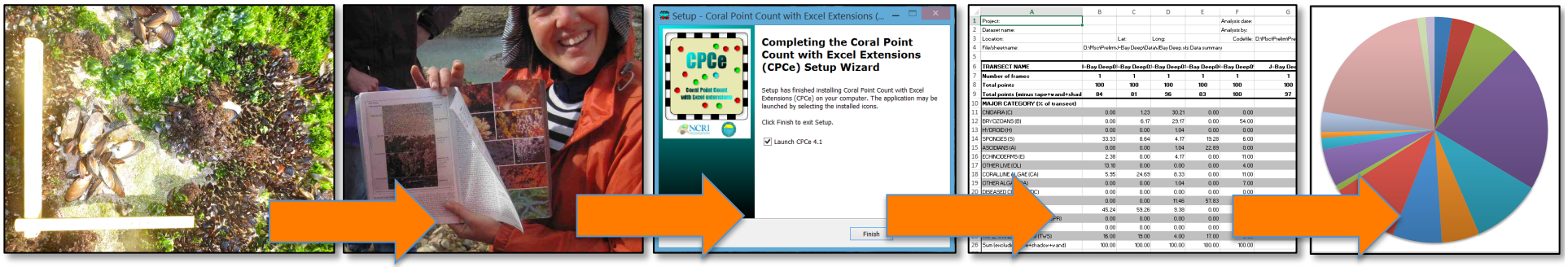
Long-term changes – Namaqua



Operation LIMPET: Training workshops

Topics

- Data organisation, storage & processing
- Species and/or functional group IDs
- Scoring data from photographs
- Submit data into national database
- Visualise results
- Consistent reporting systems



- To our partners for their enthusiasm and initiative
- To DEA staff and interns for their help with field work
- To the MPA managers for their support

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