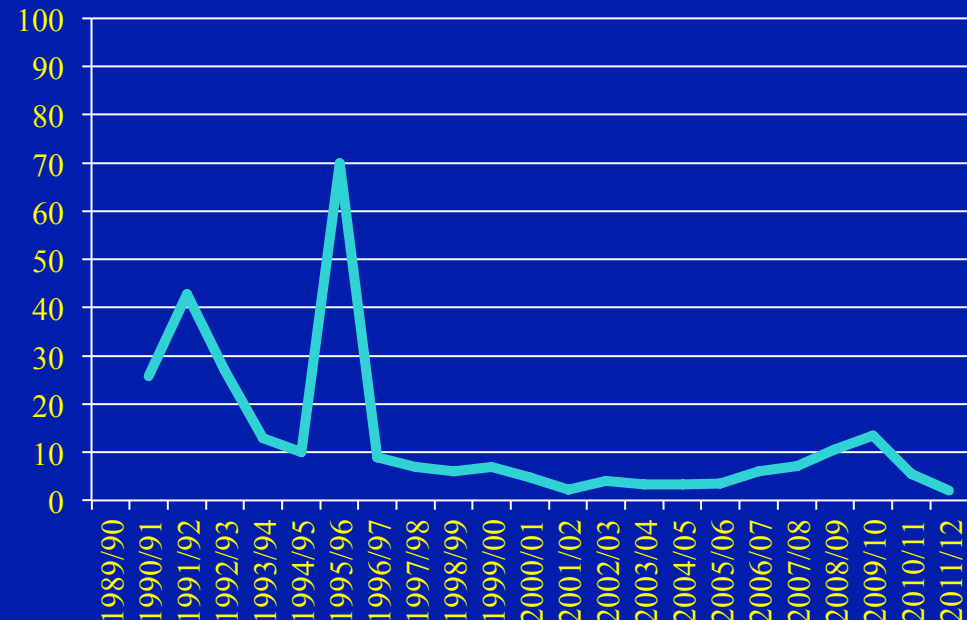
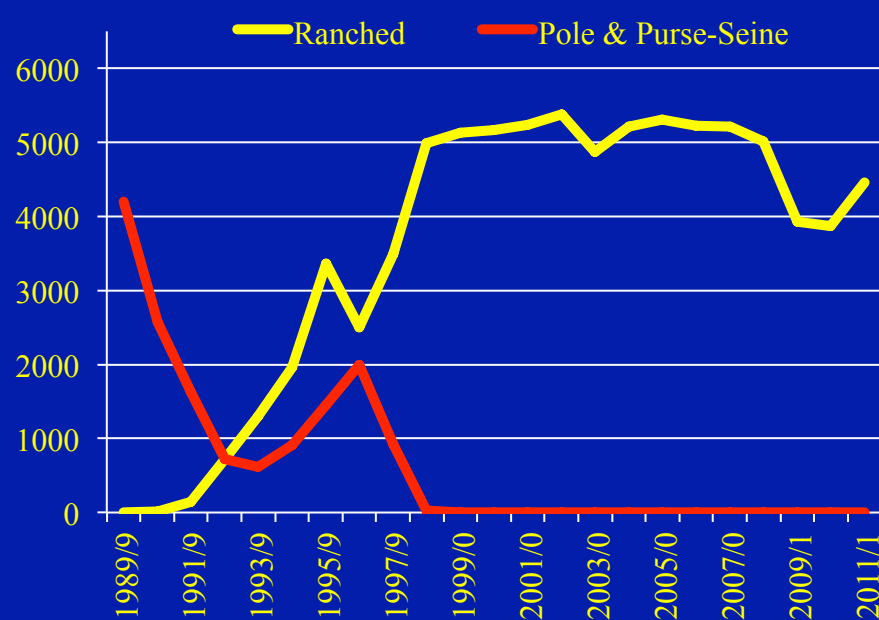


Climate Influence on Great Australian Bight Weather and Oceanography - SBT Industry Experience

Kirsten Rough
ASBTIA Research

HISTORY – Industry Evolution:

- * SBT (global distribution in southern hemisphere) is an international fishery
- * Surface fishery for SBT off Australia became commercial early 1950's
- * By 1970's the fishery routinely used planes, pole vessels and purse-seiners (mostly for cans)
- * Global catch peaked at 81,750 tonnes in 1961 (Aust. catch peaked at 21,500 tonnes in 1982)
- * Tri-lateral Quota restrictions 1984/85, subsequently reduced until 1988/89 (Aust TAC 5,260)
- * Fluctuating mortality through development phase of ranching (catch techniques, basic husbandry, infrastructure)
- * 1st disease incursion 1993 was catalyst for establishing baseline health data set
- * Knowing SBT characteristics through entire farming cycle enables rapid focused response



WHY am I here?

Stark change in SBT distribution in the 2011-12 season

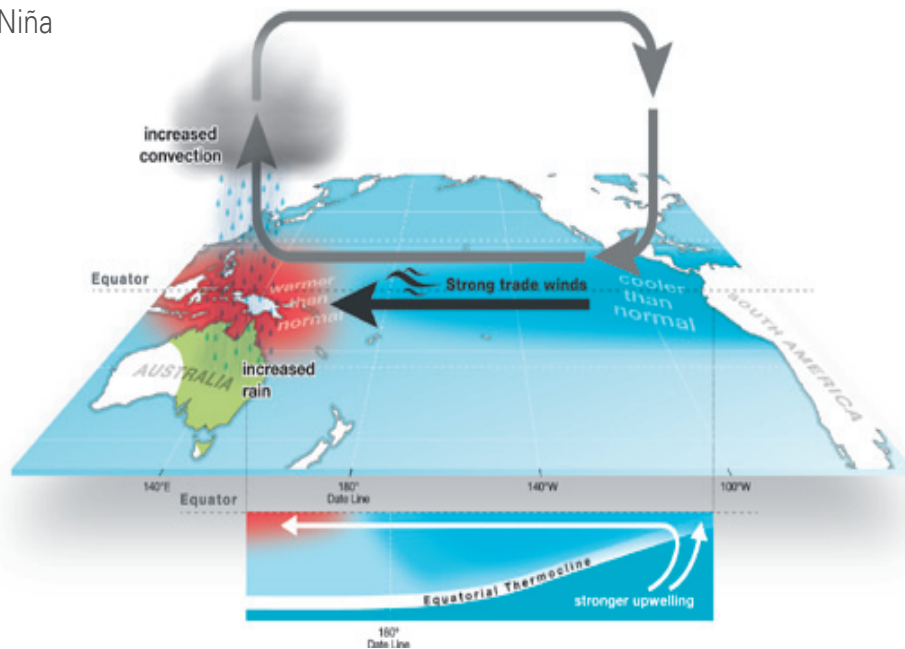
- * SBT catches span a distance of 460km (typically <220km)
- * Lower proportion of larger sized SBT (2-4yr olds)

Industry clearly wanted to know what was going on.....

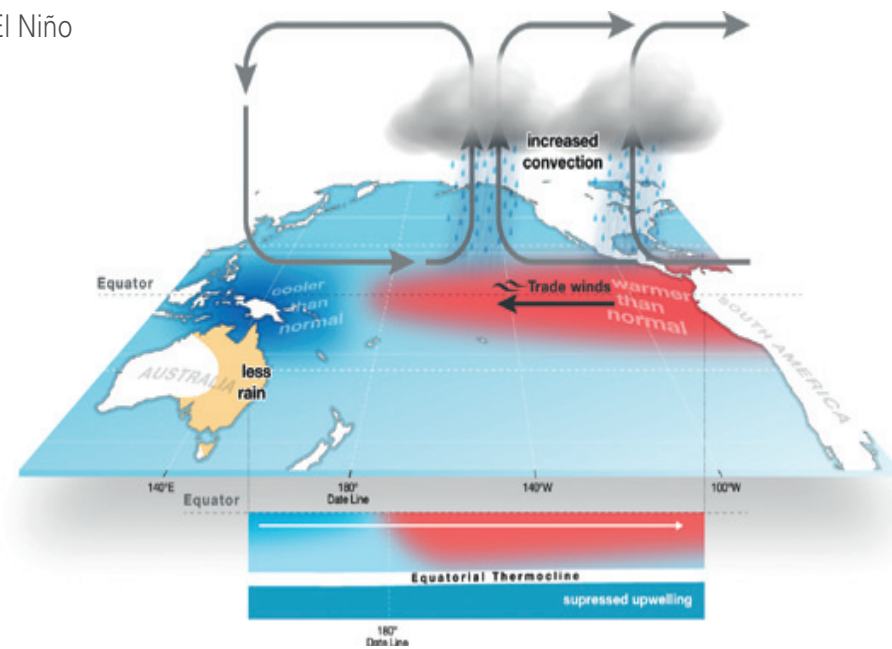
..... Combined influence of climate systems and MSS

ENSO phases

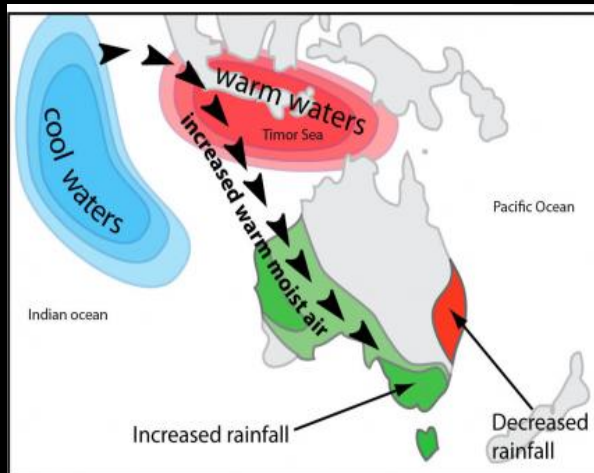
La Niña



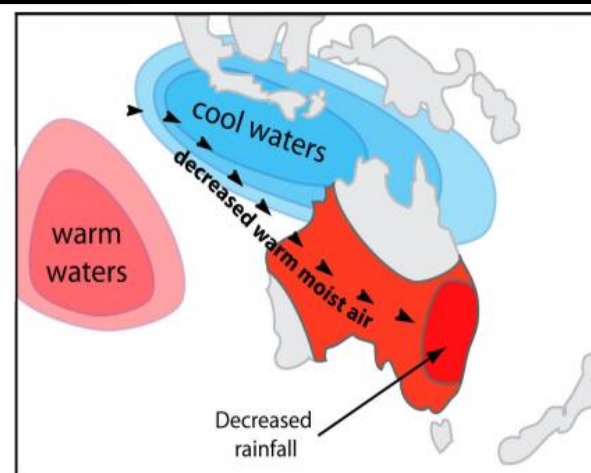
El Niño



IOD phases



Negative phase: cool Indian Ocean water drives moist warm air and brings normal rainfall.



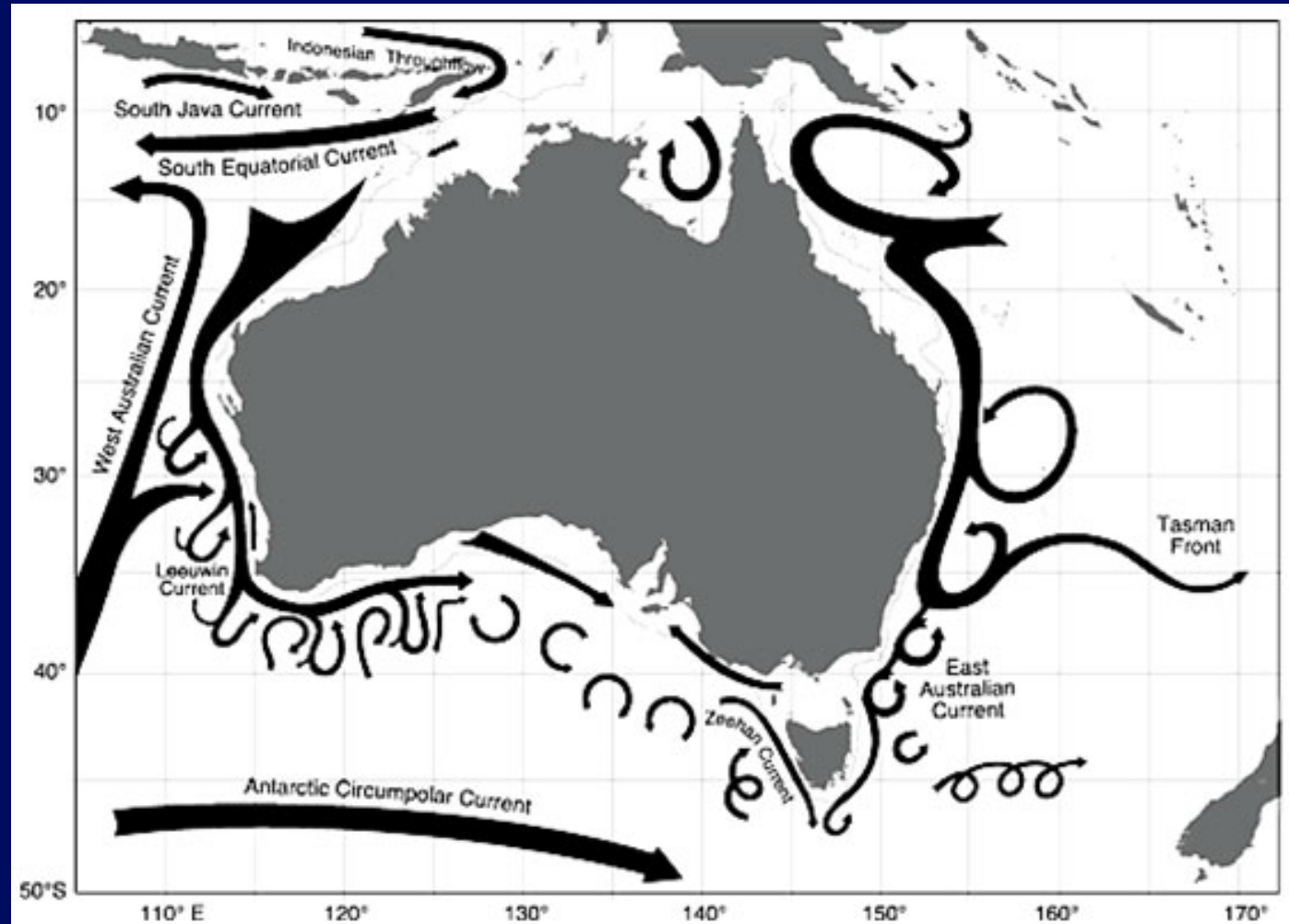
Positive phase: warm Indian Ocean water leads to weaker, drier winds and less rainfall.

HOW DO THESE CLIMATE SYSTEMS IMPACT IN GAB?

The Leeuwin Current (LC) is main influence of SST in GAB

The nature of the LC varies between years and within fishing seasons

Expression of LC influenced by climate systems (Pacific Ocean, Indian Ocean & Southern Ocean)



Pre-season SST and currents

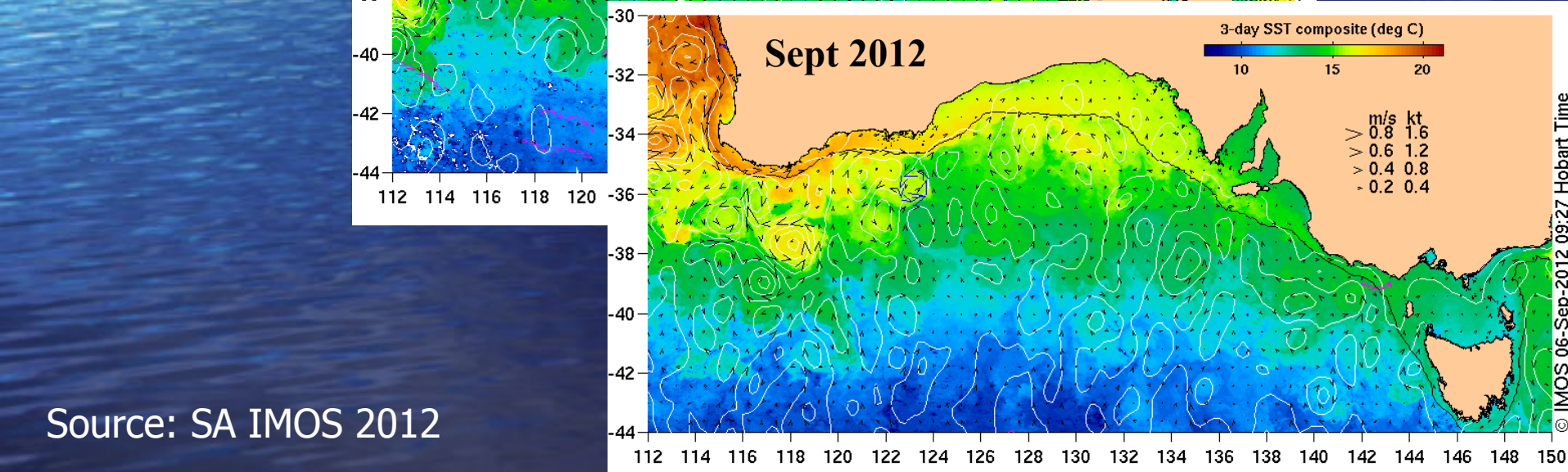
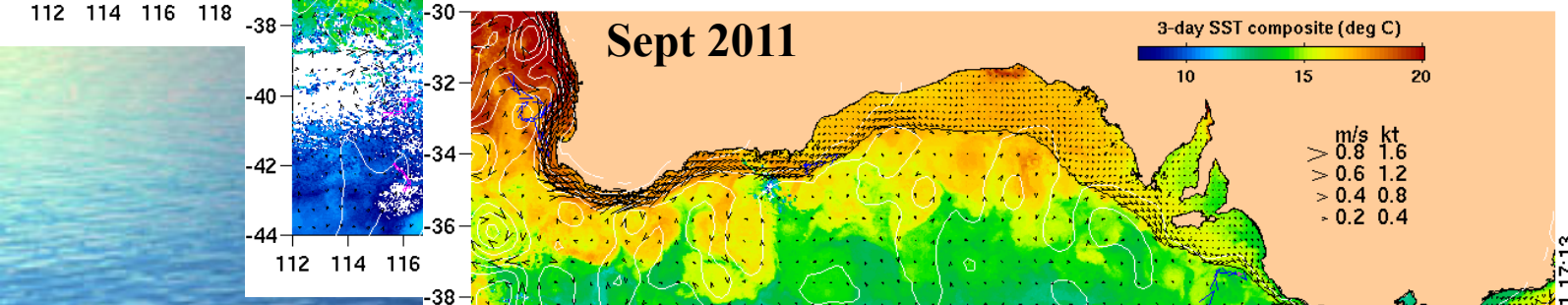
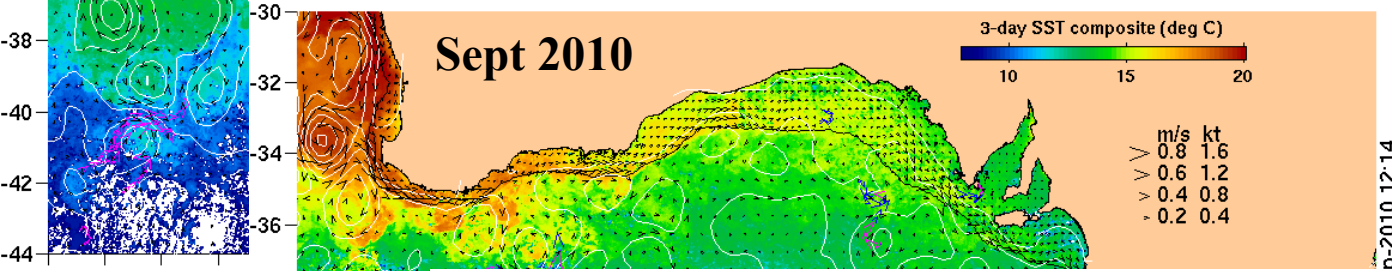
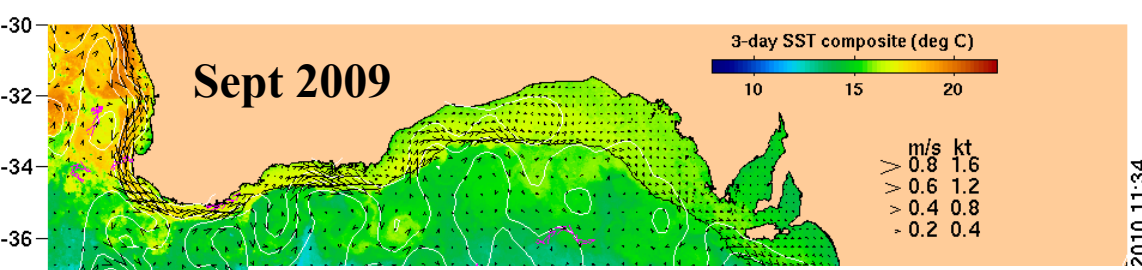
September:

2009-10

2010-11

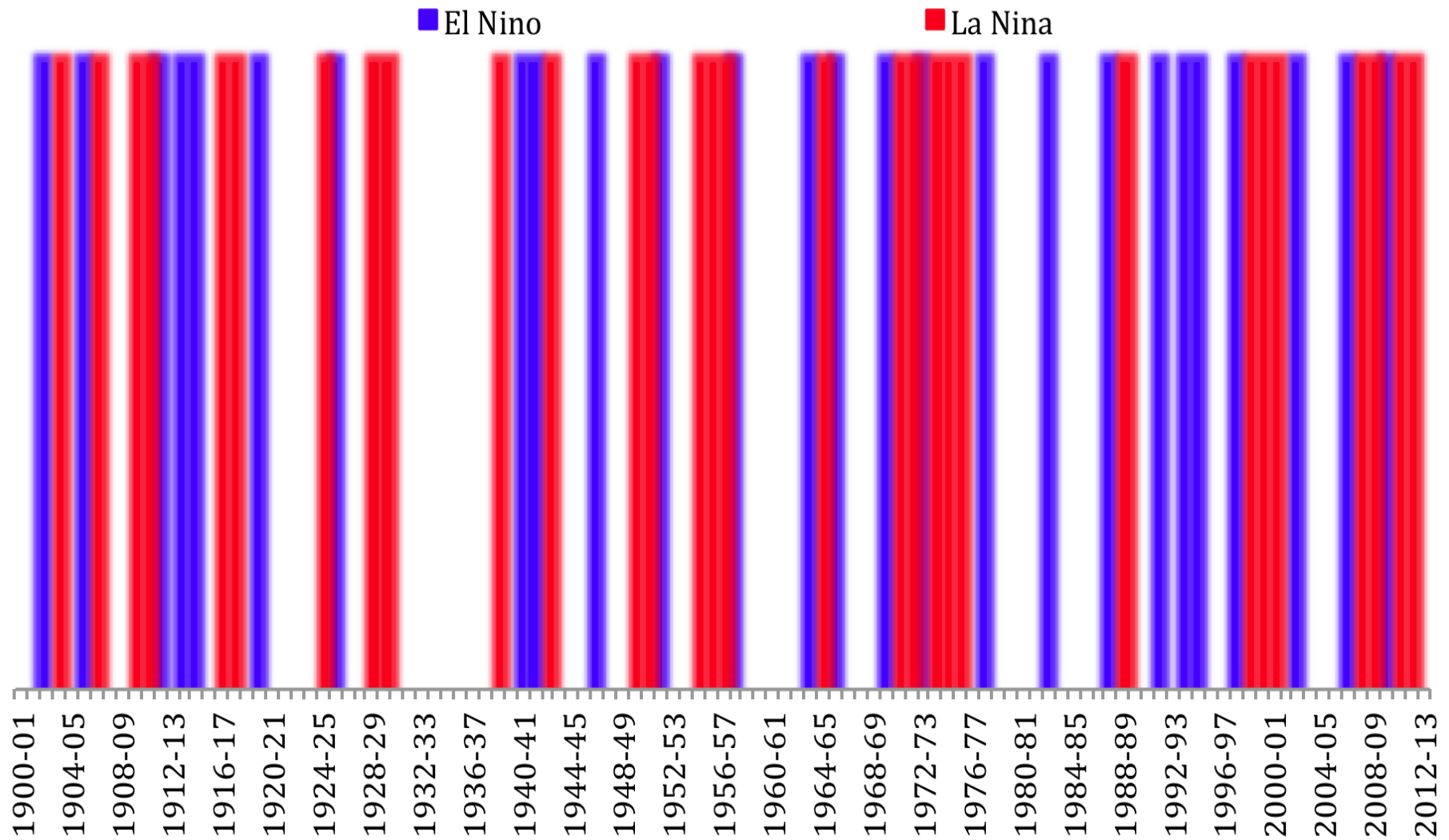
2011-12

2012-13



Source: SA IMOS 2012

ENSO phases from 1900 (prepared from info provided by BOM)



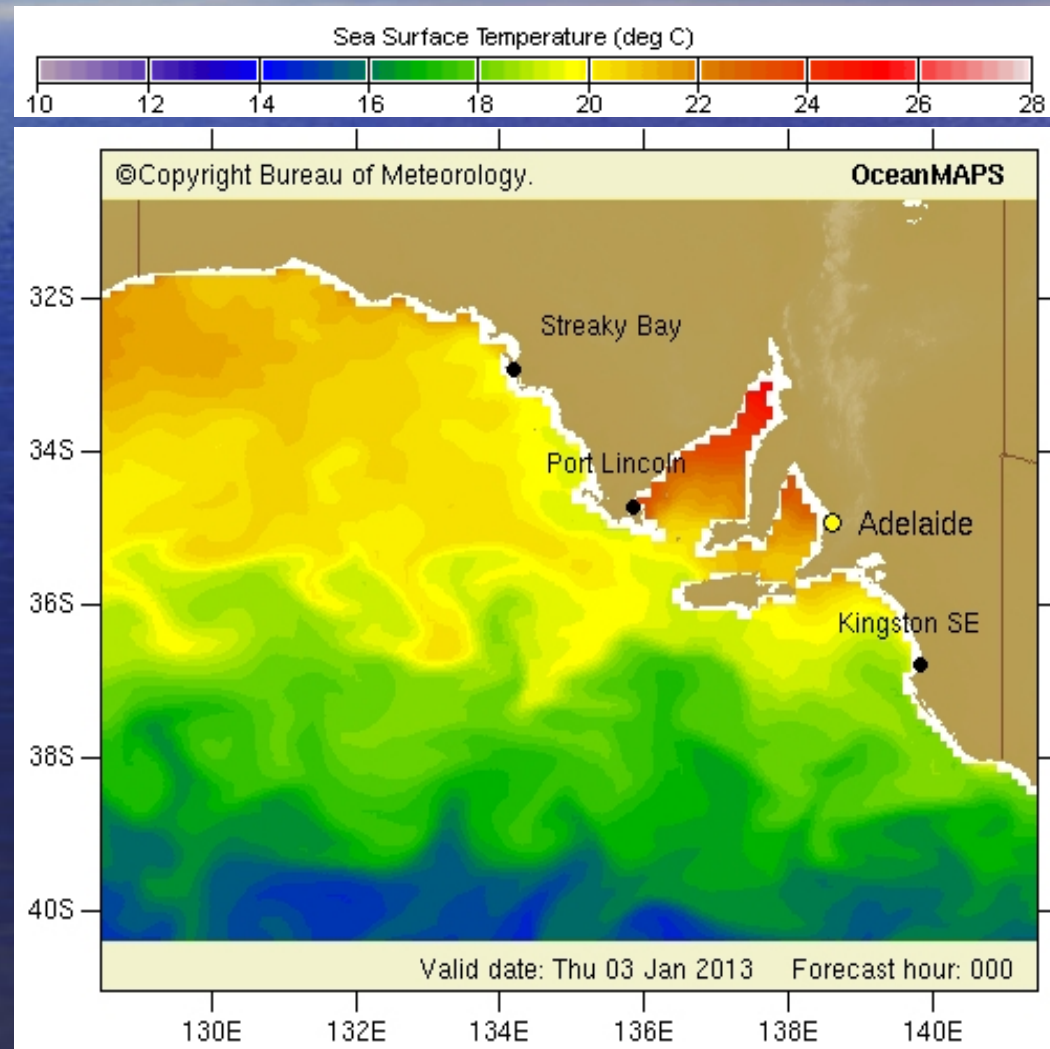
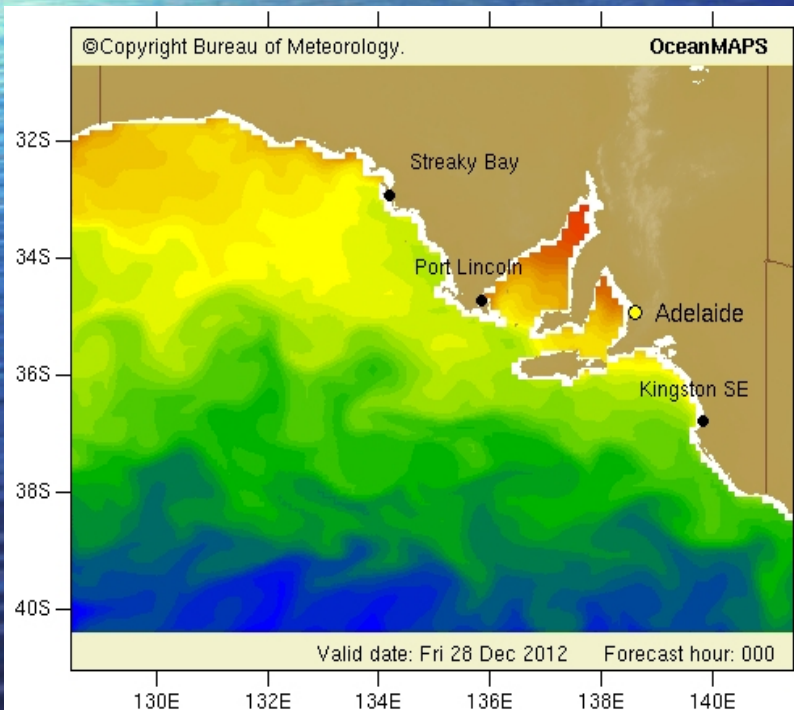
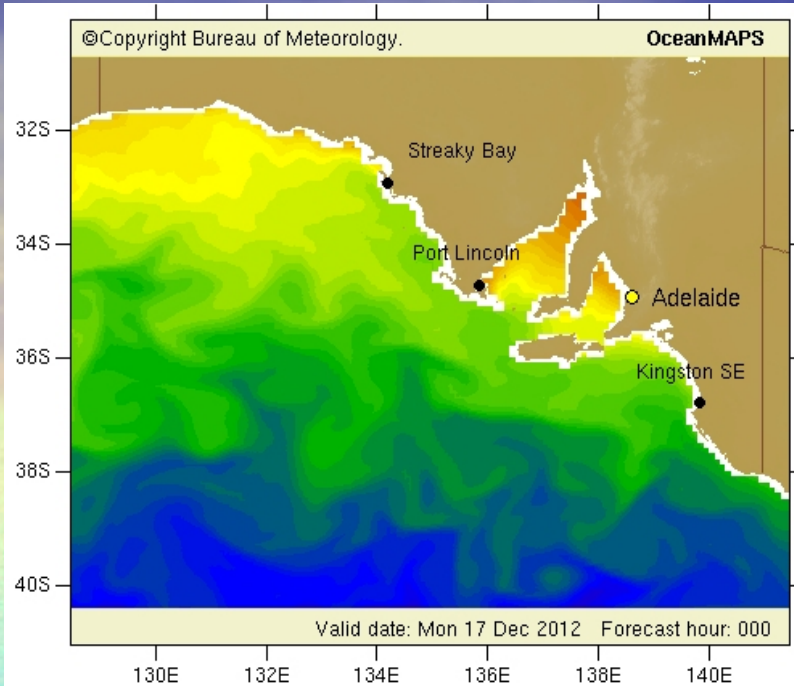
2013 CLIMATE SYSTEM SYNOPSIS:

- PRE-FISHING: La Nina influence (less influence IOD, no adverse influence southern ocean system)
- FISHING SEASON: El Nino conditions (Jan to April)
- Essentially many similarities to other seasons
 - 2013 influenced by a water mass NOT associated with the major climate systems

SBT habitat expansion

From 17th December

- to 28th December 650km
- to 3rd January 780km



Situation for NEXT fishing season?

2014 CLIMATE SYSTEM PROJECTIONS:

- ENSO Indications now (from June) suggest 2014 will be same as 2009, 2011, 2012 & 2013 (La Nina through critical period leading into fishing season)
- 2014 likely to have added influence of IOD (as occurred through 2012)
- No firm signal from Southern Ocean at this stage (21day forecast, current situation is between that of 2012 and 2013)

FINALLY: from our experience.....

**1. Fish haven't changed, the environment is –
The faster we embrace this, utilise available information
and adapt our practices = the more successful operations
will be into the future**

2. Targeted research can provide solutions

*Collaborative project ASBTIA/CSIRO/BOM to forecast spatial
distribution of SBT habitat in the GAB*

- potential for 2-3 month predictive capacity*
- better understanding of SBT use of GAB*
- ability to rapidly adapt to anomalous seasons*

Acknowledgements and sources of information:

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BOM: <http://www.bom.gov.au>

CSIRO: Jess Farley <http://www.csiro.au>

IMOS: <http://www.oceancurrent.imos.org.au>

SARDI - Oceanography: Mark Doubell <http://www.sardi.sa.gov.au>