Workshop on Identifying and Co-ordinating Research as an Adaptation to Climate Change in the South African Marine Fisheries and Marine Aquaculture Sectors
14 – 16 March 2017

Photo credits: http://www.nereusprogram.org/wp-content/uploads/2016/04/3425228610_28545b88c8_b.jpg

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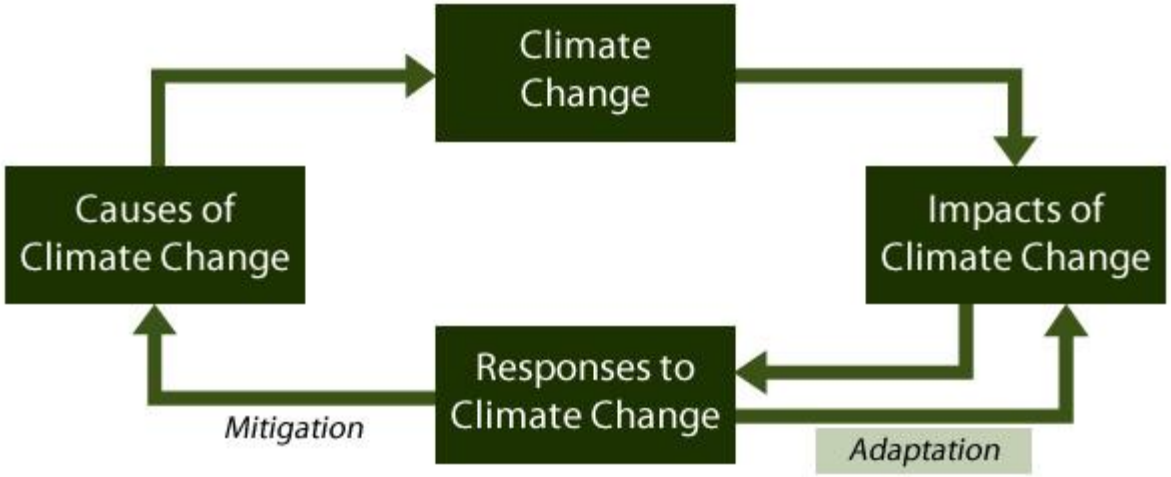
Overview of the DAFF Climate Change Adaptation and Mitigation Plan (CCAMP), Aims and Scope of the Workshop
Session 1



How People Interact with the Climate System. Credit: Brent Yarnal. https://www.e-education.psu.edu/geog438w/node/496

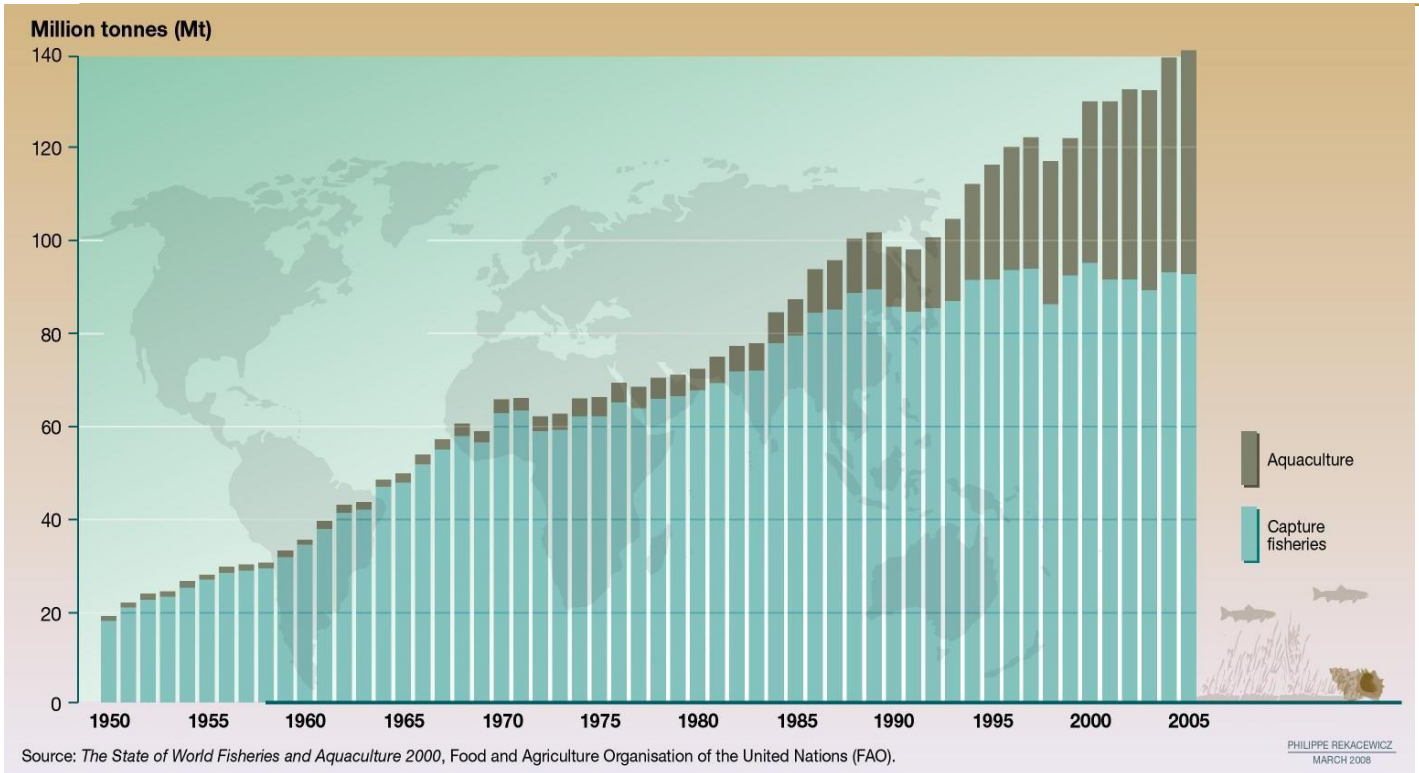
•This presentation, opens with a preamble on climate change, leading into an introduction to the Climate Change Adaptation and Mitigation Plan (CCAMP) for DAFF. This will briefly look at the process of developing the plan, landing us here at this workshop - the what, how and why.

Climate Change

•The Three Biggest Threats to Global Fisheries have been identified as i) Overfishing, ii) Pollution, and iii) Climate Change

•Climate Change (CC) identified as one of the greatest challenges facing our country this century & an impediment to achieving SA's Millennium Development Goals (MDGs)

Climate Change....global catches



•FAO records show an increase in landed capture fisheries between 1950-1985.

•Catches variable thereafter, **but...**aquaculture production shows a steady increase. **Interesting changes...**

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Climate Change....significance

•Increasing evidence that climate change will have devastating effects on future world economies if no action taken to reduce likely impacts

•Capture fisheries 93.4mT

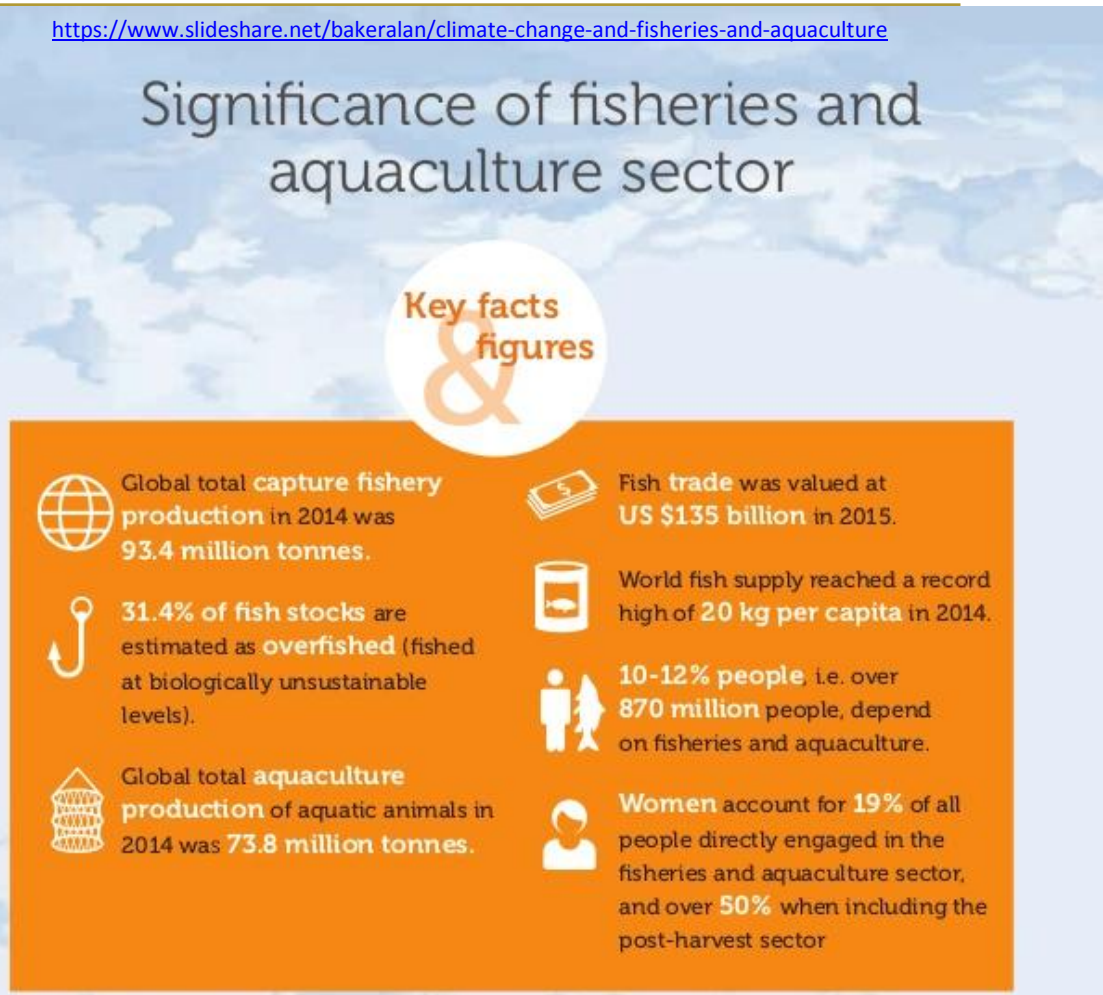
•31.4% fish stocks overfished

•Aquaculture 73.8mT

•Fish Trade US$ 135b

•Supply 20kg per capita

https://www.slideshare.net/bakeralan/climate-change-and-fisheries-and-aquaculture



•870m dependent on fisheries & aquaculture

•19% engaged in sectors are women; 50% post harvest

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Climate Change....some effects

- Africa one of most vulnerable continents to climate change and climate variability due to low adaptive capacity aggravated by interaction of multiple stressors

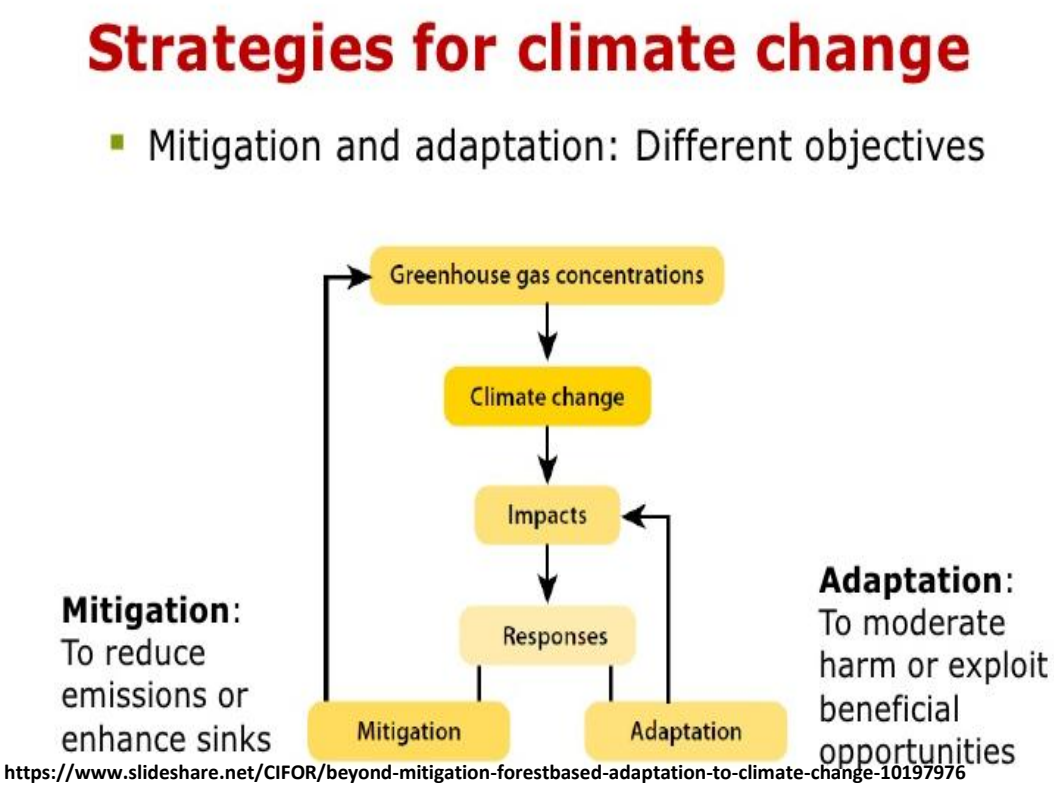
- **Availability**-will vary through changes in habitat; stock &spp. distribution.

- **Stability**-impacted by changes in seasonality, increased variance in ecosystem prod. & increased supply variability & risks

- **Access**-affected by livelihood changes

- **Utilization**-products impacted and some communities to adjust to non-traditional spp.

DAFF Sector Plan: Climate Change Adaptation and Mitigation Plan (CCAMP)



https://www.slideshare.net/CIFOR/beyond-mitigation-forestbased-adaptation-to-climate-change-10197976

Objectives:

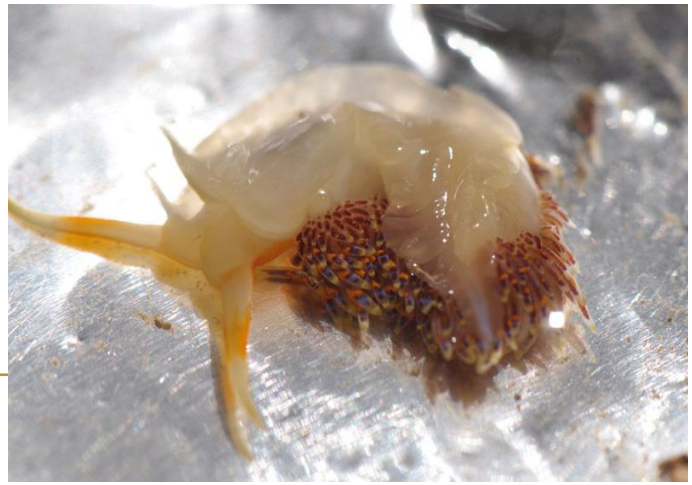
1. To implement an effective climate change program in compliance with the National Climate Change Response White Paper (NCCRWP 2012), and
2. To support disaster risk management.

Project Background: DAFF

DAFF mandated to take into account national responsibilities & developmental priorities under Article 4(a), (e) & (i) of the UNFCCC...

United Nations
Framework Convention on
Climate Change

- Institutional Arrangements for Climate Change
- Vulnerability Assessment to Climate Change
- **Adaptation and Mitigation Plan**
- Response and Recovery



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CCAMP Project development: Fisheries

2010 –Start of development of Climate Change Adaptation & Mitigation Plan

Workshops in Pretoria & drafting of CCAMPs for Agriculture

Fisheries Sector deferred due to lack of capacity

- COP17 hosted by South Africa requiring participation and input from new branches appended to Agriculture, i.e. Forestry & Fisheries

- Formation of the Fisheries Climate Change Task Team (FCCCT)

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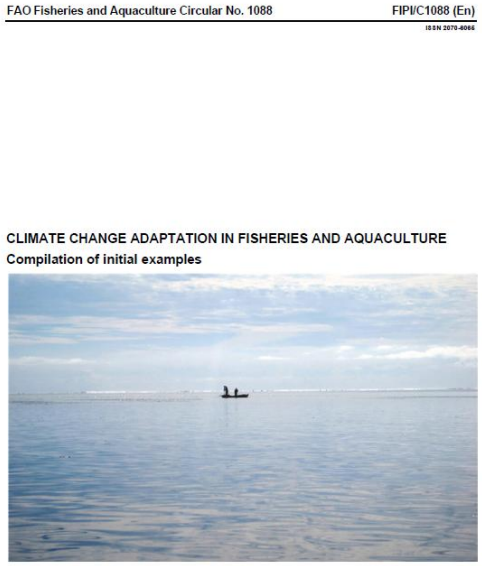
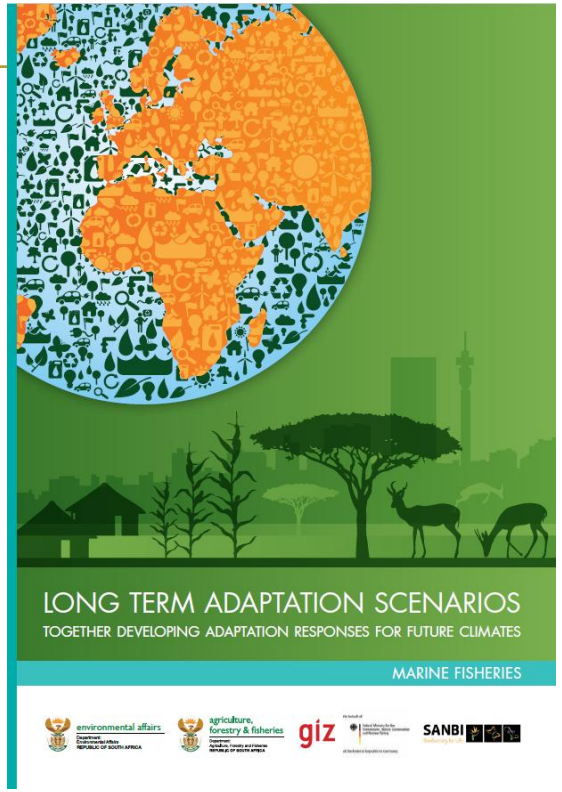
CCAMP Project development: Fisheries

- Long-term Adaptation Scenarios (LTAS) by DEA & other institutions

- Concurrently, but unrelated, the Benguela Current Commission (BCC) organised National Vulnerability to Climate Change Workshop for South Africa held in November 2013.

(Note this addressed fisheries in BCLME)





CCAMP Project development: Fisheries

- 2014- Funding availed to develop plans for Forestry & Fisheries
- FRS (Fisheries Research Surveys) service provider & Task Team planning
- Impacts to Climate Change Book Chapter (in press)
- Process unrelated to development of CCAMP, but turned out to be very relevant

The impacts of Climate Change on Marine Fisheries and Aquaculture and their Adaptations

Edited By Bruce F Phillips[1] and Monica Pérez-Ramírez [2]

[1]Curtin University, Department of Environment and Agriculture, Western Australia

[2], Consejo Nacional de Ciencia y Tecnología - Centro de Investigación Científica de Yucatán, *Mexico*

Chapter 15
South Africa

Johann Augustyn[1], Andrew Cockcroft[2], Sven Kerwath[2], Stephen Lamberth[2], Jean Githaiga-Mwicigi[2], Grant Pitcher[2], Michael Roberts[3], Carl van der Lingen[2], Lutz Auerswald[2]

[1]Rhodes University, South Africa.

[2]Department of Agriculture, Forestry and Fisheries, South Africa.

[3]Ocean Sciences and Marine Food Security, Nelson Mandela Metropolitan University, Port Elizabeth, South Africa and National Oceanography Centre, European Way, Southampton, United Kingdom.

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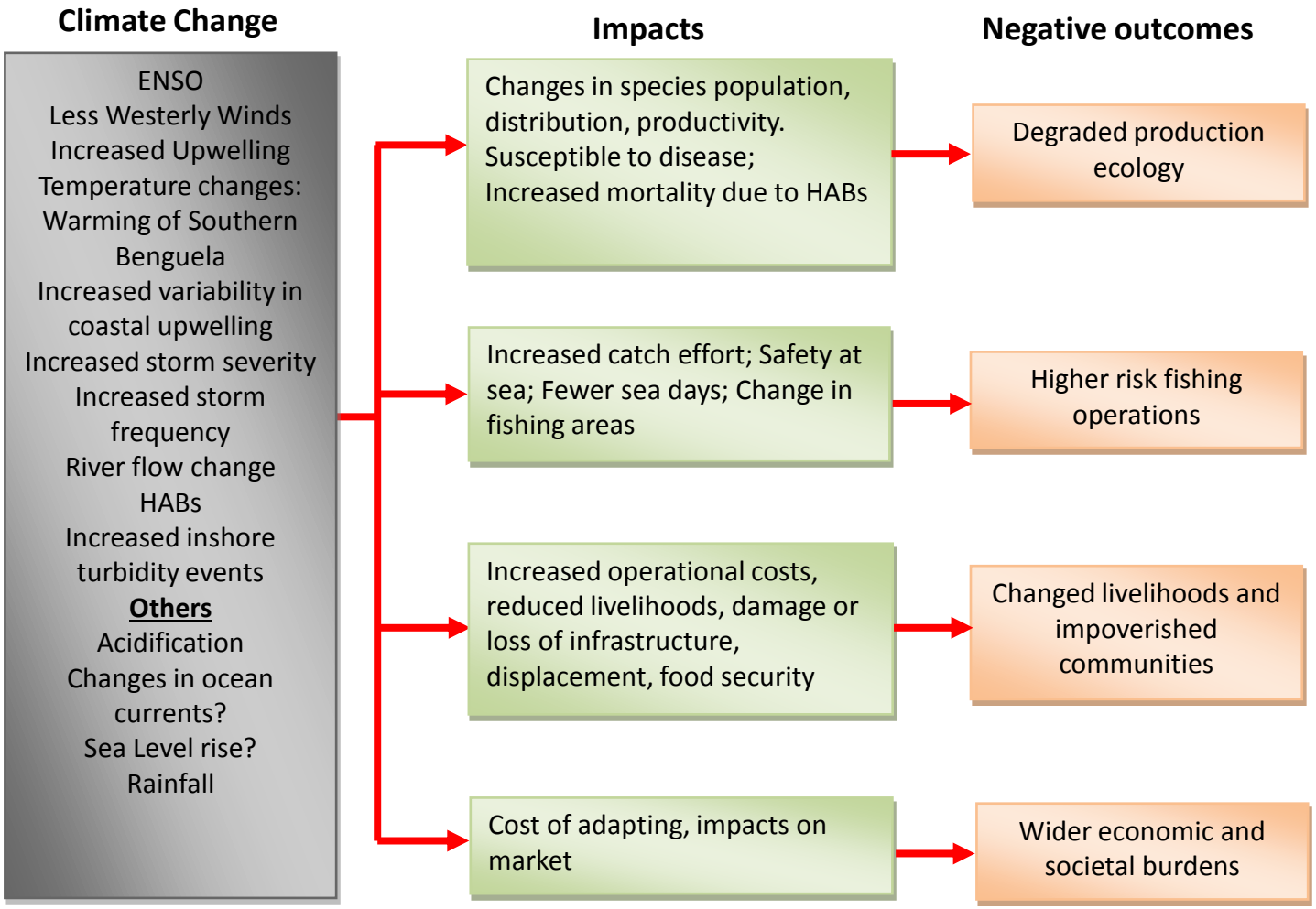
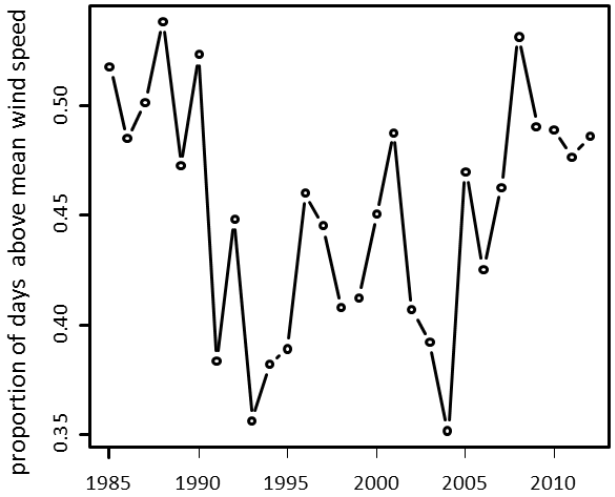
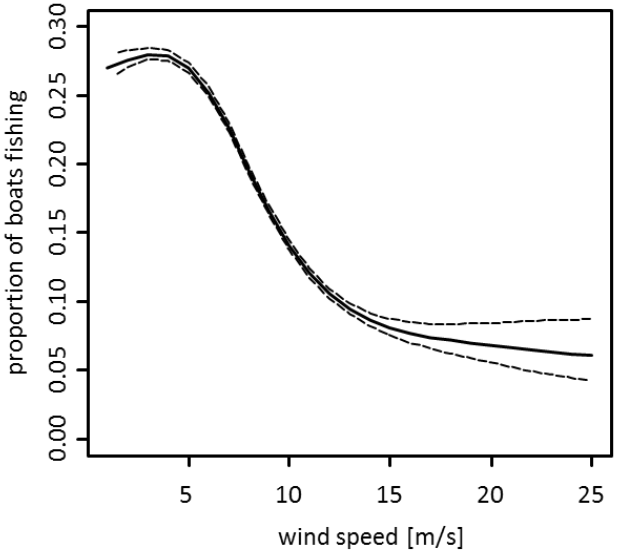
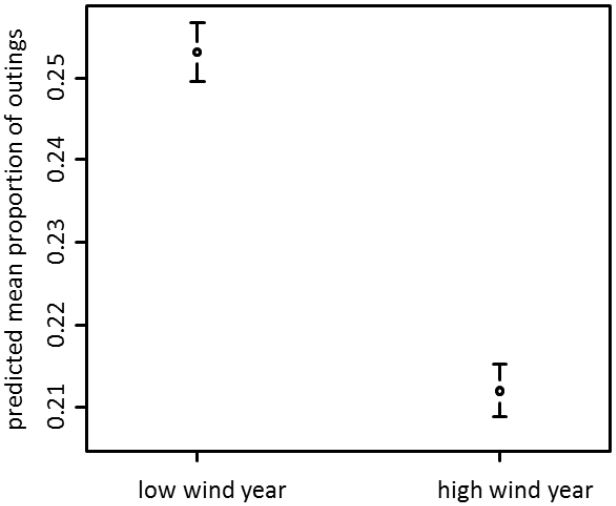
- Summary of potential impacts and negative outcomes for SA fisheries and aquaculture



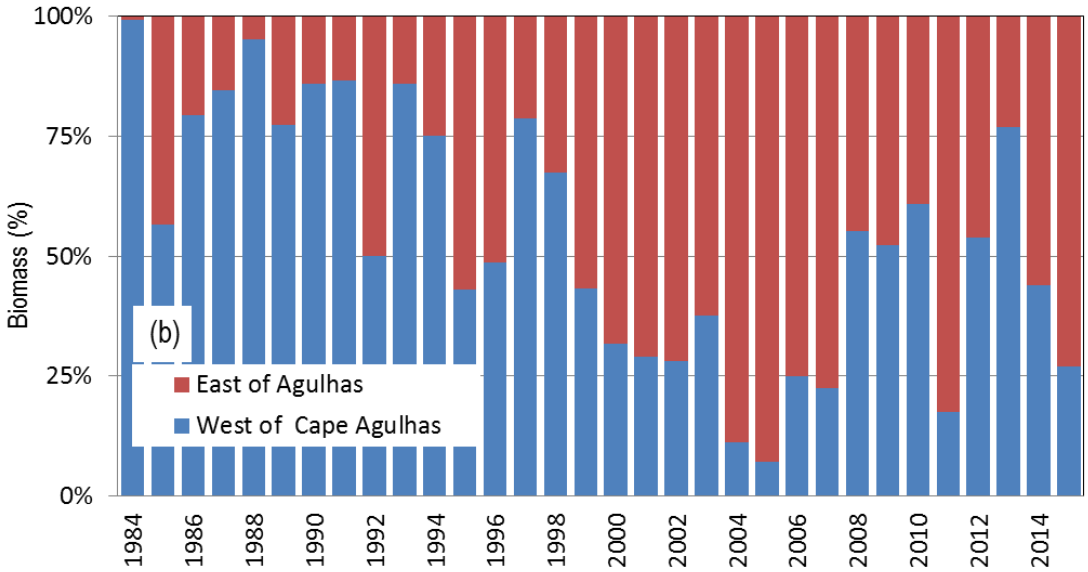
For example….line fish…. Deteriorating weather conditions have resulted in a significant decrease in the number of suitable sea-days over the last 2-3 decades (Kerwath et al. 2016)

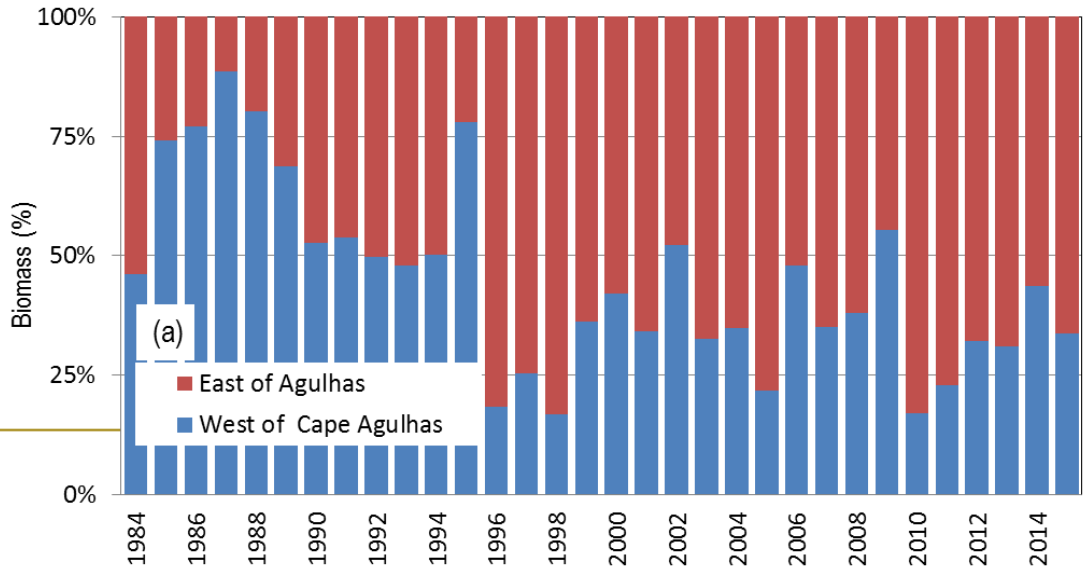






For example….small pelagics…. Changes in distribution for both sardine and anchovy, i.e. marked impacts on fishery (Coetzee & van den Lingen)





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CCAMP Project development: Fisheries

- Vulnerability Assessment and prioritization process: Vulnerability Workshop

Vulnerability Workshop: Objectives

To raise awareness within DAFF on CC

To synthesize vulnerability questionnaires

To inform and discuss impacts of CC

To obtain expert input into vulnerability indices

To **identify and prioritize** fisheries most vulnerable to climate change in South Africa

Ultimately to develop a Climate Change Adaptation and Mitigation Plan (CCAMP) for Fisheries Branch and for inclusion in the gazetted DAFF CCMAP Sector Plan

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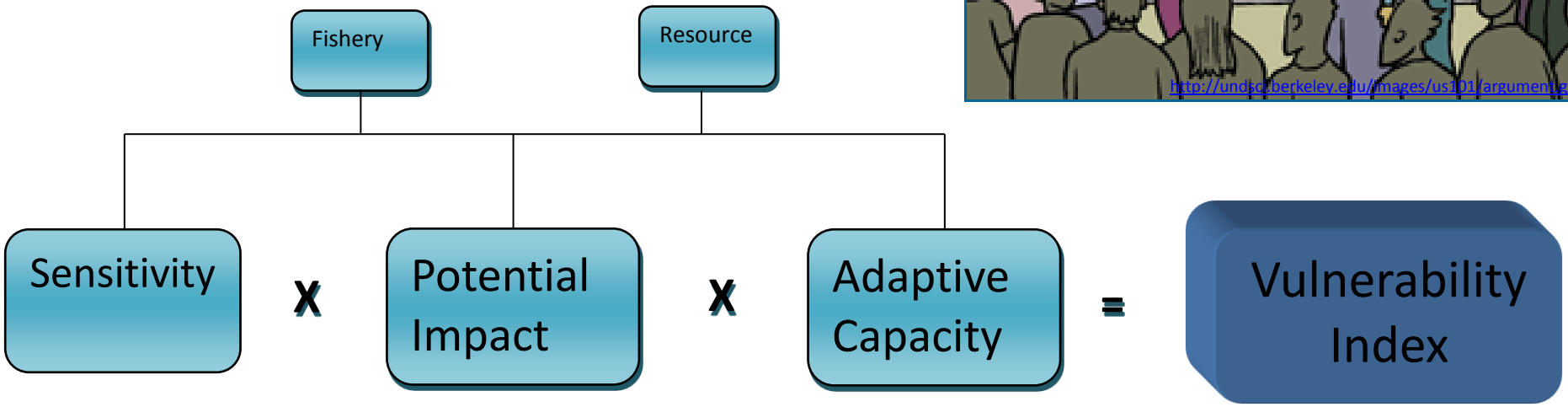
Vulnerability Workshop: Achievements

Two-day workshop held 2-3 September 2015

Stimulating discussions around vulnerability indices and scores



Vulnerability Workshop: Achievements

Fishery/Fishery group	Sensitivity Index	Impact Index	Adaptability Index	Vulnerability Index
Abalone	2	0.17	3	1.02
Aquaculture	**3**	**0.27**	**2**	**1.62**
Demersal fish	1	2.00	1	2.00
KZN prawns	3	0.08	2	0.48
Large pelagic fish and sharks	1	0.29	1	0.29
Linefish				
Commercial (small-boat)	**3**	**2.54**	**3**	**22.86**
Recreational	1	0	1	0
Small-scale	**3**	**3.00**	**2**	**18.00**
Netfishery	3	1.01	4	12.12
Demersal sharks	3	0.01	2	0.06
Rock lobster				
South Coast	1	0.09	2	0.18
West Coast	1	0.79	2	1.58
Small invertebrates and seaweed				
Oysters	1	0	3	0
White mussels	1	0	3	0
Seaweed	1	0.02	3	0.06
Small pelagic fish				
Sardine	**3**	**1.38**	**2**	**8.28**
Anchovy	**3**	**1.88**	**3**	**16.92**
Squid (jig fishery)	2	0.50	1	1.00

Identified and prioritized fisheries most vulnerable to climate change in SA

i) Line fish

ii) Small pelagic fish;

iii) Aquaculture (because sector relatively new)

Mini-workshops: adaptation options

Half-day series of mini workshops to develop adaptation options held for

i) Aquaculture 4 December 2015

ii) Small Scale Fisheries and Line Fish 10 December 2015, and

iii) Small Pelagic Fisheries 19 January 2016

Mini-workshop Achievements

E.g.....Adaptation Priorities table for South Africa's linefisheries

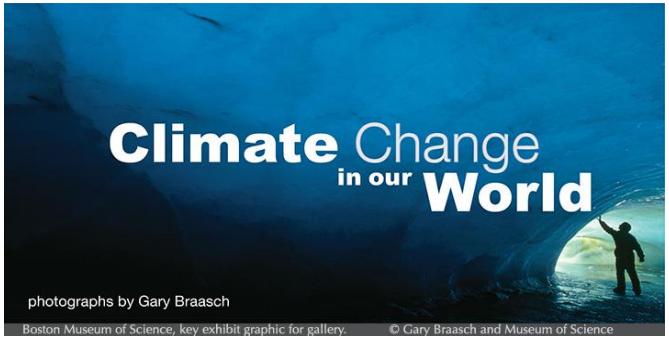
Threat	Species/Group affected	Region	Time scale	Possible adaptation measure(s)	Partners
General	Inshore ecosystems, fishing communities, commercial fishers.	All	Short to long term	It is important to ensure that the 'high level' strategies essential for good governance are effectively implemented including EAF, collaboration and co-management with stakeholders, international liaison etc	All: governmental, NGOs, private sector, fishing industry, fishing communities.
General	Inshore linefish species	All	Short to long term	Linefish fisheries depend on a number of inshore species that are susceptible to both coastal and marine impacts. Necessary to facilitate interaction between different authorities and implementation of the Integrated Coastal Management Act.	National and provincial governments, local authorities.
Several threats – changes species' distribution, bad weather, social disruption, reduced catches…..	Fishing communities, commercial fishers.	All	Short to long term	i) Facilitation and support for better organisation at local level (i.e. cooperatives). Combination of community-based initiatives combined with cooperative governance. ii) Recognition and protection of fishers in law (e.g. protect rights of small-scale fishers - SSFP, declare exclusive fishing zones). iii) Establishment of disaster fund for fishers to cover events such as lobster walkouts, recruitment failures. Fishers generally not included in government agriculture relief. iv) Strengthen capacity for social work to facilitate development and empowerment of local communities and connecting people for development adaptation strategies, management plans.	DAFF, DTI, local community, local business, provincial government and local authorities, NGOs, fishing industry, fishing communities.

CCAMP Project development: Fisheries

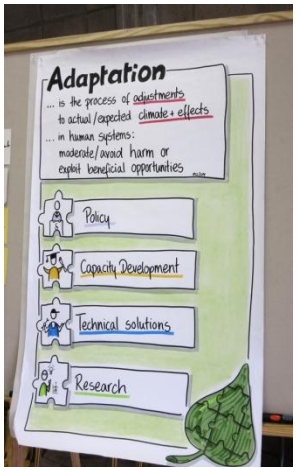
- Mitigation and Adaptation Plan: Adaptation to Climate Change Workshop

Adaptation Workshop 11-12 October 2016: Objectives

To inform all IAPs of the current DAFF CCAMP and process of developing Fisheries Component



To broaden consultation on possible adaptation measures for 3 most vulnerable fisheries and rest of 17 fisheries



To **select and prioritize** implementable adaptation measures as input to the Fisheries-independent Climate Change Adaptation and Mitigation Plan (F-CCAMP)

Adaptation Workshop Achievements

Adaptation plan tables developed for ALL sectors, e.g. New Fisheries

Threat	Impact	Main species affected	Region/ Time scale	Possible adaptation measures
Decreased and/or more variable resource abundance	Decreased catches 	Octopus	All areas/ Immediate to 50 years	Improve abundance statistics Collect morphometric data Increase research in octopus farming Independent monitoring sites. Continue/ expand existing surveys or develop surveys and monitoring sites where not available Development and adherence to management protocols
Decreased and/or more variable resource abundance	Decreased catches 	Horse mackerel		Limit the number of operators Reduce catch limits Increased observer program .

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Aims and Scope of the Workshop: Research as an Adaptation Tool?

Mitigation and Adaptation Plan: Research as Adaptation to Climate Change Workshop

Research Workshop: Objectives

To...

inform IAPs of current research on CC

discuss overarching questions and approaches regarding research into CC

identify possible collaborators, institutions and funding agencies

initiate development of an integrated research plan

Aims and Scope of the Workshop: Research as an Adaptation Tool?

Day 1

S1-*Intro*

S2-*Are Our Oceans Changing in response to CC?*

-Atmospheric drivers? SST?, Acidification, de-oxygenation

-Zooplankton? Aquaculture, Coastal ecosystem, Inshore/Offshore etc

S3-*Overaching Research Themes*

Day 2

Recap

S4-*Research Tools*

-Current monitoring programmes?

-Models (Oceanographic)

-Models (Biological)

-Experimental research, registers?

S5-*Developing Research Approaches*

Day 3

Overview

S6-*Research Collaboration and Funding*

S7-*Synthesis and Closure*

Aims and Scope of the Workshop: Research as an Adaptation Tool?

Topics assigned "High Priority" at previous DAFF workshop.

How can we build on this?

Research topic	Species
Continue and improve current monitoring of abundance and distribution	All
Improve understanding of effect of environment on above	All
Improve understanding of the effect of changes in environment on behaviour	Most
Improve current population models, particularly by allowing for greater natural variability in stock size	All existing population models
Improve understanding of effect of environment on life cycles and biological parameters (growth, maturation rates, etc.)	Most
National programme to monitor acidification	West & South Coast rock lobster Line fish Abalone Oysters & mussels
Studies on effects of acidification on marine life	West & South Coast rock lobster Line fish Abalone Oysters & mussels
Accelerate development of electronic log-book system for real-time spatial analysis of catch and effort data	Demersal fish (inshore & offshore) Line fish

Department of Agriculture, Forestry & Fisheries (DAFF)

Fisheries Climate Change Task Team

All Presenters, Chairs, Rapporteurs & Participants

https://climate.nasa.gov/internal_resources/39/

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