

DAFF Offshore Resources Research Surveys

DEON DURHOLTZ



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forestry & fisheries

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Routine Offshore Research Surveys

DEMERSAL

Primary objective

Measure abundance of hake and other key demersal species

Design

Pseudo-random stratified, with abundance estimates obtained using the swept area approach

Coverage

Coast to 1 000m isobath
West and South Coasts surveyed separately

PELAGIC

Primary objective

Measure abundance of sardine and anchovy and redeye roundherring

Design

Transect, with abundance estimates obtained using hydro-acoustic techniques (with midwater trawling for target ID)

Coverage

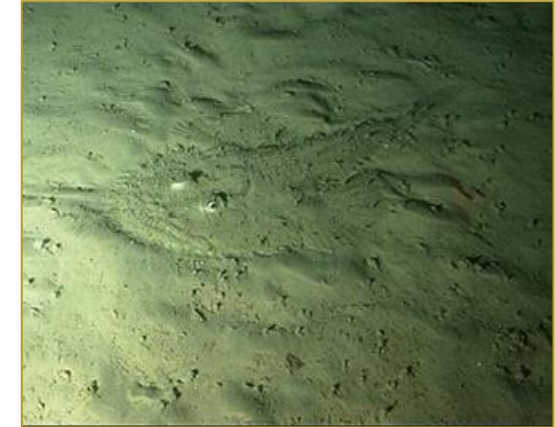
Coast to outer edge of fish distribution
West and South Coasts surveyed within a single survey



Demersal Surveys - objectives

1. Abundance and distribution of demersal fish species
2. Length frequency and biological data
3. Hydrographic data (CTD)
4. Abundance and distribution of benthic epifauna (since 2011)
5. Fulfil requests by DAFF and external scientists for data/samples

Key inputs for stock assessments leading to TAC / PUCL / Effort recommendations



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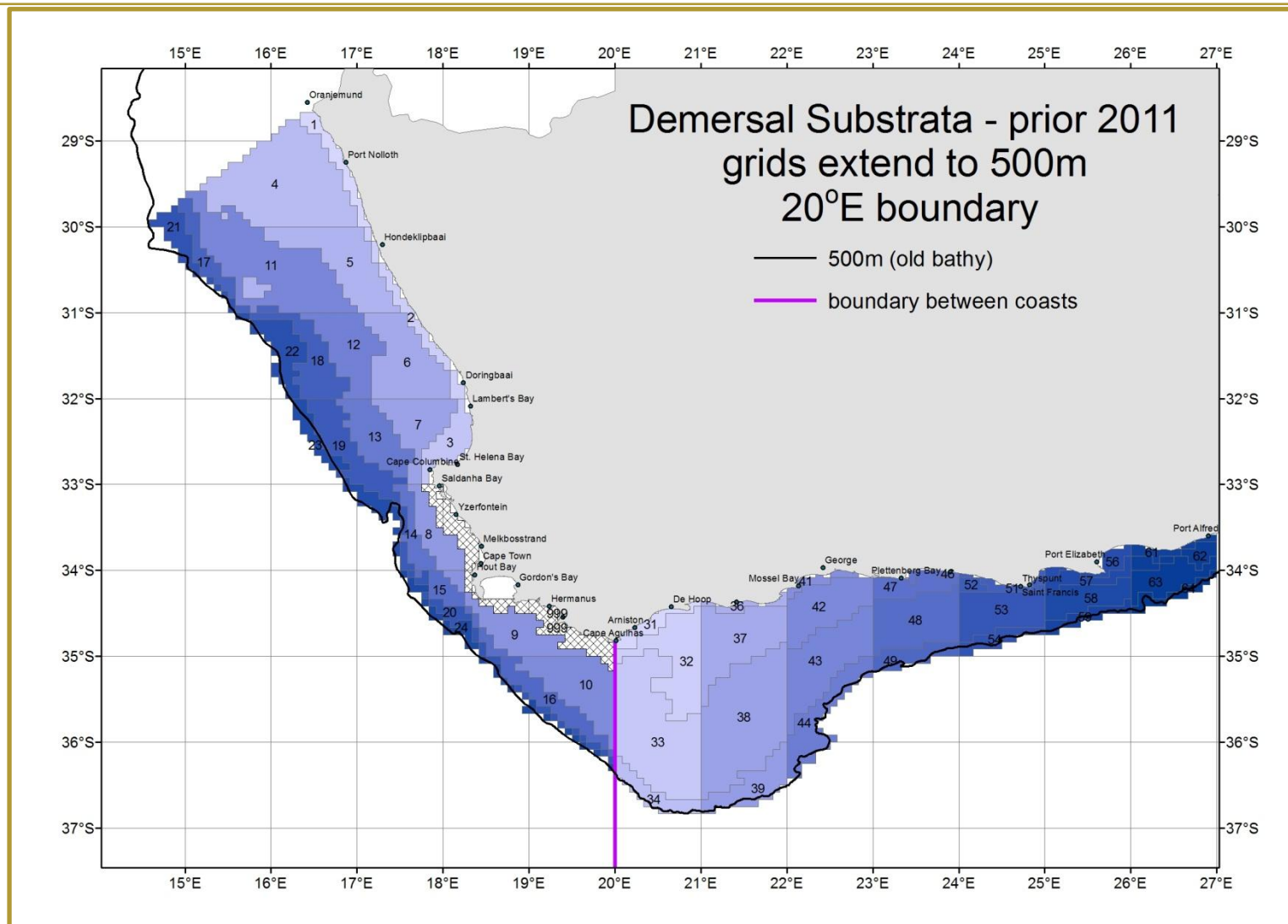
Demersal Surveys - design

West Coast

Summer
(Winter)

South Coast

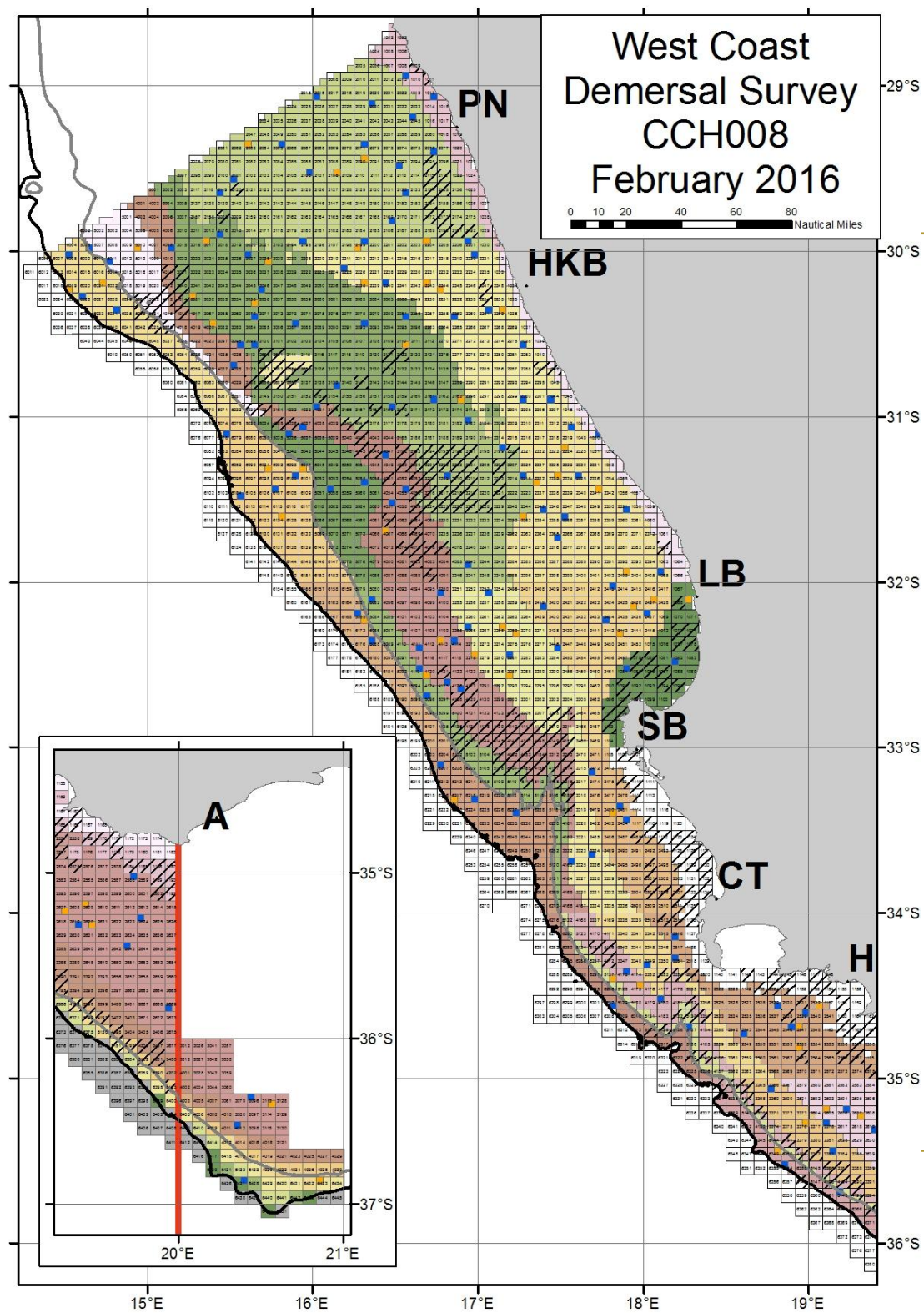
Autumn
(Spring)



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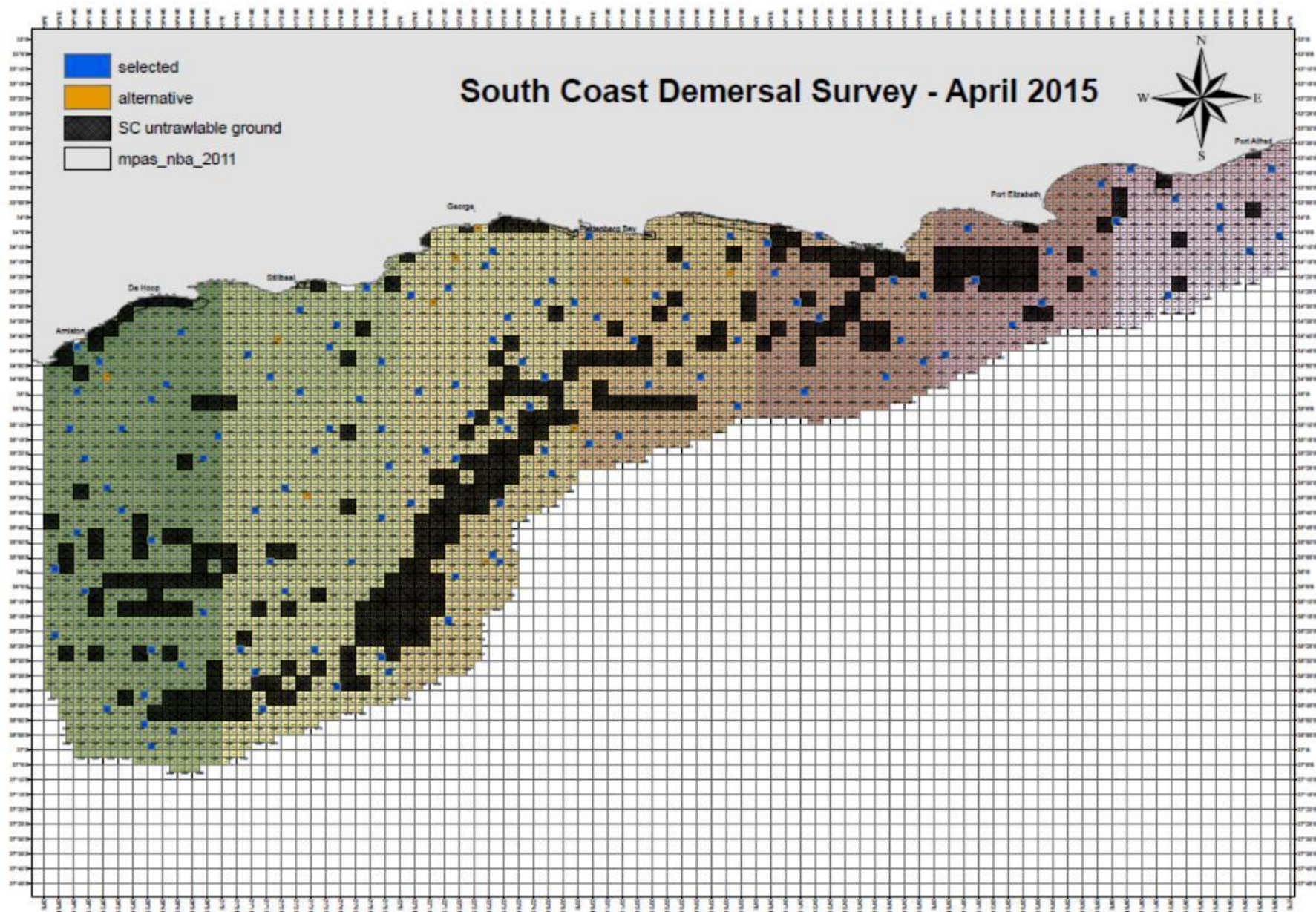
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Demersal



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Demersal Surveys – biological sampling

- Entire catch (including benthic epifauna) sorted to species level (where possible) and weighed
- Hake, elasmobranchs and squid further sorted to gender and weighed
- Length frequency data collected for all fish and squid
- Biological data (length, weight, maturity stage, stomach contents, liver weight, otoliths) collected from key species
- Other sampling (e.g. genetics, stable isotopes, taxonomy etc.)

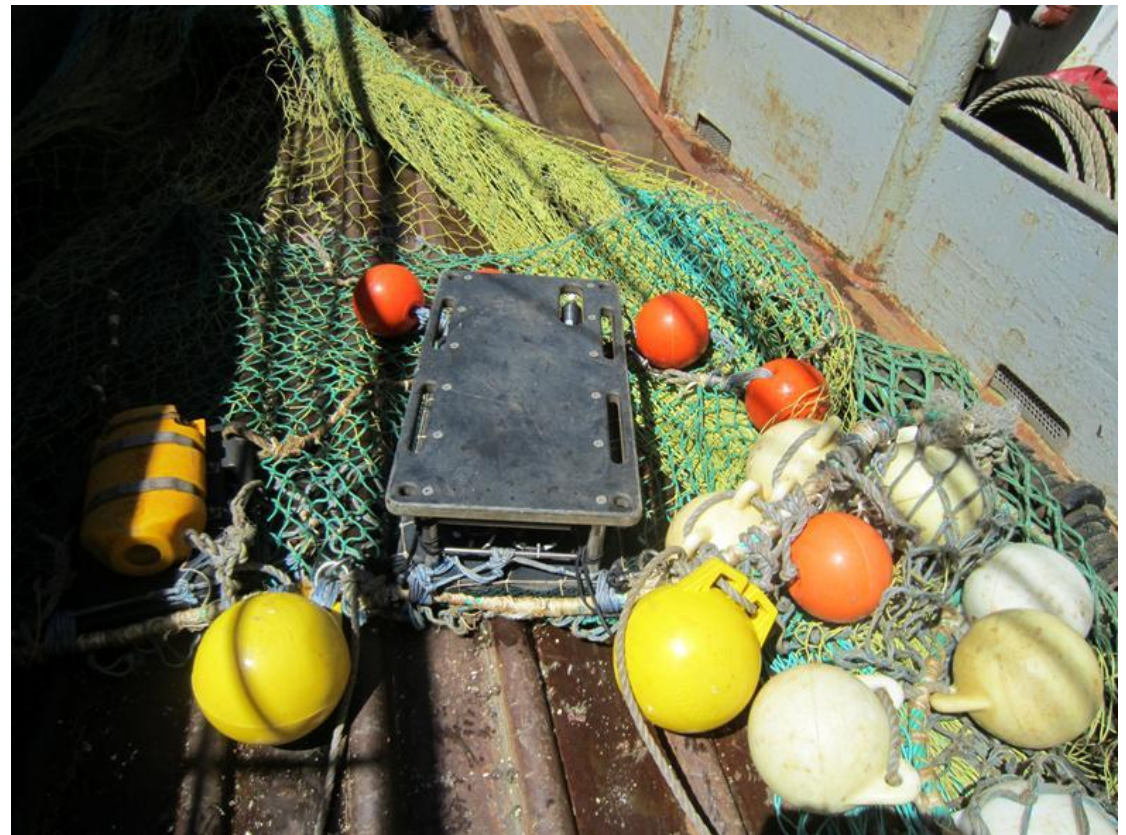


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Demersal Surveys – hydrographic sampling

2013

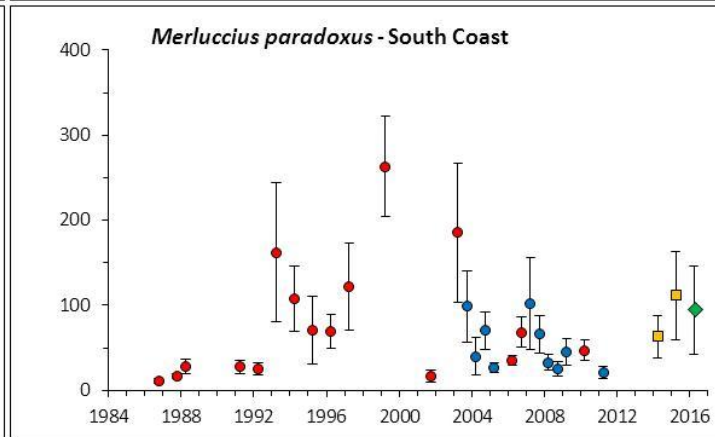
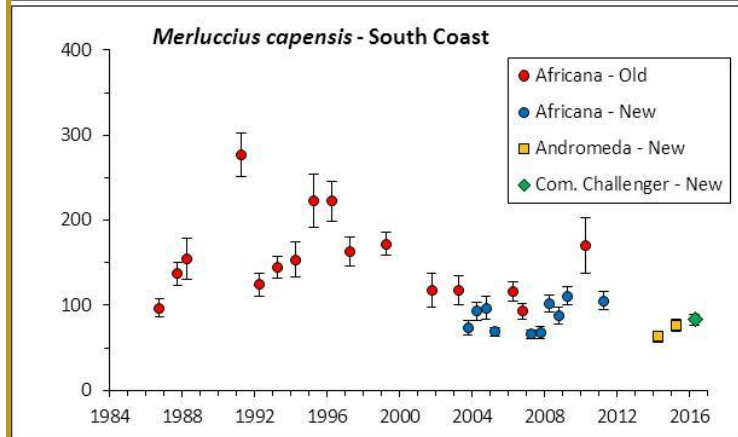
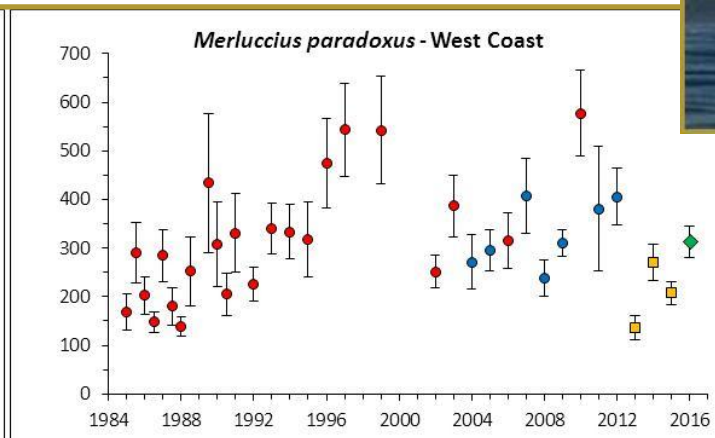
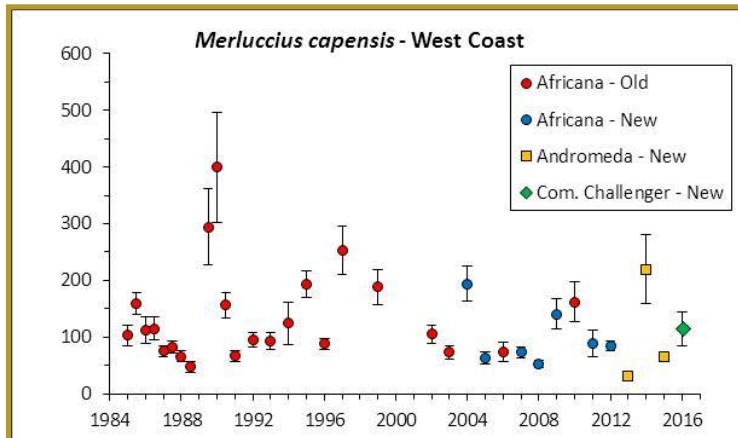


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Demersal Surveys – some issues

1. Gear change (2004)
2. Use of commercial vessels (2013 -2016)



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Demersal Surveys – summary

Year	WEST COAST		SOUTH COAST	
	Summer	Winter	Autumn	Spring
1984		AFR022		
1985	AFR028	AFR033		
1986	AFR039	AFR046		AFR048
1987	AFR050	AFR054		AFR056
1988	AFR059	AFR066	AFR063	
1989	AFR069	AFR075	AFR072	
1990	AFR079	AFR084	AFR082	AFR086
1991	AFR088		AFR093	AFR095
1992	AFR100		AFR102	AFR106
1993	AFR109		AFR111	AFR116
1994	AFR118		AFR122	AFR125
1995	AFR127		AFR129	AFR131
1996	AFR133		AFR135	
1997	AFR139		AFR144	
1998				
1999	AFR150		AFR152	
2000	NAN001		NAN003	
2001	NAN004			AFR160
2002	AFR165			
2003	AFR173		AFR177	AFR182
2004	AFR188		AFR191	AFR200
2005	AFR203		AFR206	
2006	AFR214		AFR217	AFR224
2007	AFR228		AFR232	AFR236
2008	AFR238		AFR241	AFR246
2009	AFR249		AFR252	
2010	AFR259		AFR261	
2011	AFR270		AFR273	
2012	AFR279		AFR281	
2013	AND001			
2014	AND002		AND003	
2015	AND004		AND005	
2016	CCH008		CCH009	AFR289
2017	AFR291			



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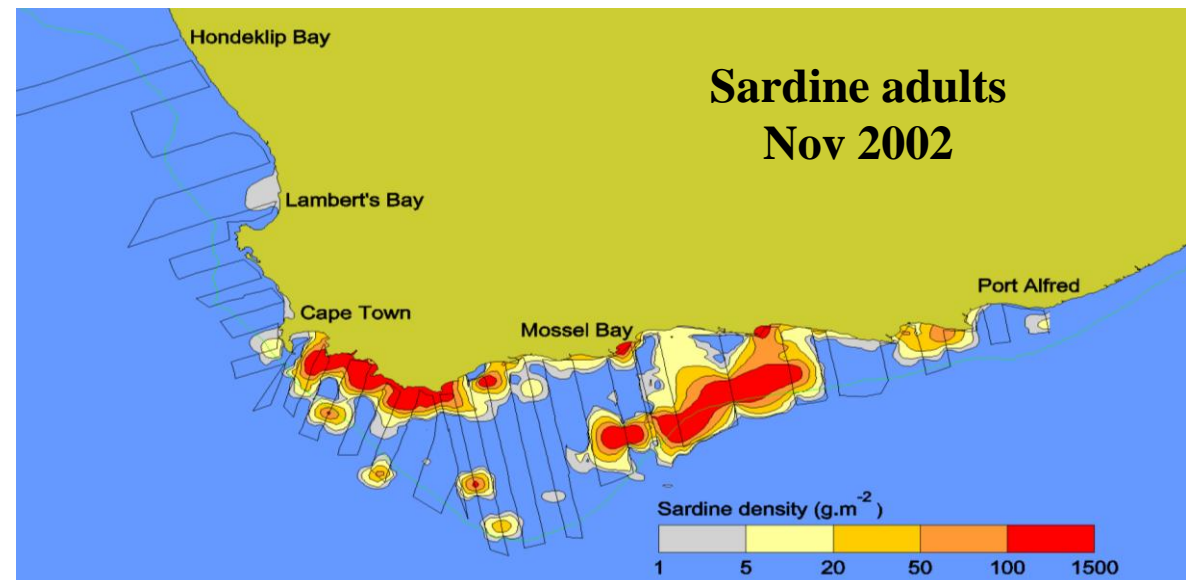
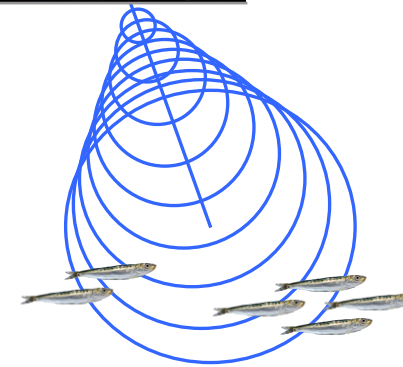
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Pelagic surveys; 2 routine surveys conducted annually; other occasional surveys (eg 2005 sardine run survey)

Recruit survey in autumn (May/June) – surveys inshore to mid-shelf between Orange River mouth and Cape Infanta (standard recruit survey area) eastward extension in recent decades; 1985-present

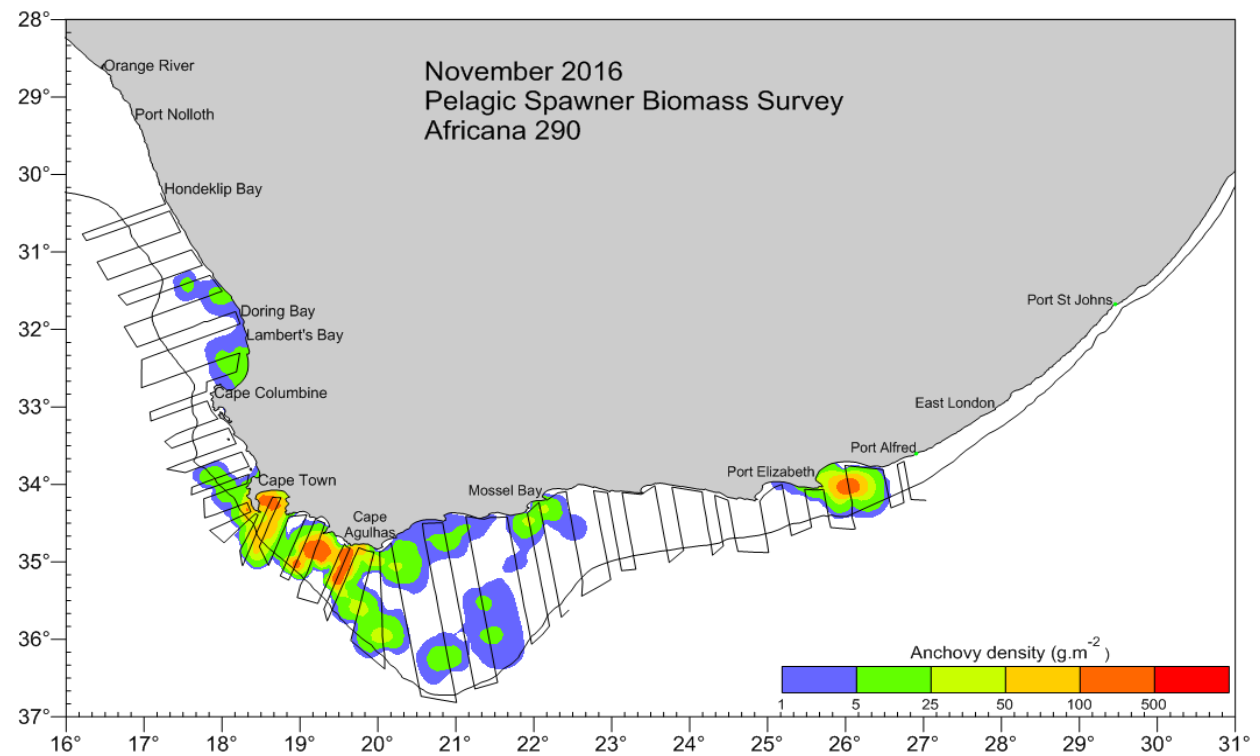
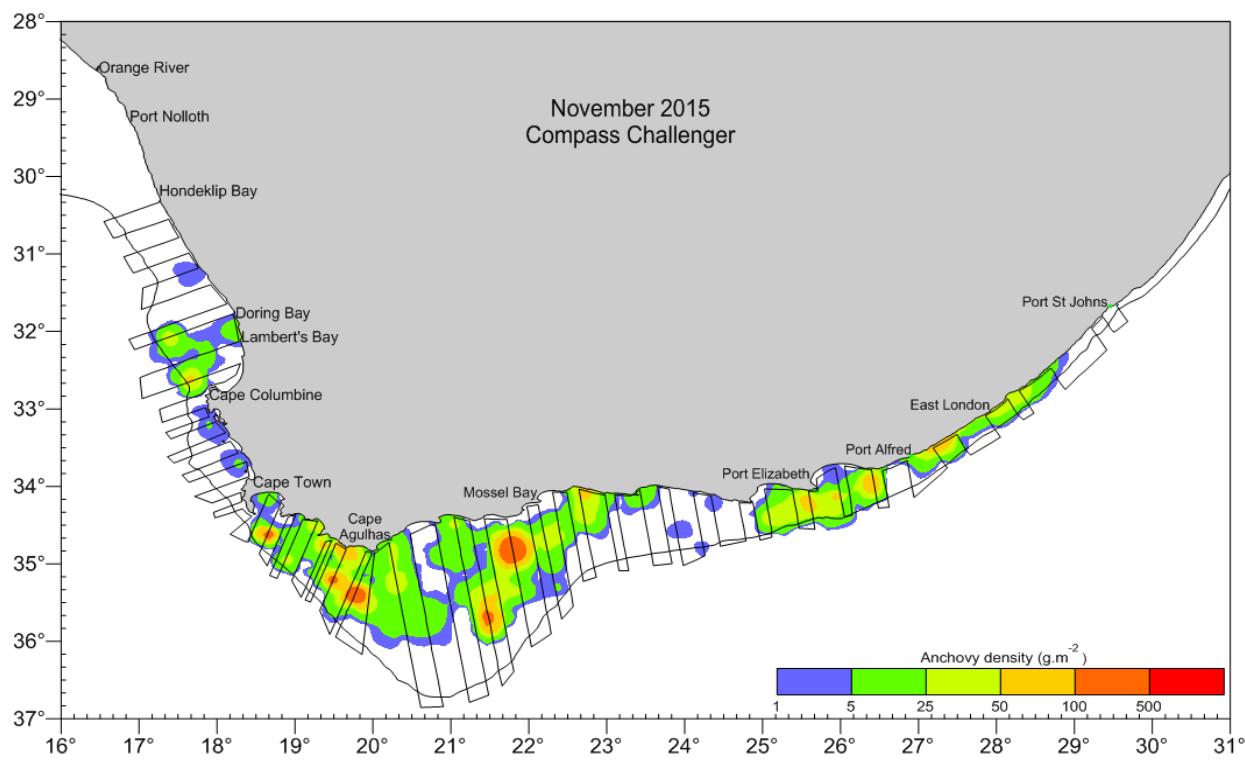
Biomass survey in spring (late-Oct to early-Dec) – surveys entire continental shelf between Hondeklip Bay and Port Alfred (standard survey area; occasional extensions further east to Port St Johns); 1984-present

Provides annual estimates of recruitment and biomass of three small pelagic species; sardine, anchovy and round herring



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Examples of anchovy
biomass distribution, 2015
and 2016

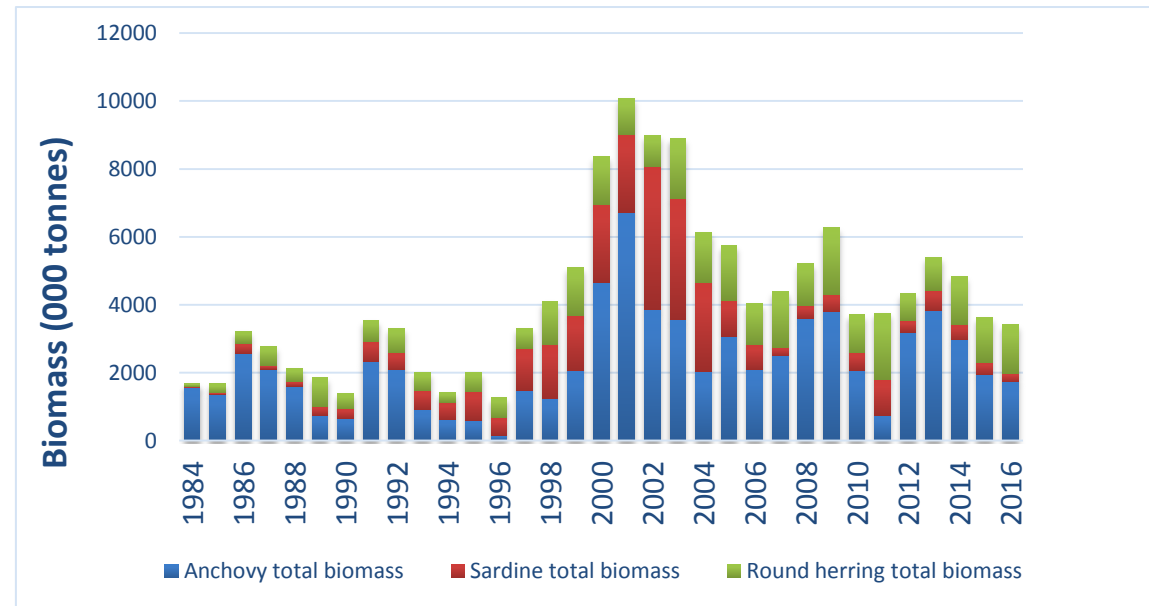
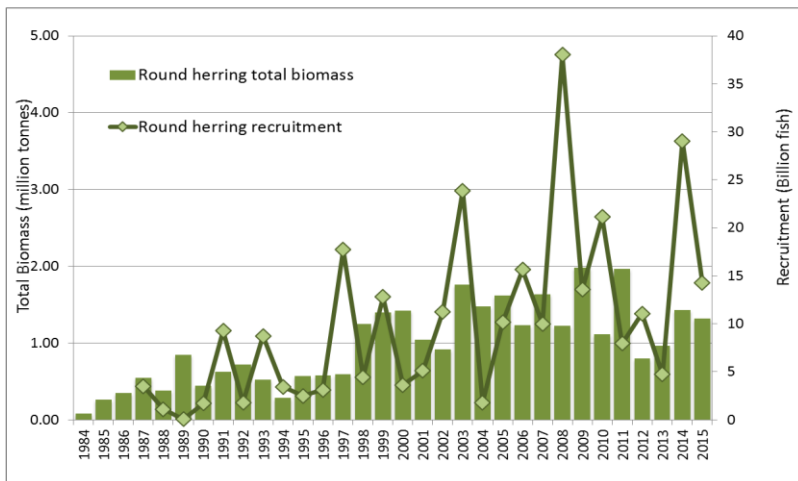
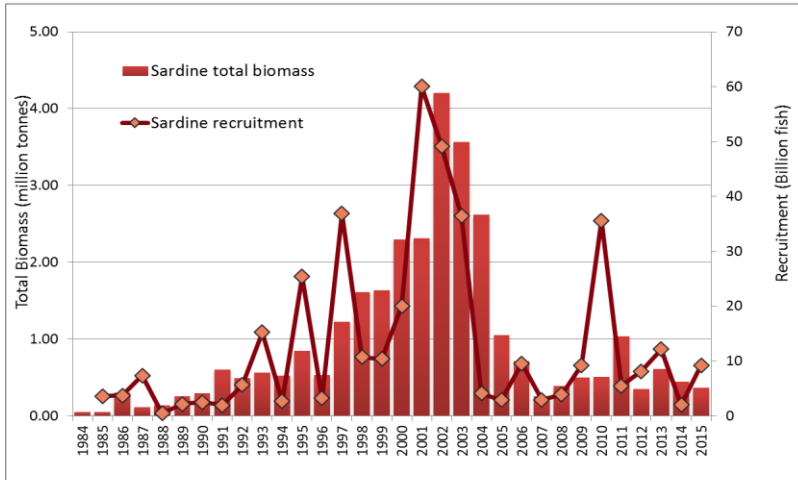
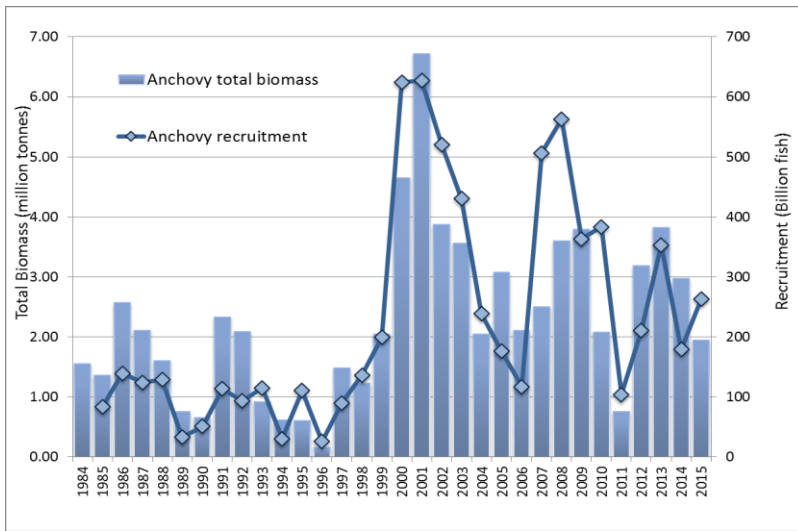


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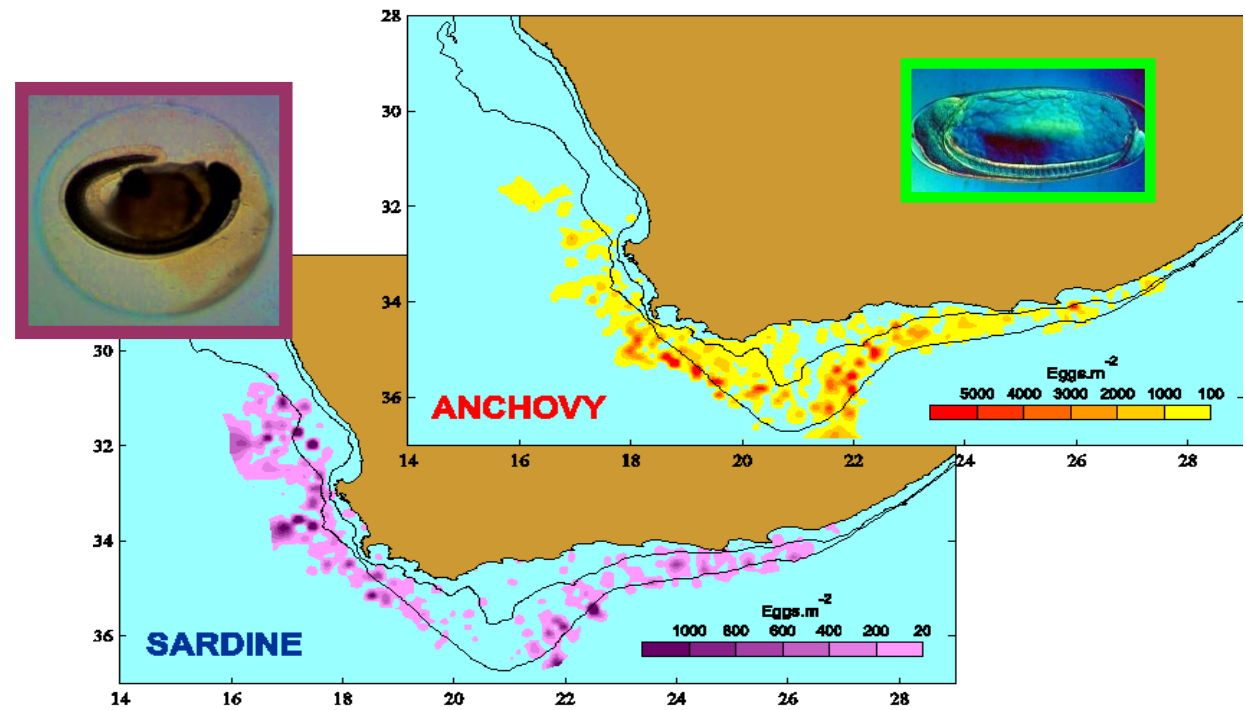
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Survey data used to generate total biomass and recruitment time-series for anchovy, sardine and round herring off SA, 1984-2015 (upper plot)

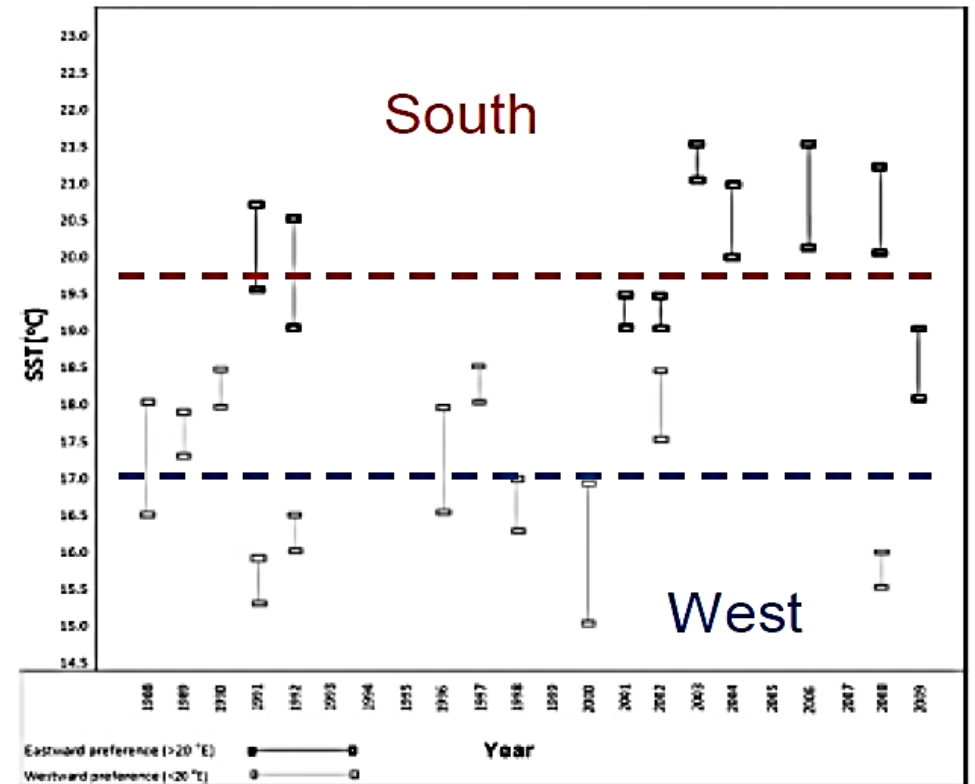
Combined total biomass of anchovy, sardine and round herring, 1984-2016



Eggs of small pelagic fish species also collected during pelagic surveys using a CalVET net and CUFES (composite distribution maps 1984-2003)



Comparison of egg abundance and concurrently-collected environmental data enables characterization of spawning habitat and how this may have changed through time – plot shows “preferred” spawning habitat of sardine off the west and south coasts, 1988-2009



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Environmental data collected near-surface along survey track (SST etc), and at selected stations via deployment of a CTD – plot shows an alongshore, inshore temperature section between East London and the Tugela Banks mapped during the 2005 sardine run survey

