

Marine Biodiversity Monitoring

SANBI SeaKeys Foundational Biodiversity Initiative program

Marine Monitoring Workshop held November 2015 (excl estuarine)
22 participants from 10 institutes

Reported on long-term marine monitoring projects

WHAT? WHERE? HOW LONG?

36 projects reported on in total



SeaKeys Monitoring Working Group

Questionnaire [ONE page]:

What does this monitoring project record?

[e.g. at a taxon level – Linefish / seabirds / mussels / reef biodiversity / physical variables etc.]

Where does this monitoring project take place?

If possible, please attach an **excel sheet of coordinates** in decimal degrees or a GIS shape file.

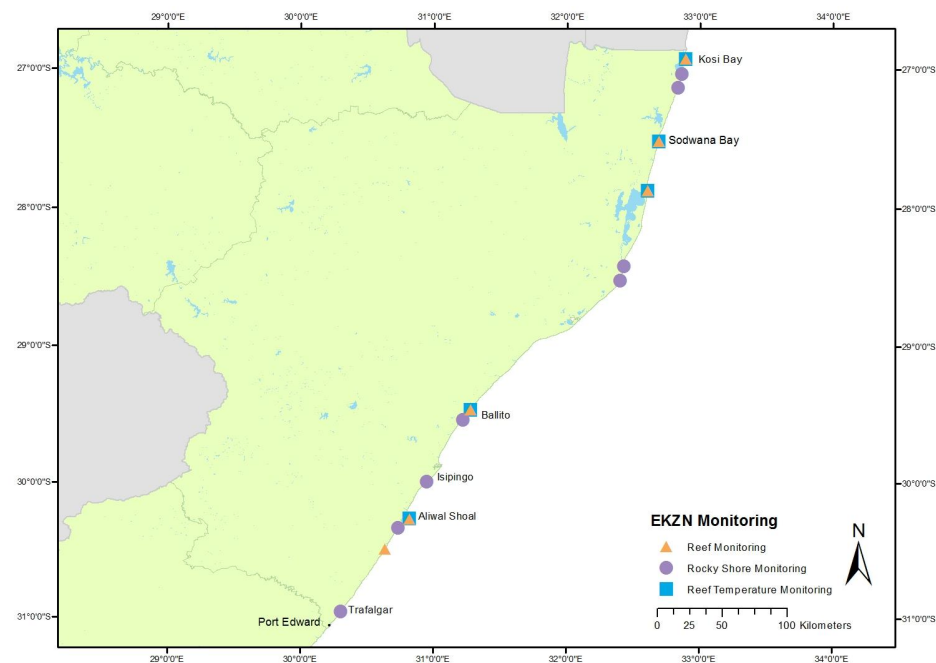
How often is this monitoring conducted?

[Continuous / hourly / weekly / monthly / quarterly / annually etc.]

- When did this monitoring initiative first start? / When intended to start? *[Month / Year]*
- Is the monitoring still ongoing?
- Is this monitoring project part of a larger programme? If so, what programme?
- Please provide a brief description of this monitoring initiative, or provide any other relevant comments:

SeaKeys Monitoring Working Group

1) SeaKeys Monitoring workshop report – SANBI website



2) BGIS project <http://bgis.sanbi.org> incl. shape files & metadata

Summary

WHAT?	WHO?	WHERE?
Phyto/Zooplankton	DEA	West Coast – 4 transect lines
	DAFF	Aquaculture sites Nationwide
	NMMU	Algoa Bay sandy beaches
Rocky shore	DEA	Nationwide
	SANParks	3 MPAs (Table Mtn, West Coast, Agulhas)
	KZN Wildlife	KZN coast
	Univ Stellenbosch	Cape Peninsula
Subtidal inverts	CSIR	Infauna at 3 KZN outfalls & 7 ports (National)
	KZN Wildlife	KZN coast
	NMMU	Algoa Bay islands
Deepsea inverts	DAFF/SAEON	Orange river to Port Alfred (50-1000 m)
Corals	SANBI	iSimangaliso 16 sites
	ORI	Sodwana Bay 1 site

Summary cont.

WHAT?		WHO?	WHERE?
FISH	Demersal	DAFF	Orange River to Port Alfred
FISH	Pelagic	DAFF	Orange River to Port Edward
FISH	Linefish	DAFF	KZN, E. Cape, other focal points
		SANParks	Table Mtn MPA, W.C. MPA, Agulhas MPA
		SAIAB (SAEON)	MPA x 6 Nationwide
		ORI	KZN coast, Pondoland MPA
		UCT	De Hoop MPA, Langebaan lagoon MPA
Turtles		KZN Wildlife	Sodwana to Mozambique border

Not reported on & Gaps identified

Not reported:

Sea Birds – BirdLife SA

Prawns & deepsea inverts – ORI & Univ Zululand

Fish larvae and eggs – SAIAB, NMMU

Whales – Univ Pretoria, DEA

Sharks – DEA, Bayworld

Other Resources – DAFF – kelp & inshore

Spatial gaps:

West coast – north of Saldanha Bay

Transkei coast – in terms of offshore subtidal

Shallow subtidal (intertidal to 5 m depth)
i.e. surfzone

Whole offshore region

Whole systems – links between systems e.g. dams, rivers, estuaries, near shore, offshore.

Sandy beaches

Ocean acidification

Phytoplankton taxonomy and national lists

Phenology – the timing of natural events

Male turtle monitoring - tracking

Council for Scientific and Industrial Research (CSIR)

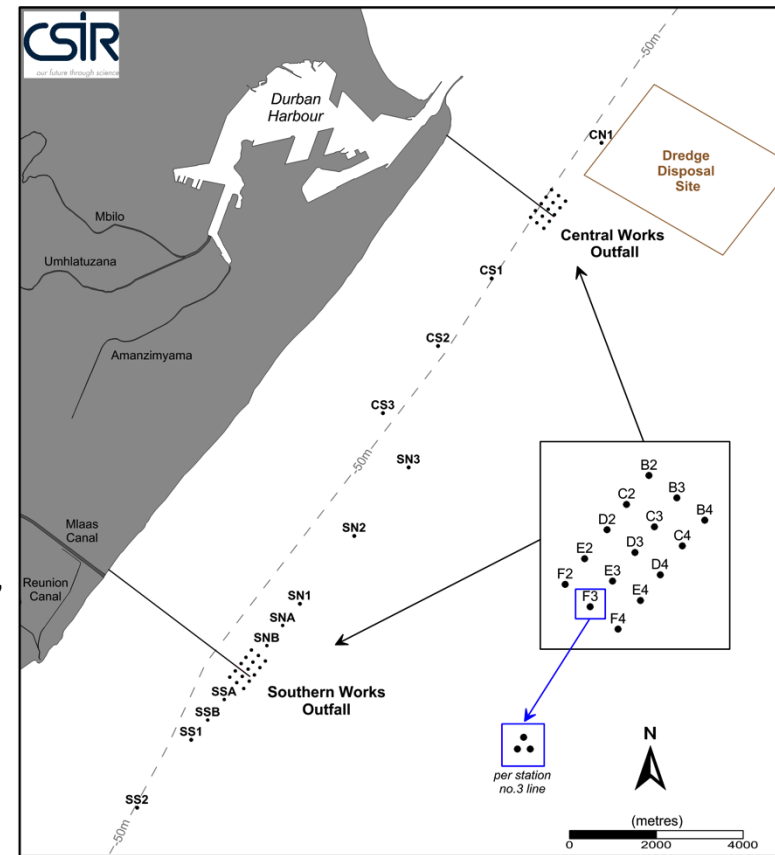
KZN Waste Water Outfall Monitoring

Benthic infauna, some meiofauna

Water quality, chemistry, toxicity & Sediment properties including nutrients, bacteria, hydrocarbons and/or heavy metals

1. Durban outfall – late 1970s – current; 63 sites, annually
2. Richards Bay outfall – early 1980s – current; 39 sites, annually
3. Sappi SAICOR (Umkomaas) outfall – early 1980s – current; 7 sites, annually

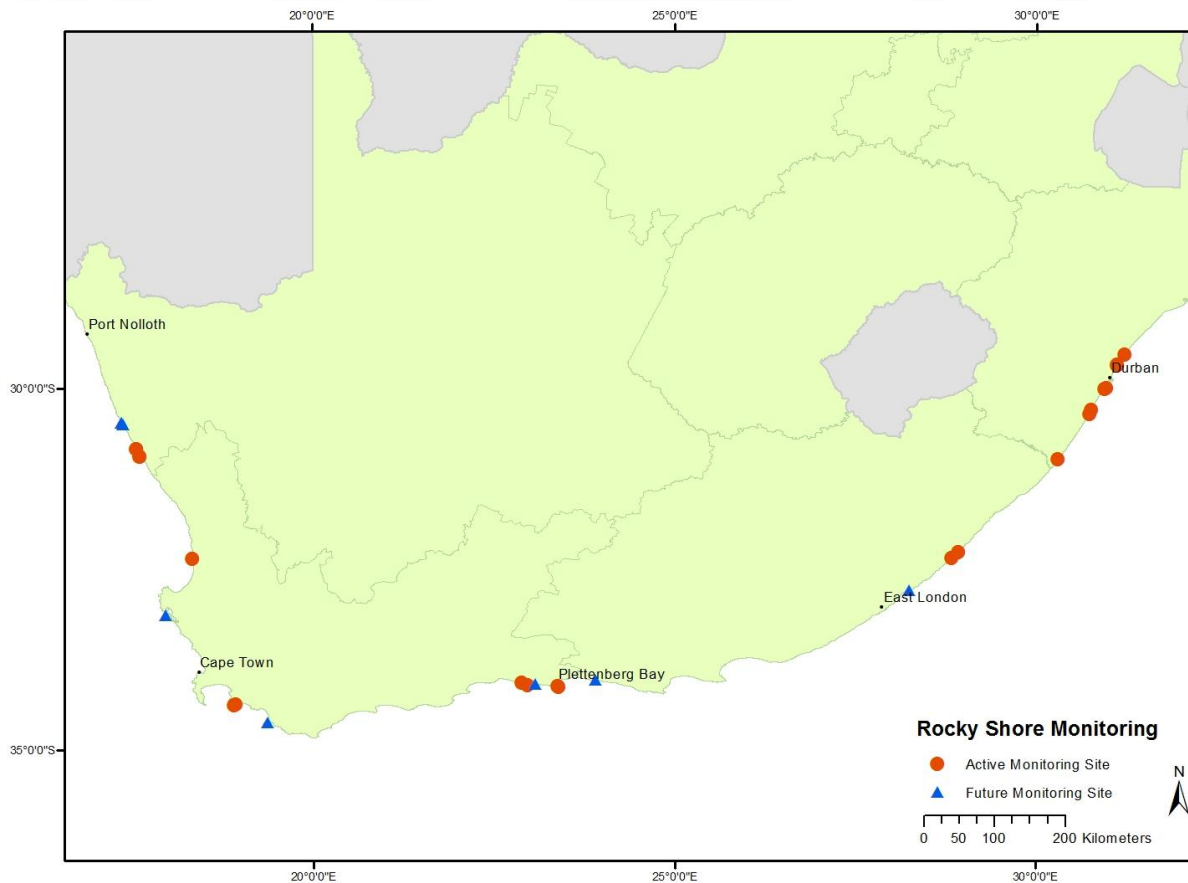
Compliance and management purposes



Durban monitoring example

Department of Environmental Affairs (DEA) + Collaborators

Rocky shore monitoring (Operation LIMPET)



*Intertidal rocky shore species +
Associated physical variables*

Six sites active (blue)
± 13 sites planned (orange)

Started in 2015 – ongoing
Monitored either quarterly or
1-3 years

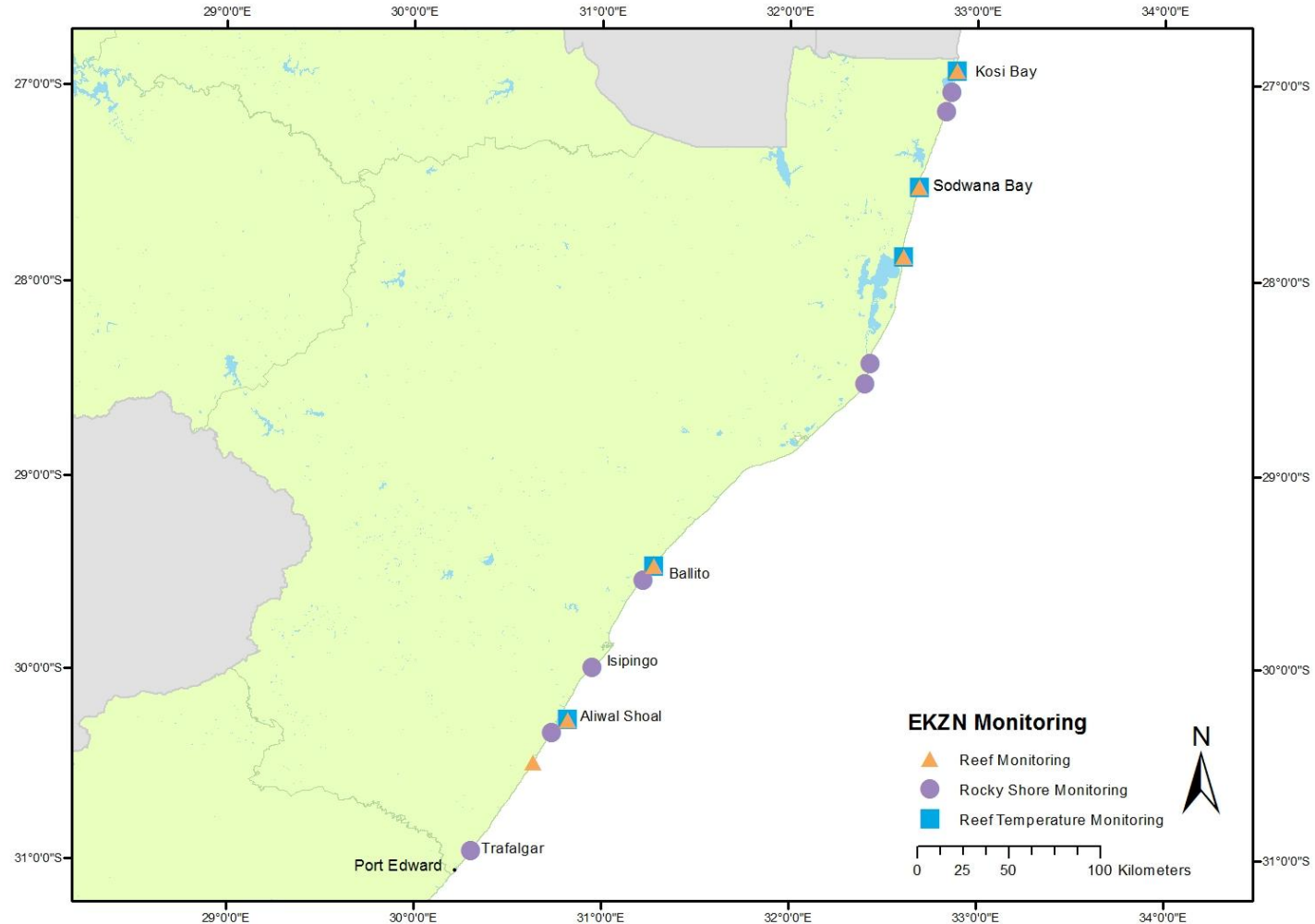
Fixed transects with photo
quadrats/meter
% cover all inverts and algae with
counts of mobile spp.
+ temperature logger

Ezemvelo KwaZulu-Natal Wildlife (EKZN Wildlife)

1. Rocky Shore biodiversity: Kosi Bay to Port Edward; 8 stations, 15 transects each; annually; for climate change responses
2. Subtidal reef benthic biodiversity: KZN coast; 6 stations with replicate transects; annually; for climate change responses
3. Turtle monitoring: Only 2 species since 1983 from Sodwana Bay to Mozambique border; for compliance and population purposes



Ezemvelo KwaZulu-Natal Wildlife (EKZN Wildlife)



science
& technology

Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA



SAEON
South African Environmental
Observation Network

South African National Biodiversity Institute (SANBI)

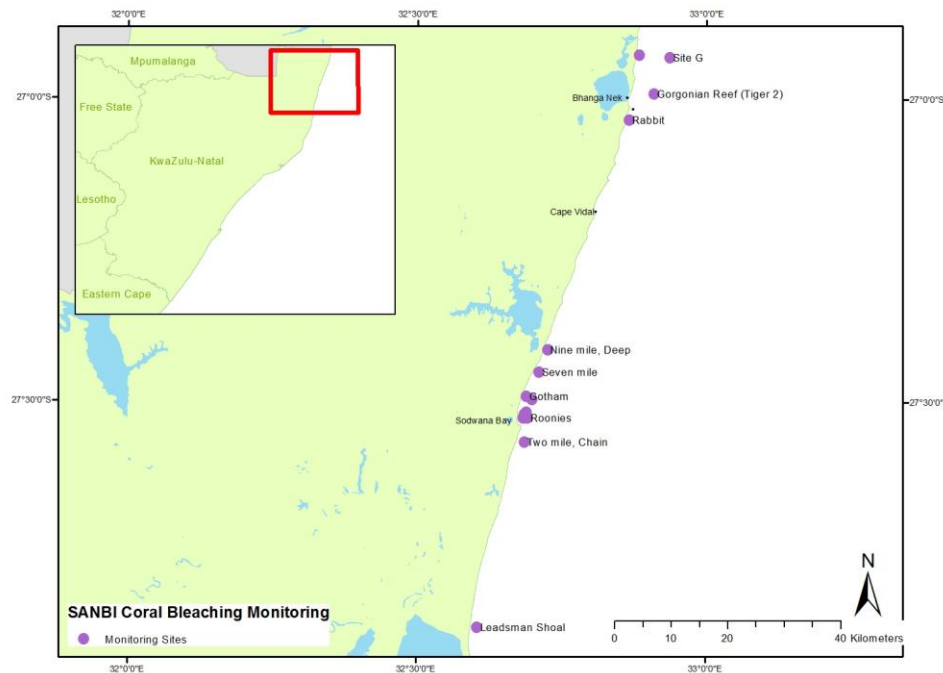
with SAEON involvement

iSimangaliso Coral Bleaching Monitoring

Coral species

Associated bleaching index, temperature

16 sites where at least 250 individual colonies are monitored annually (April/May)



2005 – current = Annually

Climate change impacts purpose

South African National Parks (SANParks)

Marine Protected Areas Monitoring (patrols 5 days per week)

Line fish and shore invertebrate species

Associated efforts, lengths and frequencies

Table Mountain National Park MPA



Since 2005 to current

West Coast National Park MPA



Since 2009 to current

Agulhas National Park MPA



Since 2011 to current

Compliance and management purposes

Thank you

Report, shape files and metadata: <http://bgis.sanbi.org>
(Login required)

Report only: www.sanbi.org / Marine Programme Products

Oceanographic Research Institute (ORI)

What	Where	Time span	Purpose
<u>Fish</u> tagging	Entire coastline	1984 - current	Research / Management
Surf zone <u>fish</u> Monitoring	iSimangaliso	2001 - current	Research / Management
Reef <u>fish</u> Monitoring	Pondoland MPA	2006 - current	Research / Management
KZN Boat launch site Monitoring	All KZN boat launch sites (recording species of <u>fish</u> caught)	2004 - current	Compliance / management
<u>Coral</u> Reef Monitoring	Nine mile reef at Sodwana Bay	1993 – current	Response to climate change



Department of Agriculture, Forestry & Fisheries (DAFF)

with SAEON involvement (benthic)

Demersal trawl surveys

Demersal fish biodiversity (+ 257 species)

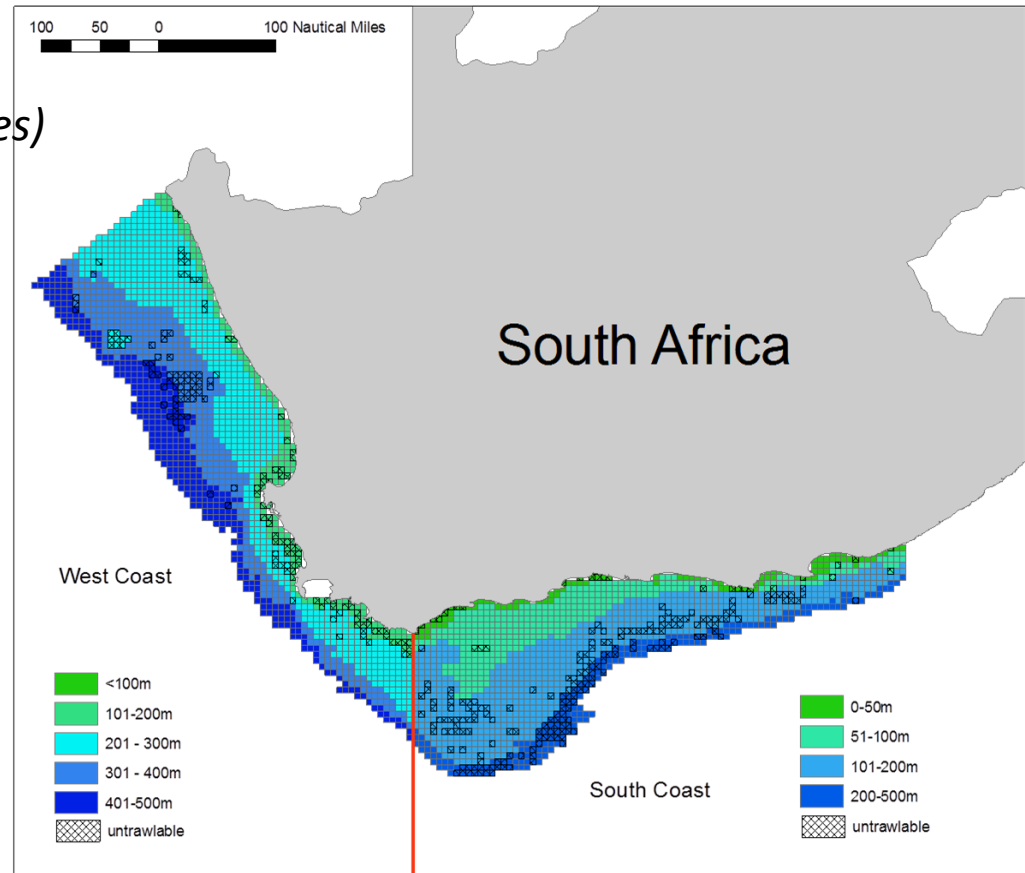
Benthic epifauna (+ 350 species)

Associated physical variables

240 stations depth stratified
from 50 m to 1000 m

1984 – current = Annual

Stock management purpose



Department of Agriculture, Forestry & Fisheries (DAFF)

Pelagic fish surveys

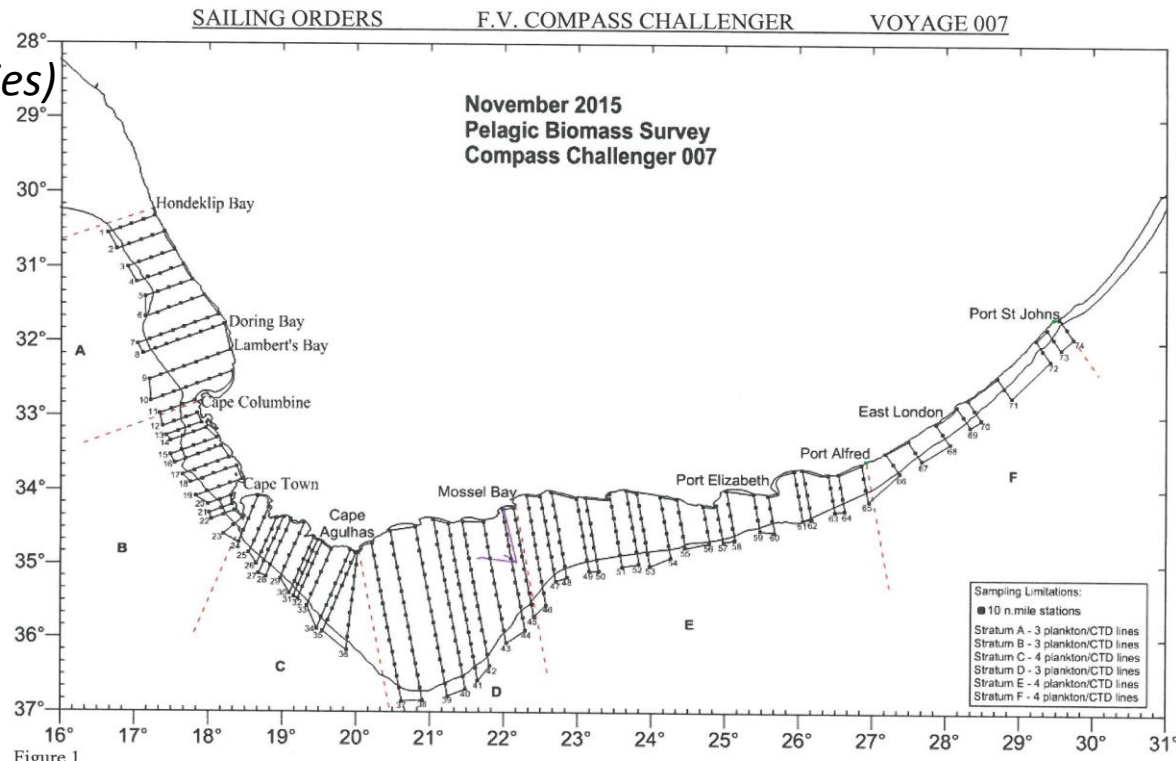
Pelagic fish biodiversity (7 species)

Associated physical variables

Two surveys per year
 ± 100 stations per survey

1984 – current = Bi-Annual

Stock management purpose



Department of Agriculture, Forestry & Fisheries (DAFF)

Small scale subsistence and linefish monitoring

Fish species

Associated efforts, lengths and frequencies

1. National Marine Linefish Monitoring: 1985 to current – Mostly KZN commercial
2. Netfish monitoring (beach seine and gillnet): 1985 to current
3. Small-scale fisheries monitoring: 2011 to current – Mostly Eastern Cape



Stock management purpose

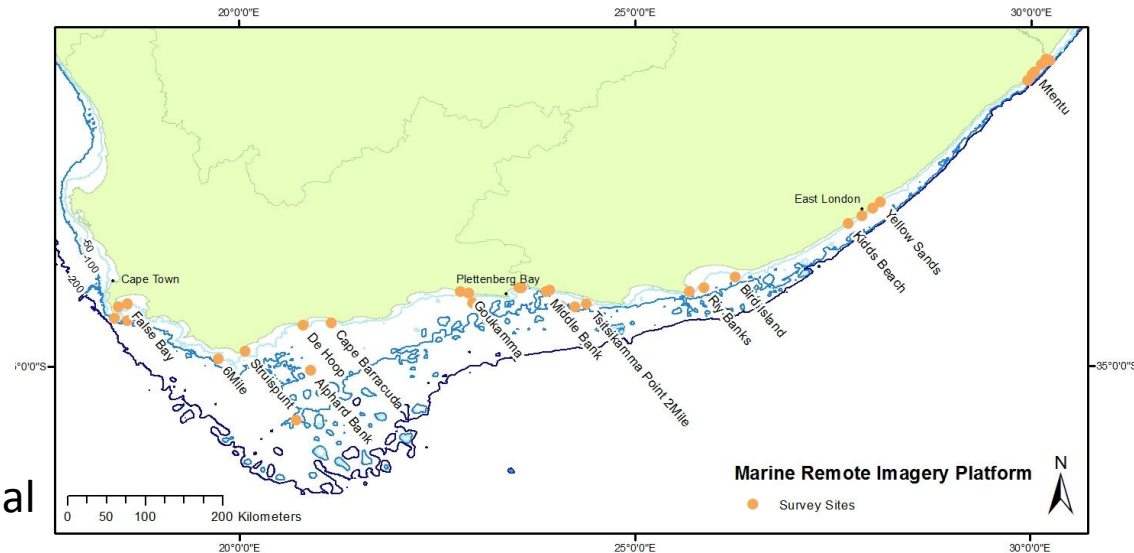
Marine Protected Area Monitoring

Reef fish species

Macro-benthic species

Habitat surveys

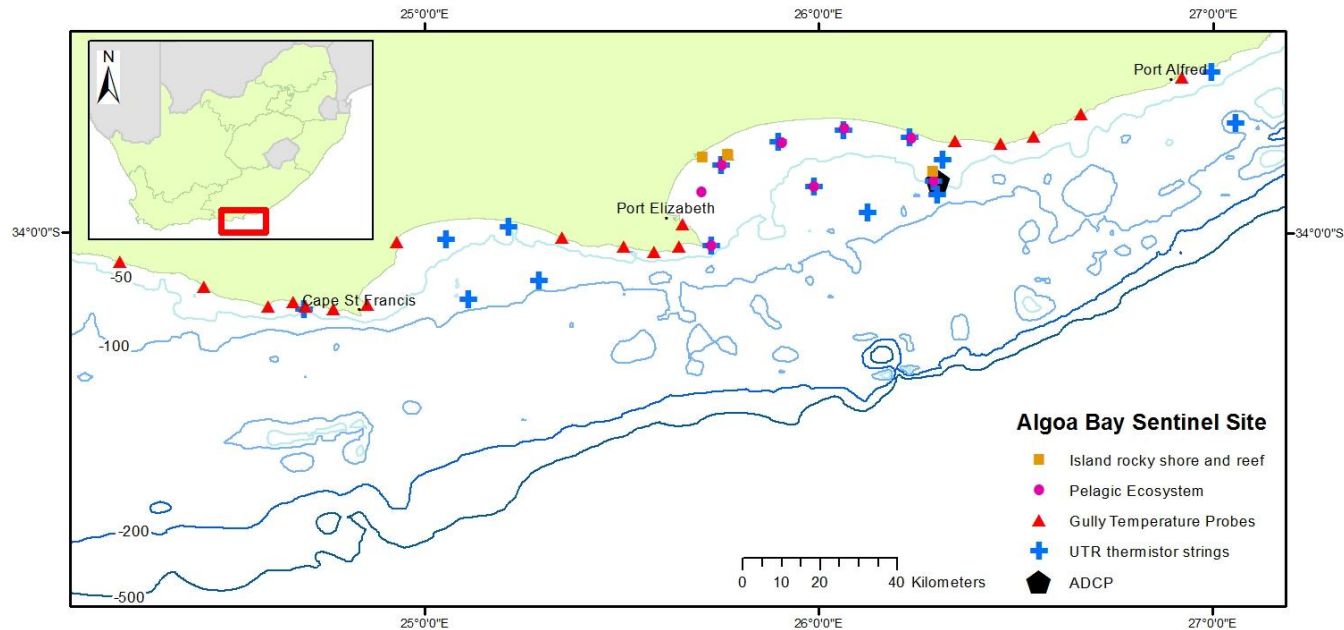
- Tsitsikamma – 2013 to current, biannually
- Algoa Bay/Bird Island – 2014 to current, annual
- Pondoland – 2014 to current, annual
- De Hoop, Goukamma, Amathole – 2015 started, planned to survey every 4 years.
- Remaining sites: ad hoc surveys



Climate change impacts, management & research purpose

South African Environmental Observation Network (SAEON) & collaborators

Algoa Bay Sentinel Site



- Physical variables (temperature & current) – Continuous Monitoring Platform
- Pelagic nutrients, phytoplankton & zooplankton
- Island rocky shore and subtidal reefs – invertebrate community composition
- Sandy beaches and groundwater – physical, water chemistry and phytoplankton