MCCIP Marine Climate Change Impacts Partnership

Cefas

Climate Change and UK Fisheries – perceptions of risk and possible adaptation options

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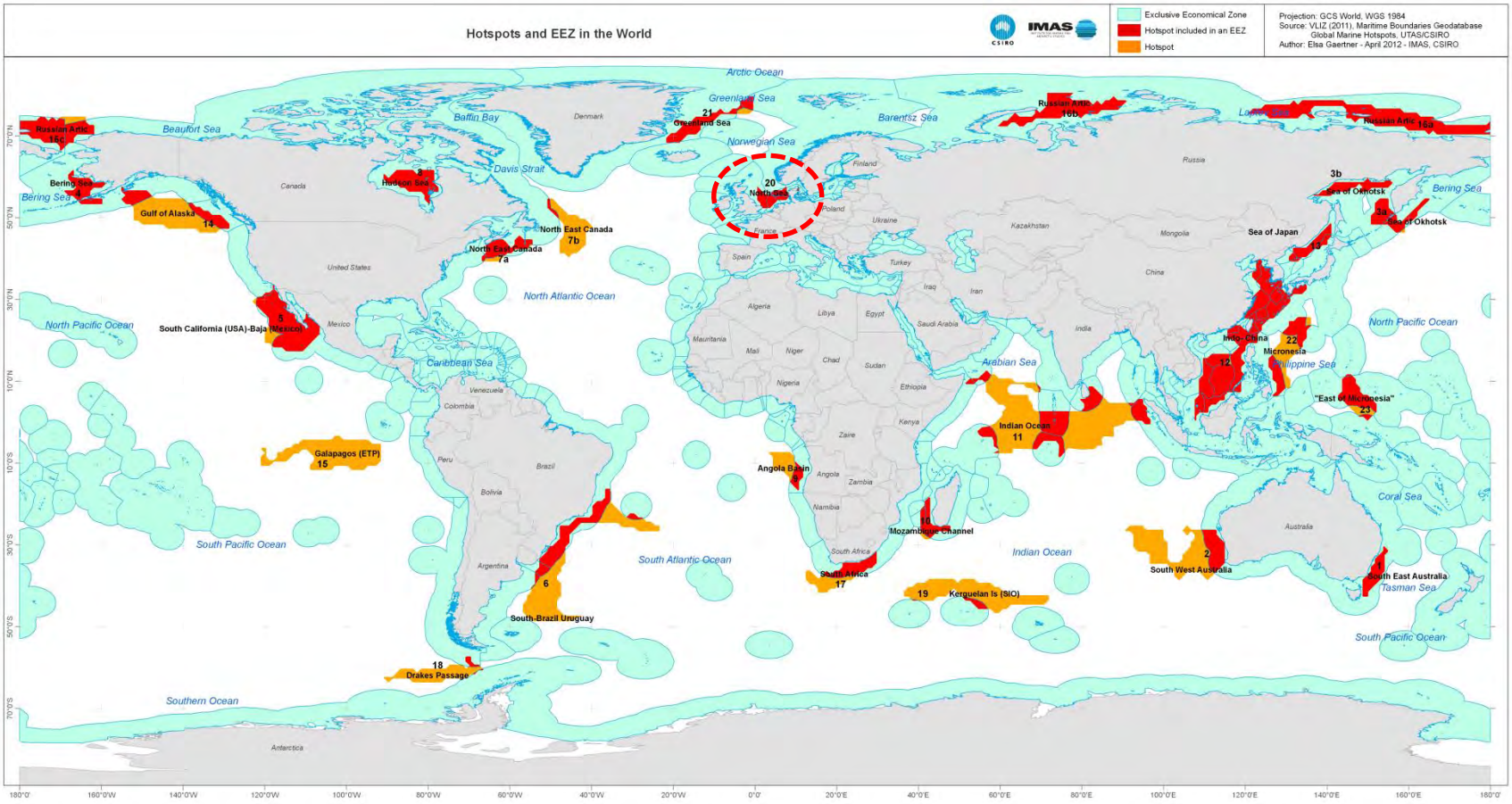
Session W5, Moving towards climate-ready fishery systems, Sun 22nd Mar 2015

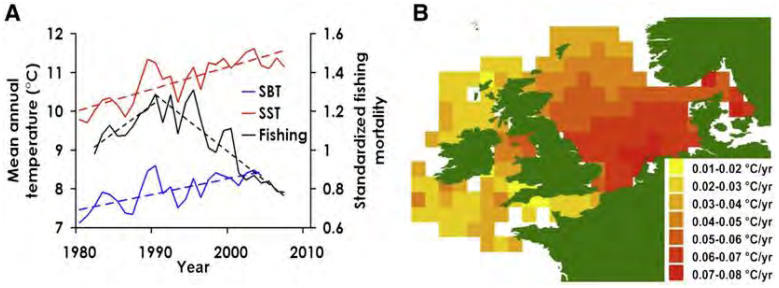
The North Sea – a 'hot spot' of climate change…..



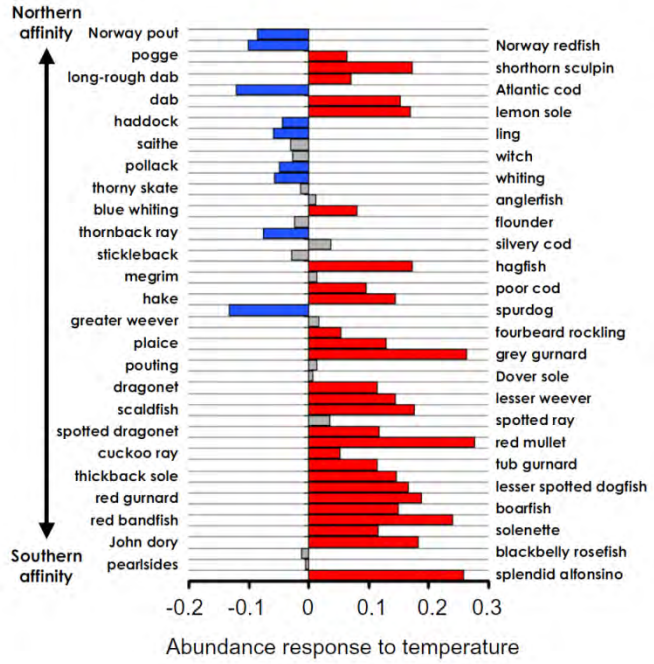
One of 20 sites identified by Hobday & Pecl (2013) as having warmed the fastest

Observed ‘northward’ distribution shifts

Temperature response



Winners & Losers



72% of the fish species have responded to warming by changing distribution and abundance (Simpson et al. 2011)

Centres of distribution have generally shifted by **distances ranging from 48 to 403 km** (Perry et al. 2005).

The North Sea demersal fish assemblage **deepened by ~3.6 m per decade** between 1980 and 2004 (Dulvy et al. 2008).

Catches (1913–2007) of cod, haddock, plaice and sole have all shifted distribution albeit **not in a consistent way** (Engelhard et al. 2011).

In the UK we have witnessed both **“winners”** and **“losers”**

The UK Climate Change Act (2008)

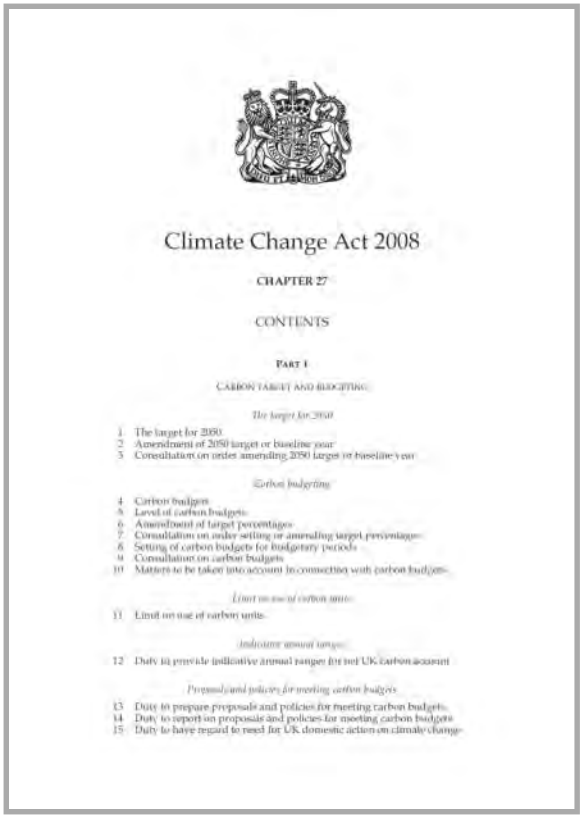
A legally binding long-term framework to cut carbon emissions.

It also created a framework for building the UK's ability to adapt to climate change, including:

1. **a UK wide climate change risk assessment** that must take place every five years

2. **a national adaptation programme** which must be put in place every five years to address the most pressing climate change risks to England

3. **Powers to direct "reporting authorities"** to prepare reports on how they are acting on the risks and opportunities from a changing climate.



Climate Change Act 2008

CHAPTER 27

CONTENTS

PART 1

CARBON TARGET AND BUDGETING

The target for 2050

1 The target for 2050
2 Amendment of 2050 target or baseline year
3 Consultation on order amending 2050 target or baseline year

Carbon budgeting

4 Carbon budgets
5 Level of carbon budgets
6 Amendment of target percentages
7 Consultation on order setting or amending target percentages
8 Setting of carbon budgets for budgetary periods
9 Consultation on carbon budgets
10 Matters to be taken into account in connection with carbon budgets

Limit on use of carbon units

11 Limit on use of carbon units

Indicative annual ranges

12 Duty to provide indicative annual ranges for net UK carbon account

Proposals and policies for meeting carbon budgets

13 Duty to prepare proposals and policies for meeting carbon budgets
14 Duty to report on proposals and policies for meeting carbon budgets
15 Duty to have regard to need for UK domestic action on climate change

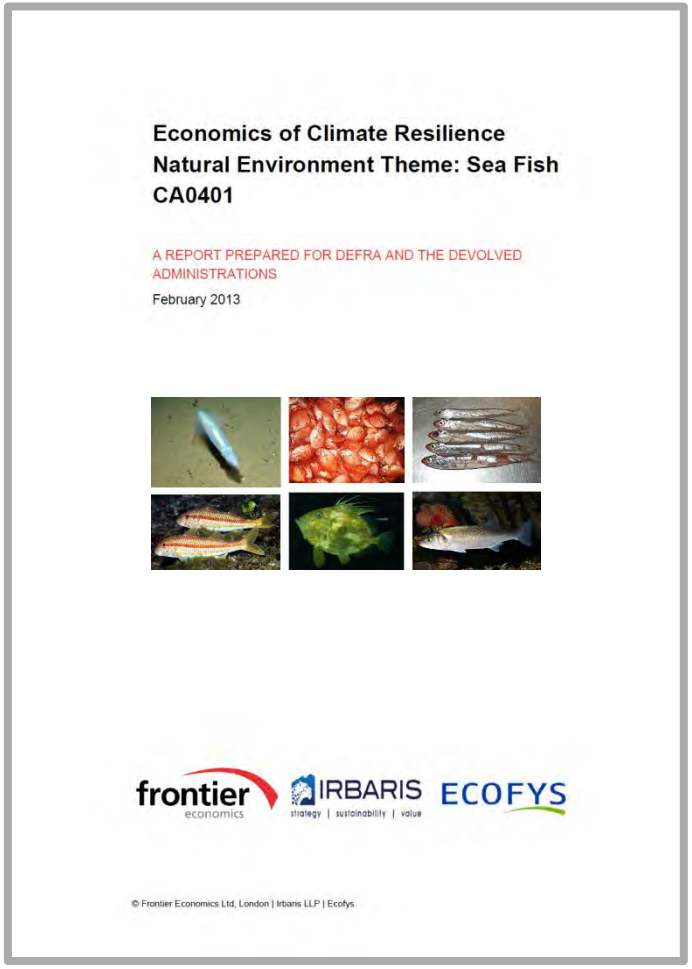
ECR (Economics of Climate Resilience)

This study included a detailed assessment of whether or not the UK fish catching sector can adapt to the opportunities (and threats) associated with future climate change.

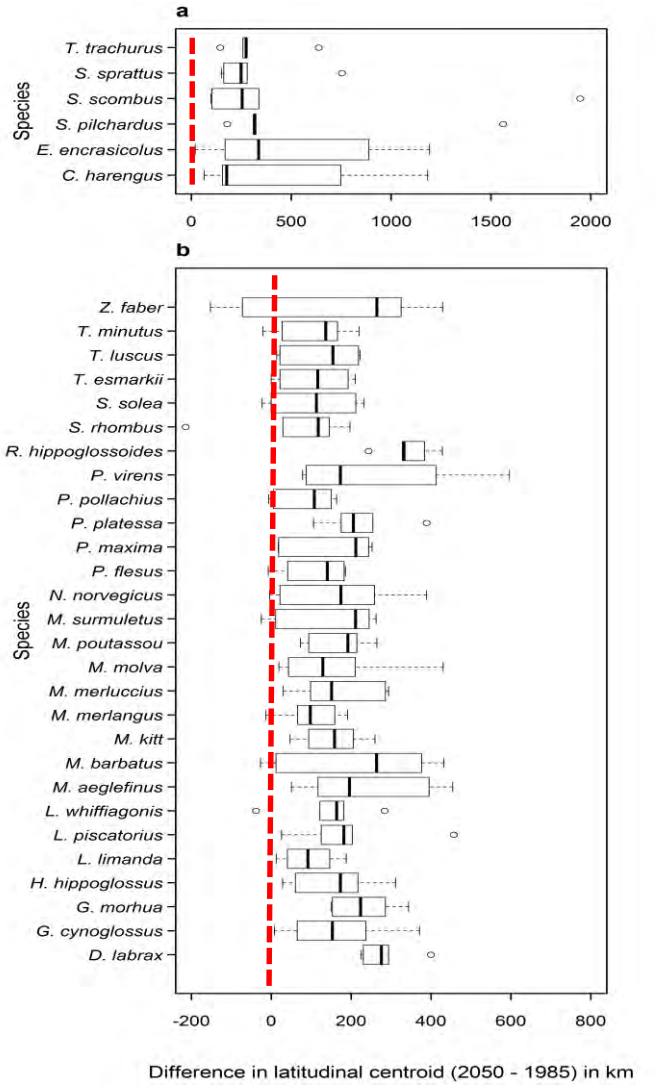
Used the analyses of Jones et al. (2012, 2013)

The ECR focussed on species increasing in the UK EEZ, such as anchovy, squid, seabass, scallops, boarfish, and hake.

"is there a case for further intervention to deliver effective adaptation given the current context"?



Projected changes in fish distribution…



Projected change (in km) in latitudinal centroids from 1985 to 2050 across species distribution models and climatic datasets for a) pelagic species and b) demeral species (from Defra 2013).

The ensemble projections suggested northward shifts at an average rate of 27 km per decade (the current rate is around 20km per decade for common fish in the North Sea, Dulvy et al. 2008).

The species predicted to move the furthest and fastest were squid, red mullet, seabass, anchovy and sardine

UK waters will become more hospitable for these species

(based on analyses by Miranda Jones)

Expanding fisheries in recent years……

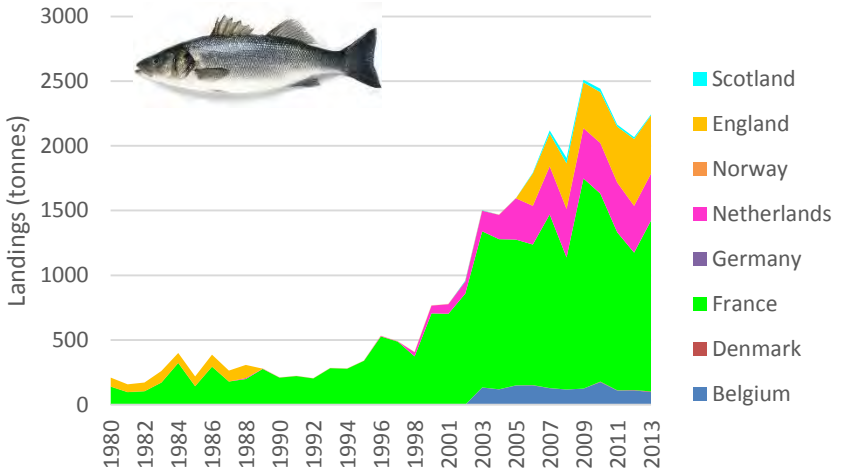





Emerging seabass & squid fisheries

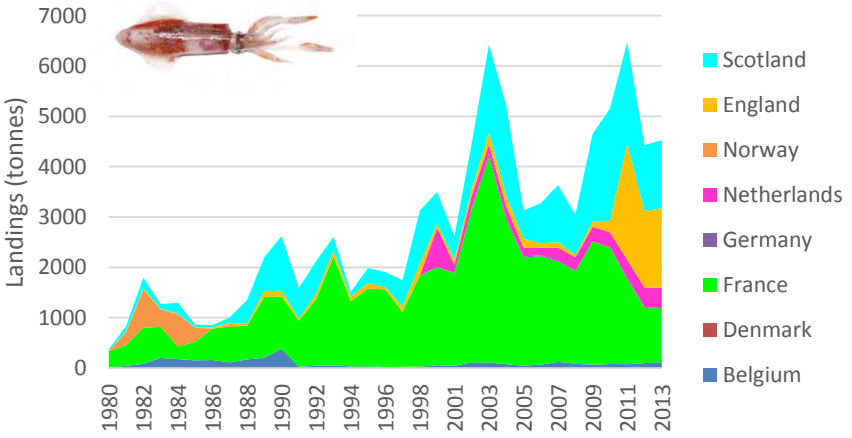
In 1984 only 210 tonnes of seabass were landed by countries surrounding the North Sea and English Channel, compared to 2243 tonnes in 2013

Recent evidence (ICES 2012) suggests that the increase may have slowed slightly over the past 3 years, as a result of successive cold winters with resulting poor recruitment



International landings of squid have risen from 375 tonnes in 1980 to 4527 tonnes in 2013

Off north-east Scotland, more boats are now trawling for squid than they do for the region's traditional target species, such as haddock and cod (Hastie et al., 2009)



ECR (Economics of Climate Resilience)

The key adaptation actions the UK fishing industry is likely to make include:

1. Travelling further to fish for current species, if stocks move away from UK ports.
2. Diversifying the livelihoods of port communities, this may include recreational fishing
3. Increasing vessel capacity if stocks of currently fished species increase.
4. Changing gear to fish for different species, if new or more profitable opportunities are available.
5. Developing routes to export markets to match the changes in catch supplied.
6. Stimulating domestic demand through joined up retailer and media campaigns.

Consumer tastes and preferences

Most of the fish we eat in the UK we import and most of the fish we catch we export.

There is clear maladaptation, in that consumers continue to demand 'traditional species' (e.g. cod) and we obtain these from countries further North (Iceland and Norway).

We sell the fish/shellfish we catch (e.g. *Nephrops* and mackerel) to countries further south who have a tradition of eating these species.

Hugh Fernley-Whittingstall (TV chef) promoting the 'mackerel bap' in 2012

In 2011 the supermarket Sainsbury's ran a campaign "switch the fish". This initiative challenged the supermarket's customers to try an "alternative" fin-fish species.

Sainsbury's reported an annual increase of sea bass sales of 57%

People also often chose sea bass when they eat out as it is seen as more exclusive than cod. However, it is not seen as an everyday food.

Recommended interventions

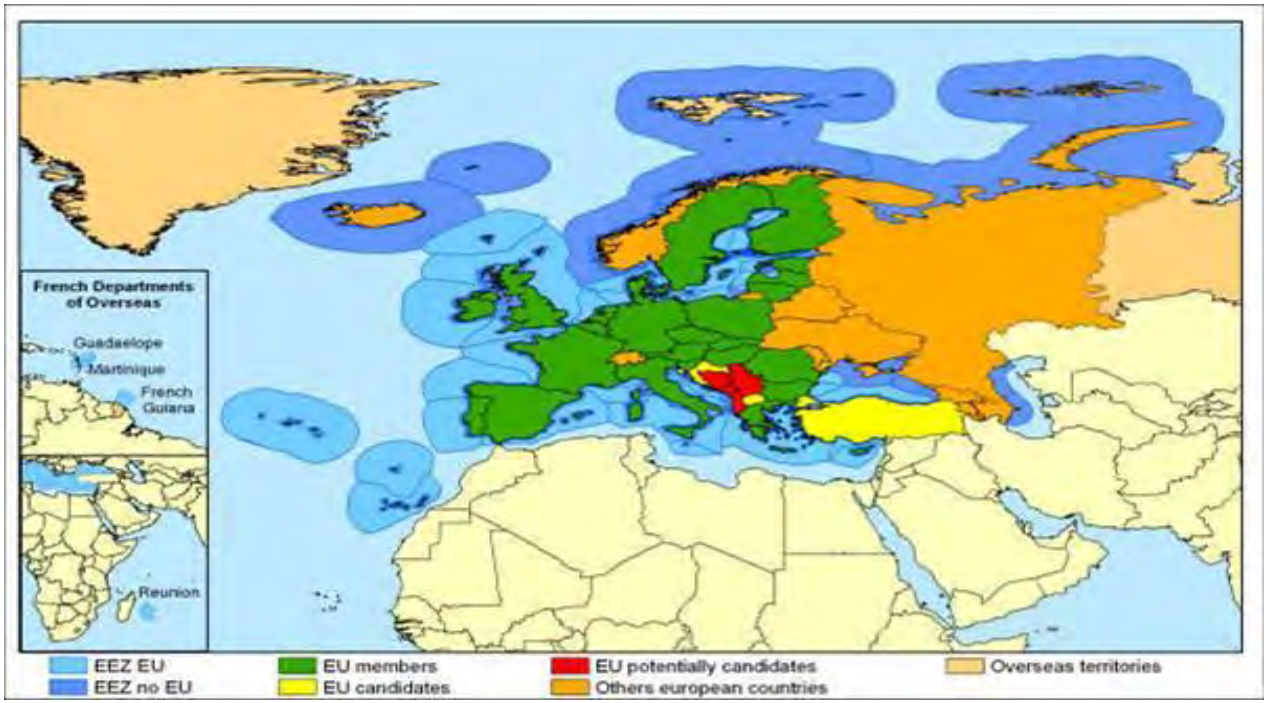
A. Enhance the capability to monitor new and more abundant species, involving collaborative working of fishing vessel operators with the scientific community.

B. Use appropriate existing communication channels to engage with vessel operators and embed learning in relation to best-practice fishing behaviours for new, or more abundant, species.

C. Examine methods to increase the flexibility with which vessels can adapt, for example by trading quota across operators of all sizes of vessel (large and small).

D. Proactively support the diversification of consumer demand through the provision of information to consumers about a wider range of fish species and through marketing.

The Challenge of managing across international borders...



- **27 countries** are part of the EU and are subject to the **EU Common Fisheries Policy (CFP)**
- Fisheries agreements also exist with **neighbouring countries** e.g. Norway, Iceland and Russia
- The CFP allows **common access** to all EU waters, but **quotas** are set according to **'relative stability'**
- **TACs vary each year but proportions allocated to each country are fixed in perpetuity!**

The current debate about North Atlantic Mackerel……

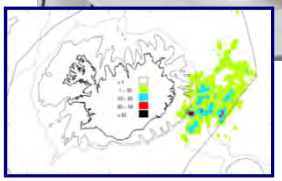
In 2011 Iceland and the Faeroe Islands claimed quota for mackerel (46%), since the species had suddenly attained high abundance in their territorial waters.

EU countries accusing Iceland and the Faeroe Islands of threatening stock sustainability.

There has also been a threatened retaliatory embargo on imports of all fish products from these countries

Such disagreements may become more common place in the future

(see talk by Leif Nøttestad, day 1)




FISHING NEWS
THE VOICE OF THE INDUSTRY SINCE 1913
Jubilee Quest launched at Whitby
EU CLOSES MACKEREL FISHERY TO NORWEGIANS
Norway's pelagic fleet exceeds its quota so stopped from fishing western mackerel in North Sea — report page 3


Mackerel battle hots up


Mackerel closure for Norwegian vessels in EU waters

Anchovy – who should be granted access?

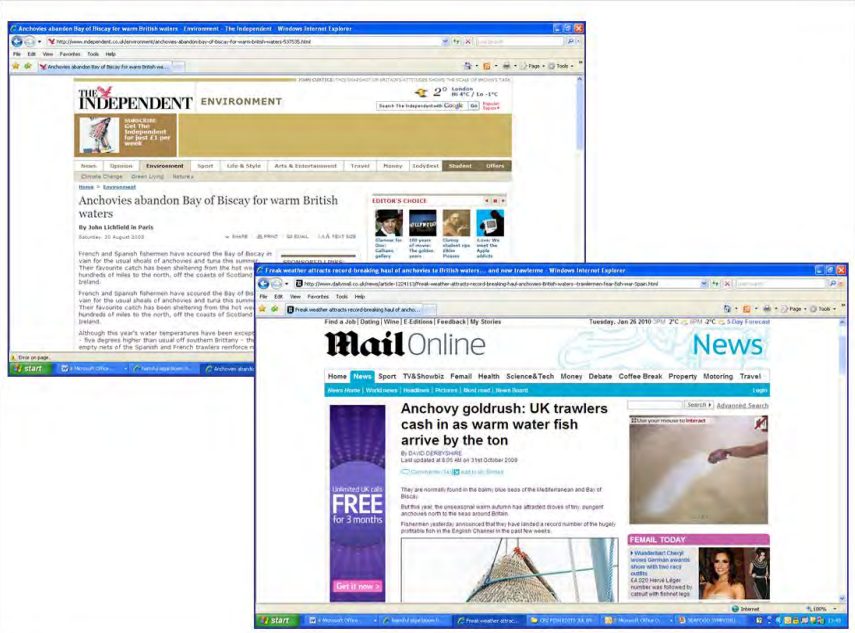
Anchovy stocks are depleted in the Bay of Biscay, but are increasing further north

Political negotiations are underway to determine whether Spanish and French vessels should be allowed to operate in areas where previously they had no quota.

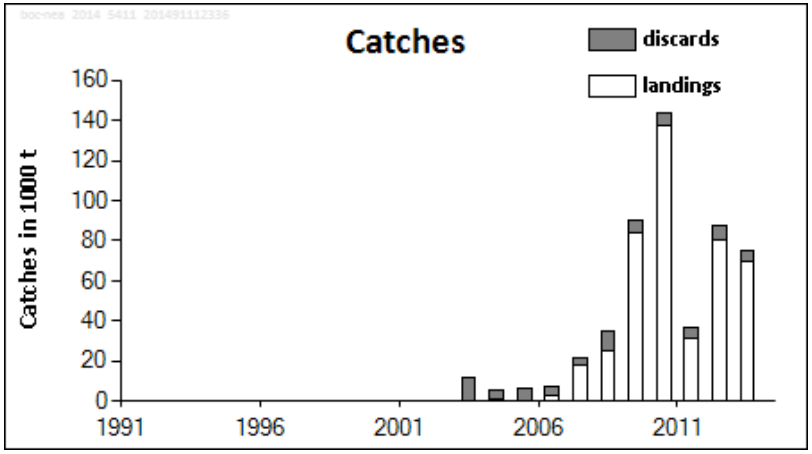
Petigas et al. (2012) carried out an analysis to determine *"is it the same anchovy or something different"?*

Concluded that these anchovy are a distinct remnant sub-stock rather than an invasion of animals from the south.

According to the rules, Spanish and French vessels have no 'track record' and so would not necessarily be granted access.



Boarfish – the race to develop 'track record'



Boarfish (*Capros aper)* appeared in very large numbers throughout the NE Atlantic in 1989/1990

In the past boarfish outbreaks had been linked to storms and variability in offshore climate (Cooper 1952).

Fishery landings have grown from <120 t in 2001, to >139 000 t in 2010.

The fishery has been described as an 'Olympic Fishery' as countries race to develop a track record

In 2012, Irish Ministers began negotiations with Chinese seafood companies with regard to exporting for human consumption

Industry perceptions about CC risk and exposure……

SEAFISH
the authority on seafood

Department for Environment Food & Rural Affairs

MCCIP Marine Climate Change Impacts Partnership

Aims to *"support the UK seafood industry to develop a managed adaptive approach to climate change"*

Comprised a literature review, substantive collaboration with the industry, 15 semi-structured interviews and 3 workshops

Considered all aspects of climate change (temperature, storminess, sea level rise, ocean acidification etc.)

Covered both domestic and international

Priority risks were identified in terms of: (1) confidence, (2) proximity, (3) severity, (4) possible adaptation actions

Some quotes…

"The governance systems we have are too rigid. Governance is not well placed to provide routes for the industry to adapt – it's adding to the problems"
Robert Stevenson - Fish Producers Organisation

"In the long term the processing sector needs to find new markets that will absorb the changing product"
Will Clark, Fish Merchants Association

"We're fortunate just now as there's a large share of valuable stock in UK waters. However if this were to change, then this would require changes to access rights if the fish shifted (back) to the Norwegian sector".
Ian Gatt – Pelagic Fishermen's Association

‘Choke species’…

In October 2014 the EU introduced a ban on discarding and thus a requirement to land all fish caught.

Once the least plentiful quota - the “choke species”—is exhausted, the whole fishery must cease operation

Hake, a warm-water species, has witnessed a dramatic increase in biomass between 2004 and 2011, and has recolonized the North Sea where it had largely been absent for over 50 years.

Low quota for hake in the North Sea will become a limiting factor, that may result in premature closure of the entire demersal mixed fishery

Baudron and Fernandez (in press)

Climate change is not just about temperature……

Projections of future storminess are very uncertain, but generally for the UK we expect more frequent, severe storms

During the winter of 2013/2014 strong storm events had devastating consequences for the inshore fishing industry.

Many vessels were tied up in port for more than 5 months, with implications for revenues, profits and local economies and damage to both onshore infrastructure and to the fishing vessels themselves.

The winter of 2013/14 was the stormiest in the last 66-years (Matthews et al. 2014)


BBC NEWS ENGLAND

Plymouth market closed as storms hit fishing

Plymouth Fish Market was closed on Monday because of a lack of fish from boats tied up in storms.

Related Stories


BBC NEWS CORNWALL

Storms send Newlyn fish prices rocketing

Fishermen who have been trapped on land as ferocious storms batter Cornwall's coast may risk sailing in dangerous conditions, a leading fishing organisation has warned.

Related Stories


BBC NEWS CORNWALL

Cornwall fishermen make plea over lost lobster pots

Fishermen in Cornwall are calling for help with the cost of replacing hundreds of crab and lobster pots missing or damaged in the storms.

Related Stories


BBC NEWS ENGLAND

Storm-hit fishing fleets 'facing financial crisis'

Relentless storms have left many fishermen facing desperate financial crisis, with some unable to work since Christmas, a charity has said.

Related Stories

Some Conclusions…

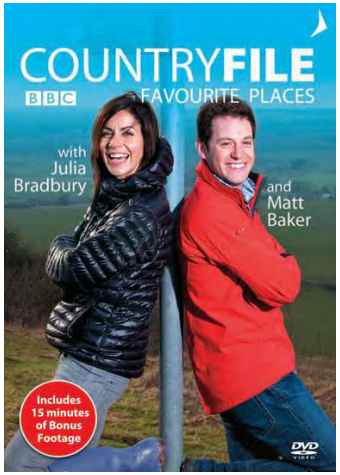
Table 7. Summary of organisational adaptive capacity

Fleet	Enablers to adaptation	Barriers to adaptation	Policy barriers	Overall capacity to adapt
In-shore	• Currently fish mixed species. • Low operating costs. • Supply niche markets in the UK (restaurants and local fishmongers). • Net replacements rates for investments.	• Cannot travel far. • Decisions can be dominated by short-term considerations. • Generally not represented by producer organisations (may be part of associations). • Many based in small ports where access to export markers can be an issue.	• Cannot trade quotas between themselves. • Threat of losing shellfish licence if change away from shellfish. • More easily displaced by MPZs.	Are versatile and opportunistic, yet restricted to opportunities that come to them.
Demersal and beam trawlers	• Currently fish mixed species. • Will need to have replaced nets within the next 20 years of species change. • May have more incentive to change if current fishing low profit species. • Fishing for species all year round.	• Northern fleets fishing cod have low profitability. • High operating and fuel costs restrict ability to travel further or invest in new gear. • Vessels only suitable for demersal species.	• Likely to fish in cod or sole areas, so face quota and effort restrictions.	Incentivised not to travel further for current species but will face strongest policy and capacity barriers to changing species.
Pelagic	• Profitable so likely to have investment finance options. • Fish seasonally, so may have off-season underutilised capacity. • Larger vessels and ability to travel further. • No time at sea restrictions. • Currently export a large amount of stock – not reliant on the UK market for demand. • Their supply chain also work seasonally so may have underutilised capacity.	• Tend to target one species at a time. • Pelagic species can move and change quickly.	• Typically profitable species, limited by quota allocations to the UK. • Large ships which need enough quota allocation to make the industry viable.	Currently the vessels are profitable so have capacity but lack incentive.

MCCIP Fish, Fisheries & Aquaculture Card 2012

In May 2012 MCCIP launched a ‘special topic’ report card on fish, fisheries and aquaculture

Lots of media coverage:



BBC Wildlife, August 2012

The Guardian, 9th May 2012

Scientific American, 2nd July 2012

Fin……

Acknowledgements:

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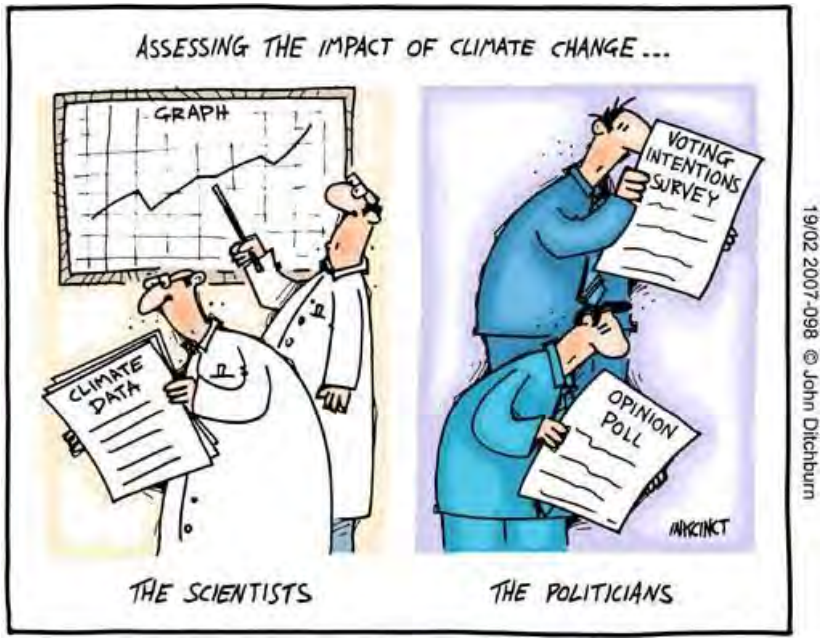

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