

# Taking Stock

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*Why are plankton time series so difficult to maintain funding for?*

Flat budgets

Increasing cost of collection and analysis (ships & salaries)

Alternative needs for funds



Tom Finch

# Stormy outlook for long-term ecology studies

The closure of a 40-year project to understand and protect seabirds shows the false priorities of funders, warns [Tim Birkhead](#).

21 October 2014

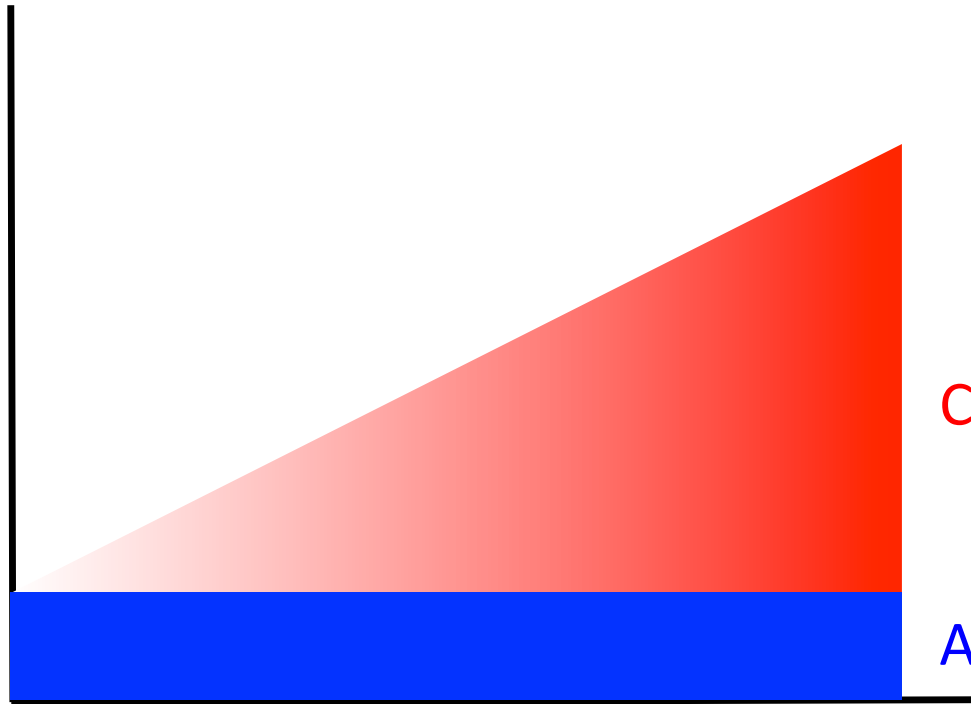
- 40-y study of guillemots off Wales
- Climate change  $\implies$  storms  $\uparrow \implies$  survival  $\downarrow$   
 $\implies$  phenology advancing
- Funding stopped

*Value of plankton time series increases with time series length*

*They become increasingly relevant to large-scale phenomenon such as ecosystem degradation and climate change*

*Thus their value transcends their intended use for fisheries management to use in environmental policy*

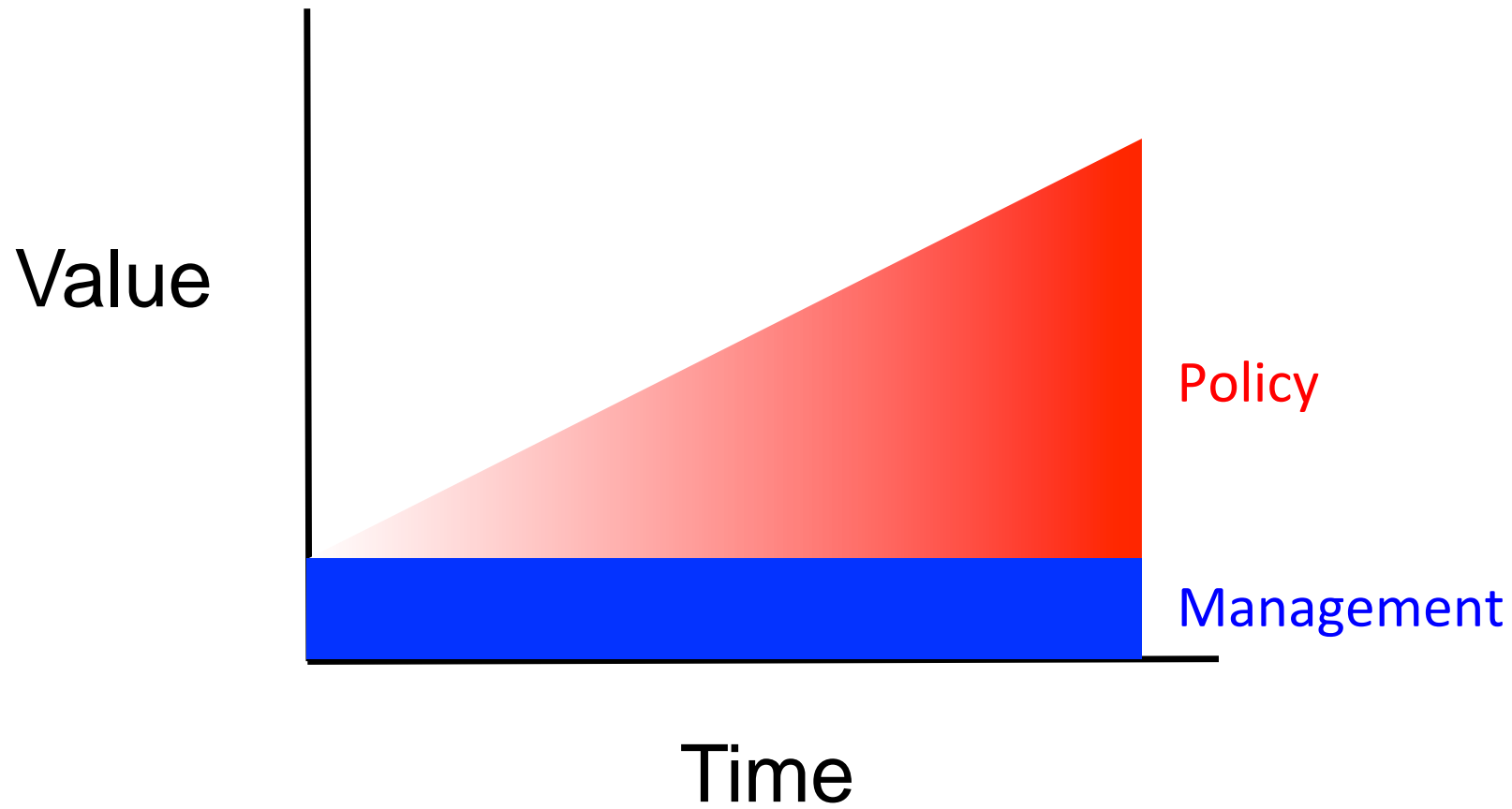
Value



Climate Change

Assessment

Time



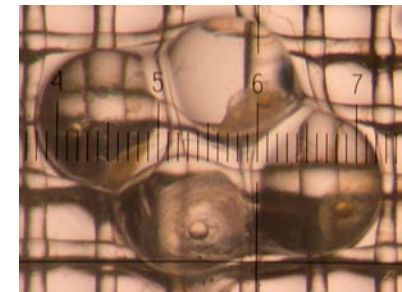
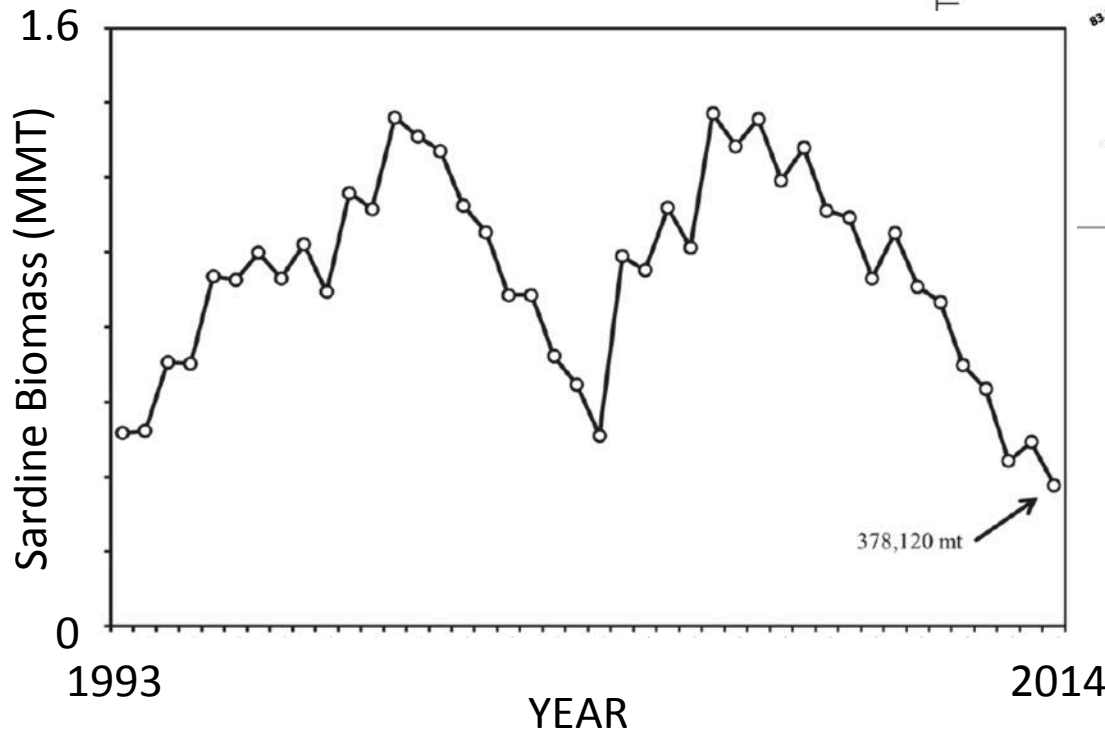
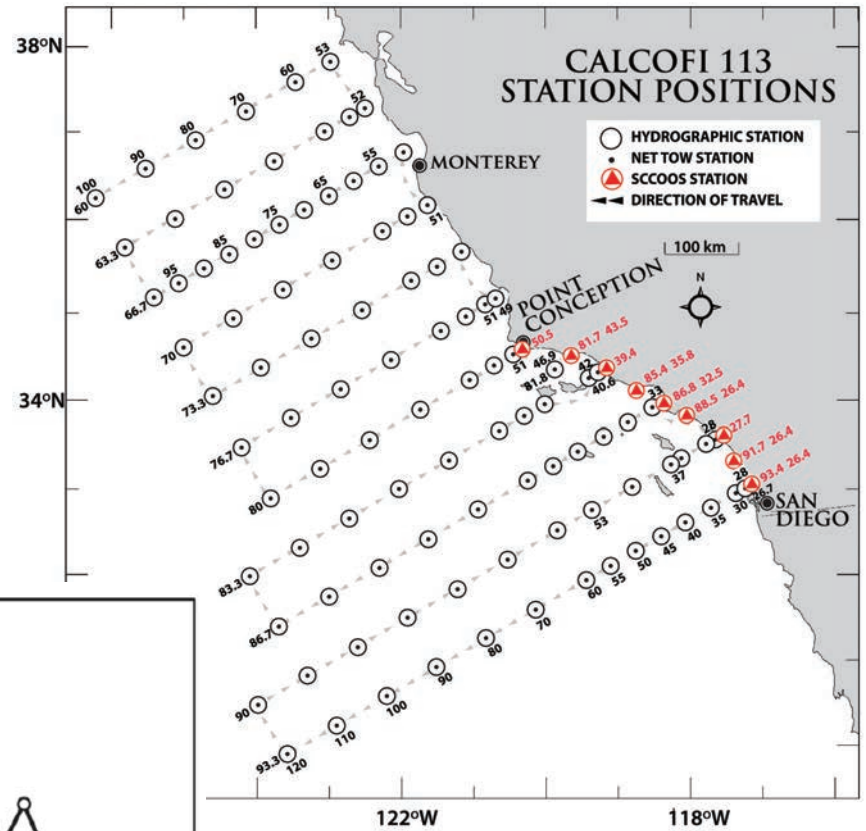
## *Examples of plankton time series used in making decisions in management and policy*

- 1 CalCOFI – assessment
- 2 CalCOFI – phenology and climate
- 3 Korea – long-term ecosystem change
- 4 South Africa – spatial management
- 5 South Africa – assessment and climate

1

# Sardine Assessment

Sardine egg abundance used in the Stock Synthesis Model

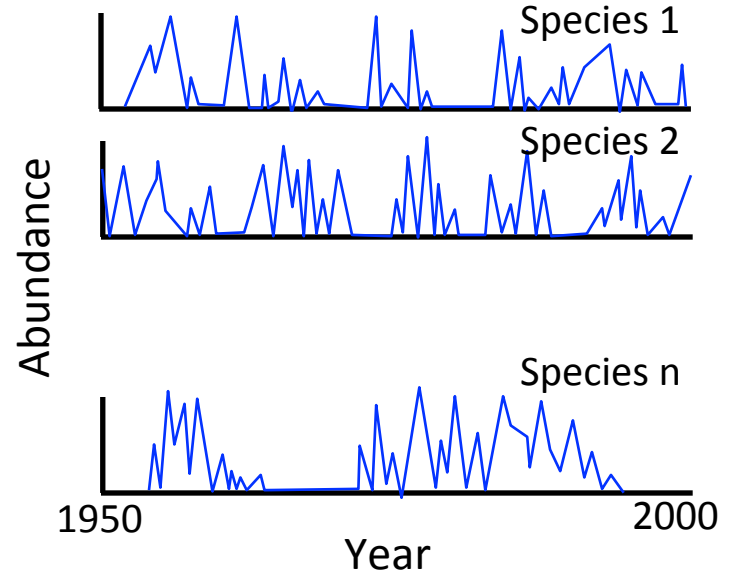
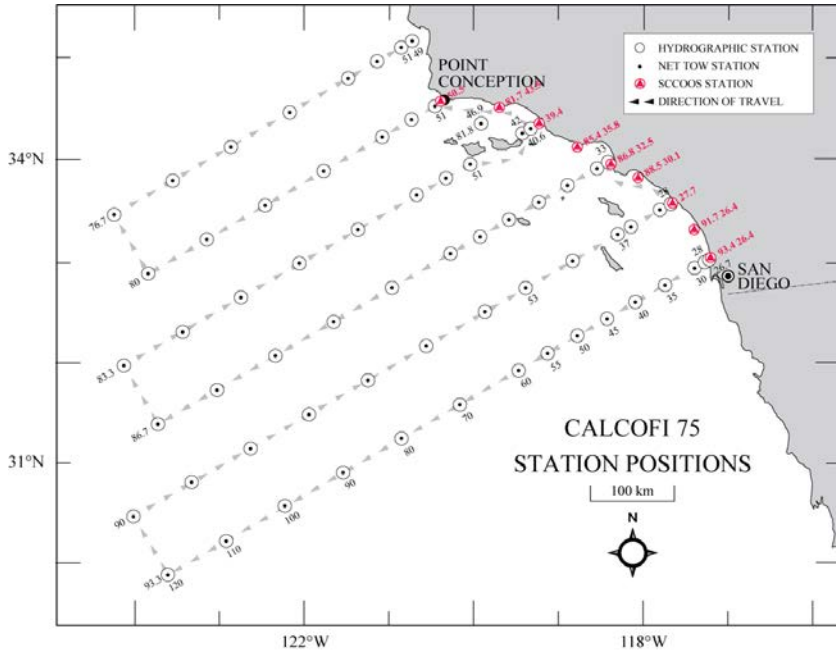


(Hill et al. 2013)

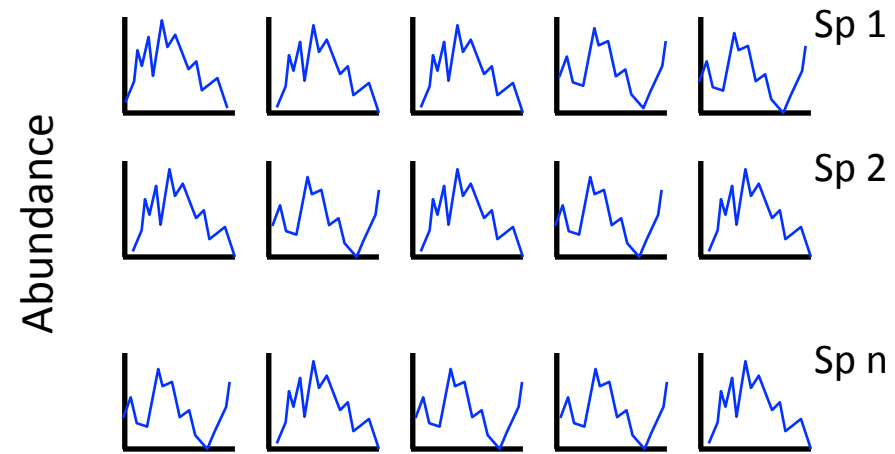
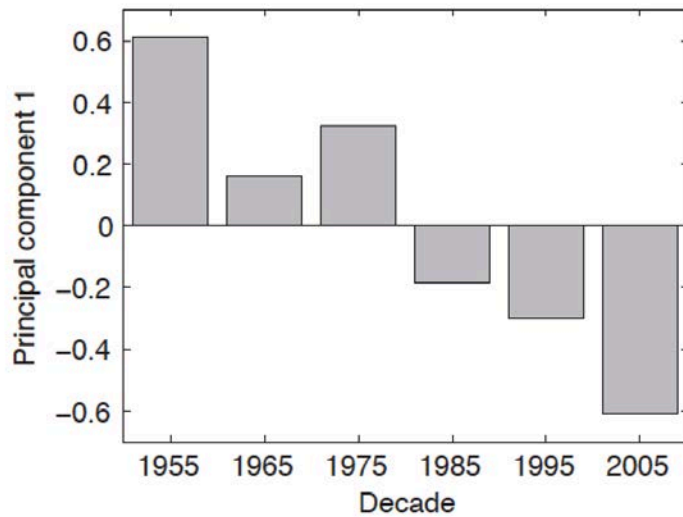


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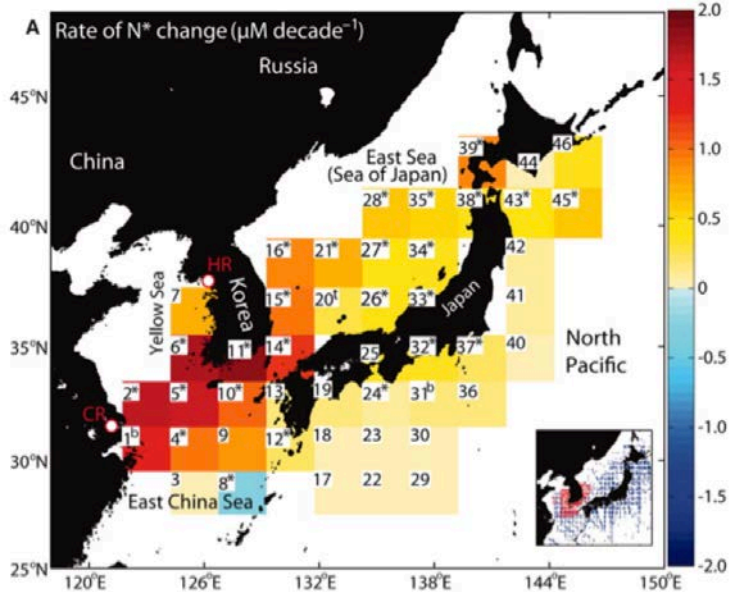
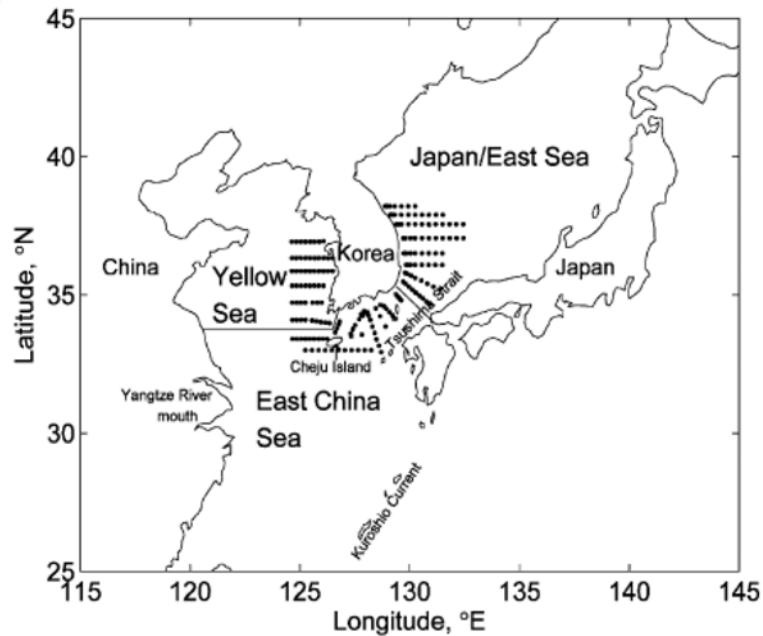
## Phenology and Climate Change



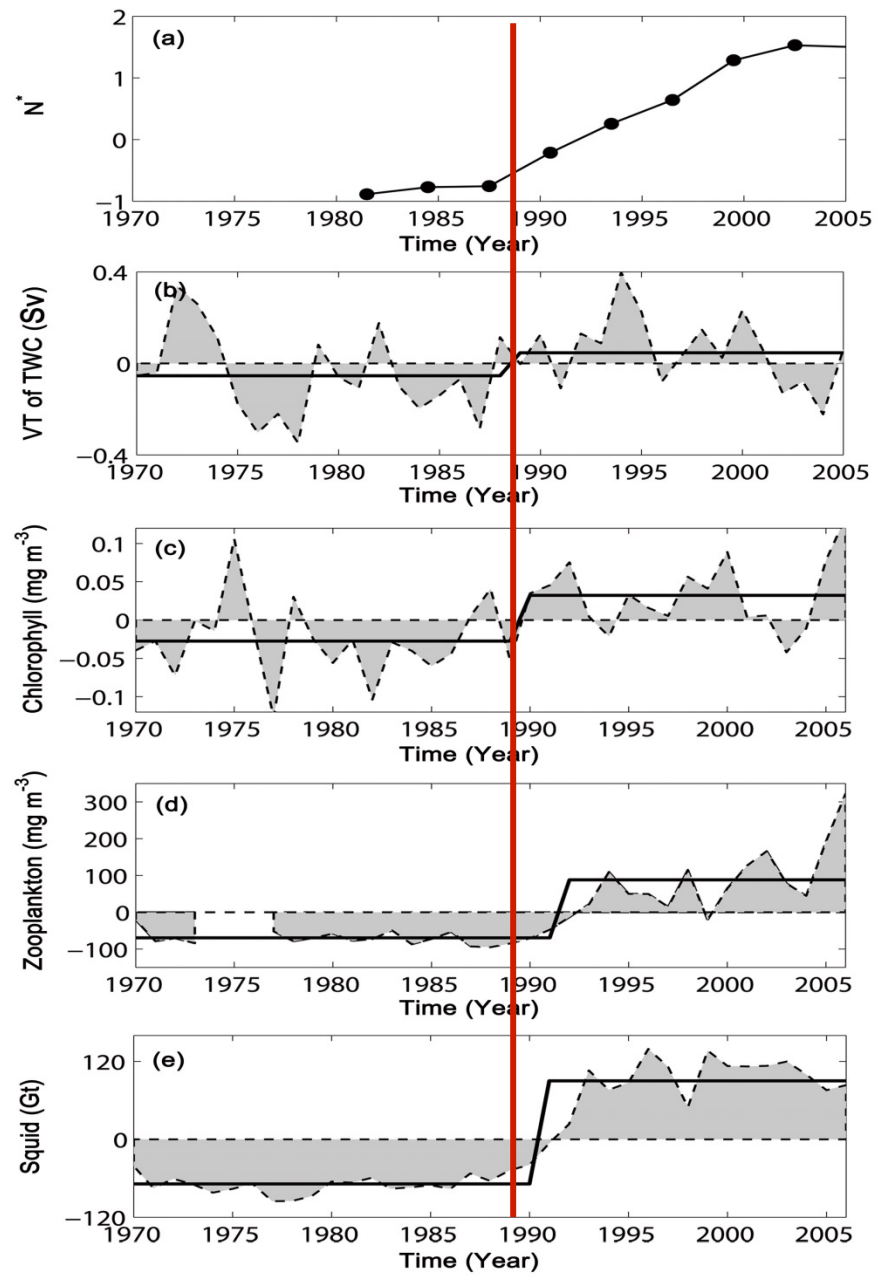
'50s   '60s   '70s   '80s   '90s



(Asch in prep.)



Kim et al. 2011)

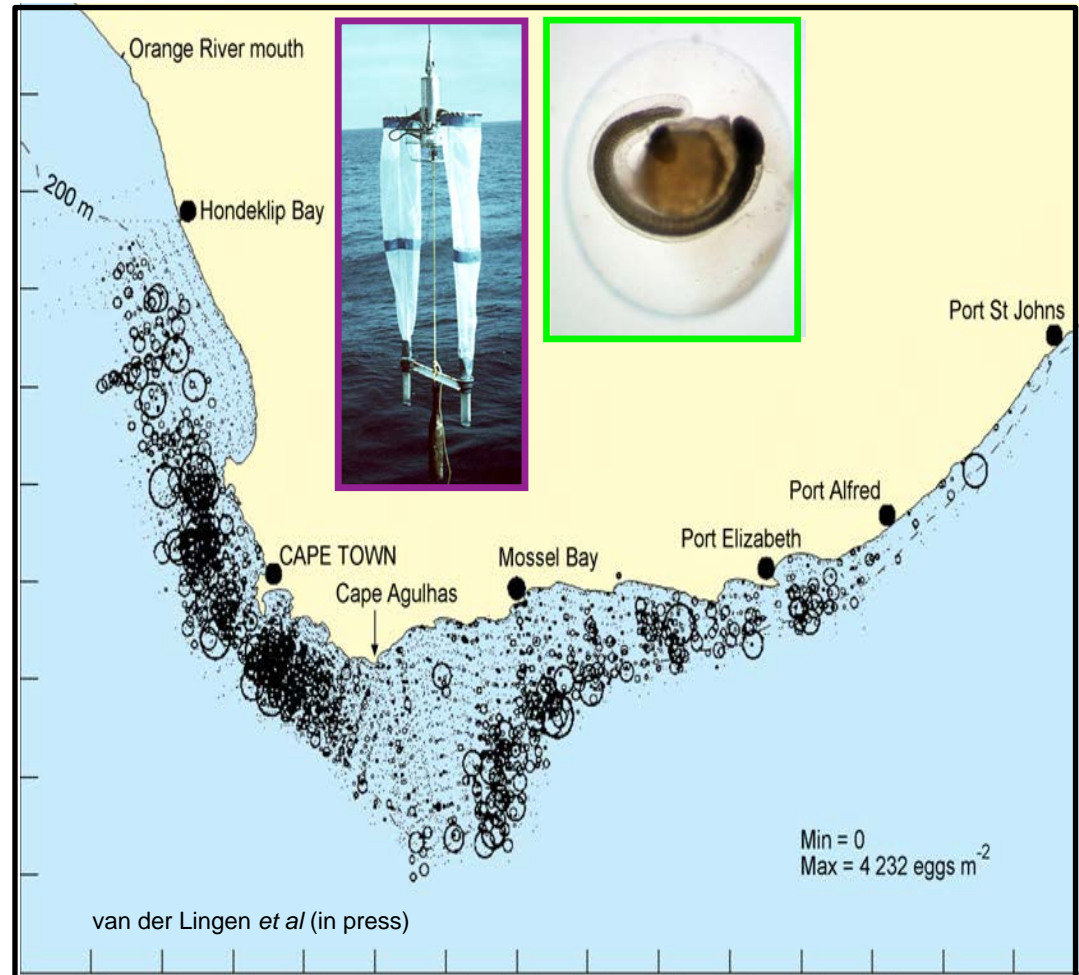


(From Sinjae Yoo, after Kim et al. 2011)

## 4

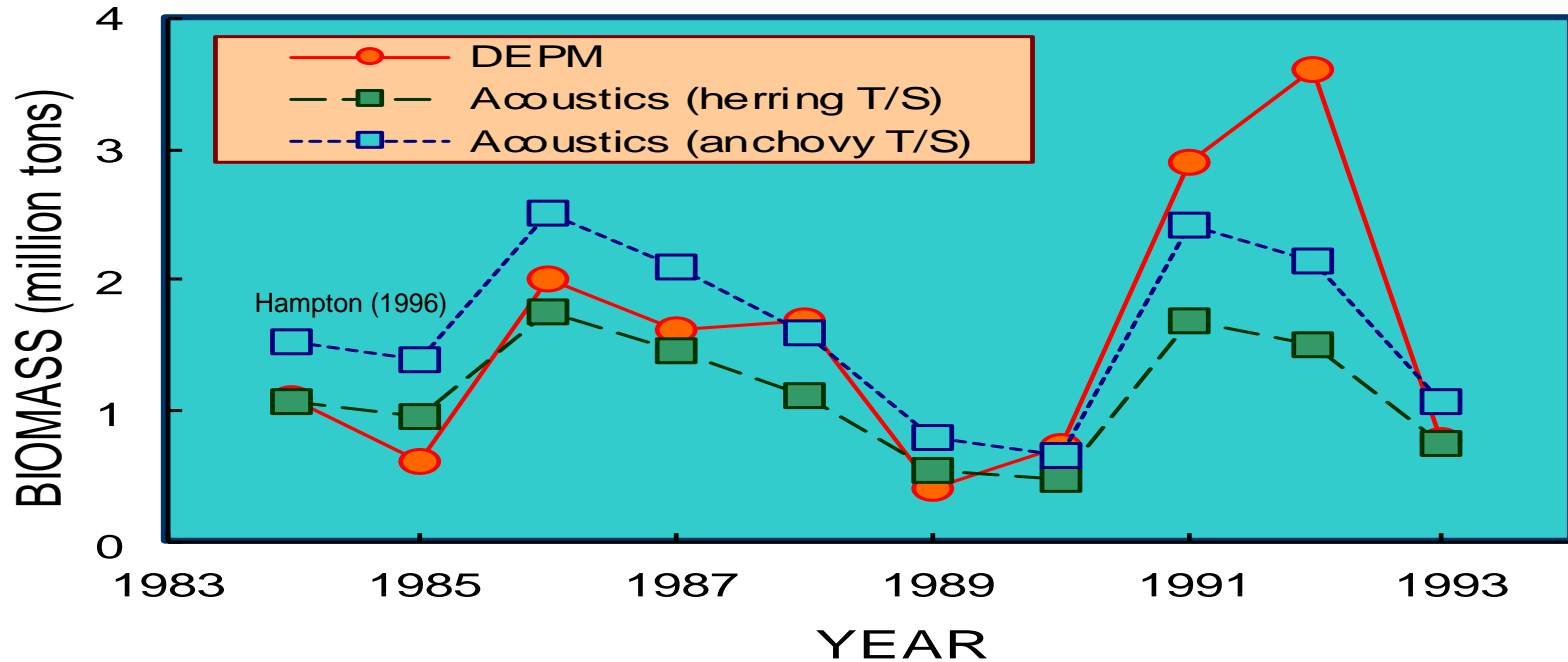
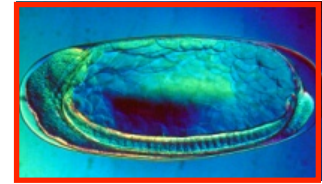
# South African Ichthyoplankton Surveys and Fisheries Management

- Ichthyoplankton samples (1986-2000)
- Two discrete sardine (*Sardinops sagax*) spawning areas (west and south coast)
- Multiple sardine stocks
- Stock-specific assessment models
- Spatial management.



(Carl van der Lingen)

# South African Ichthyoplankton Surveys and Fisheries Management



- Ichthyoplankton samples 1985-1993
- Daily Egg Production Method (DEPM) used to estimate adult biomass
- Used with anchovy acoustic target strength (TS) expression used to estimate anchovy biomass

(Carl van der Lingen)

# Potential solutions to Funding Problems

More efficient sample collection and processing

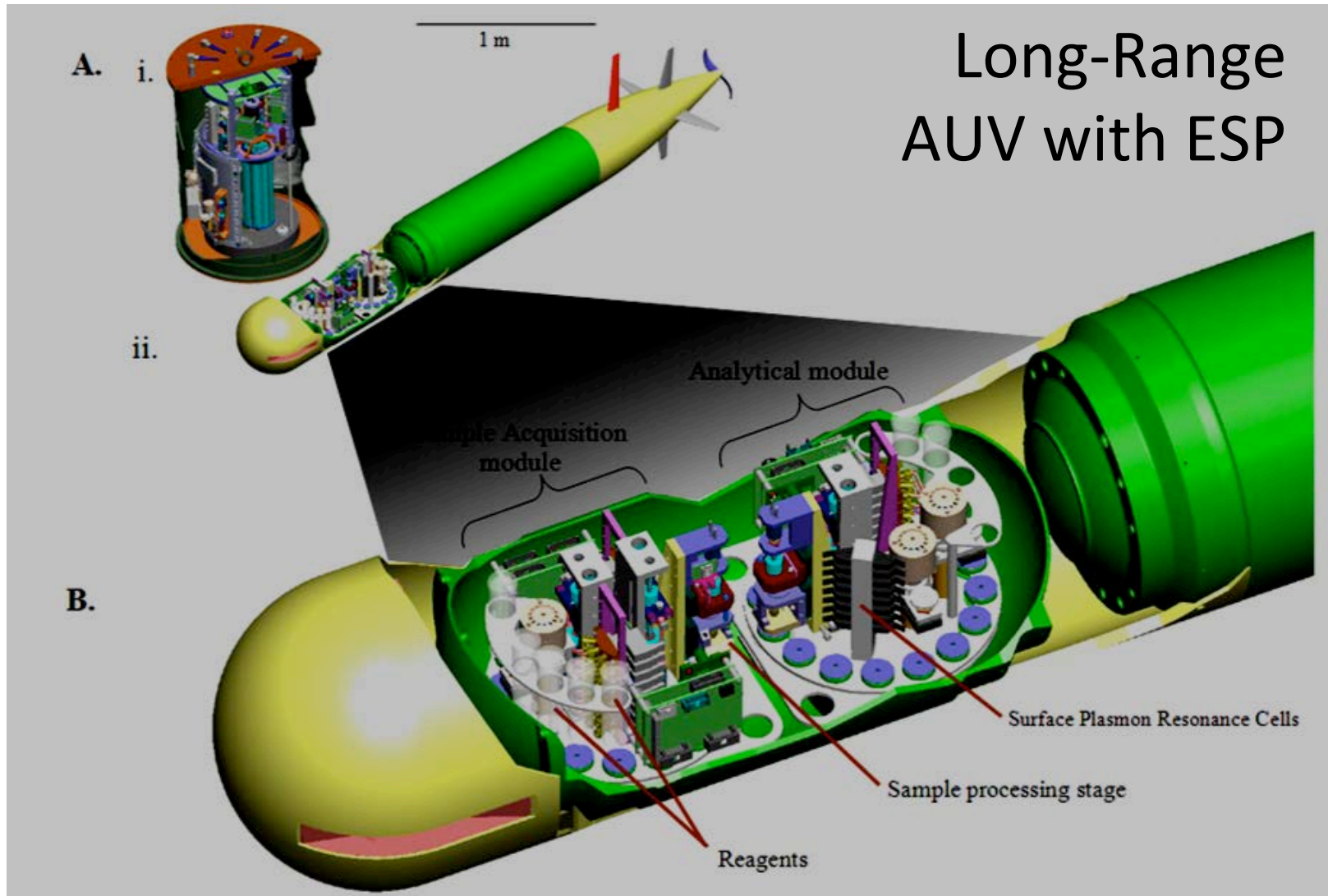
Maintain comparability of data

Increased funding

Increased mandates (e.g., Ecosystem Based Management)

Societal importance of climate change effects on the environment and biodiversity

# Autonomous Sample Collecting and Processing



(Chris Scholin and Jim Birch)



Climate change and the economy

June 28, 2014

# The cost of doing nothing

POLITICS

*The New York Times*

## *Environment Is Grabbing Big Role in Ads for Campaigns*

By CORAL DAVENPORT and ASHLEY PARKER OCT. 21, 2014

**INSURANCE  
JOURNAL**

## **Climate Change Report Slams Insurers for 'Profound Lack of Preparedness'**

By [Don Jergler](#) | October 22, 2014

# Conclusions

Plankton time series value increases with time

Flat budgets and increasing costs limit efforts

Solutions:

- Efficiency increase (advanced technologies)

- Increase funding

  - Government

  - Users

