

Understanding and adapting to a changing climate for UK seafood

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Here to give the UK seafood sector
the support it needs to thrive.

Contents

1. Climate change and seafood
2. Approach in the UK
3. Aspects of our approach
4. Lessons and pointers
5. Looking ahead



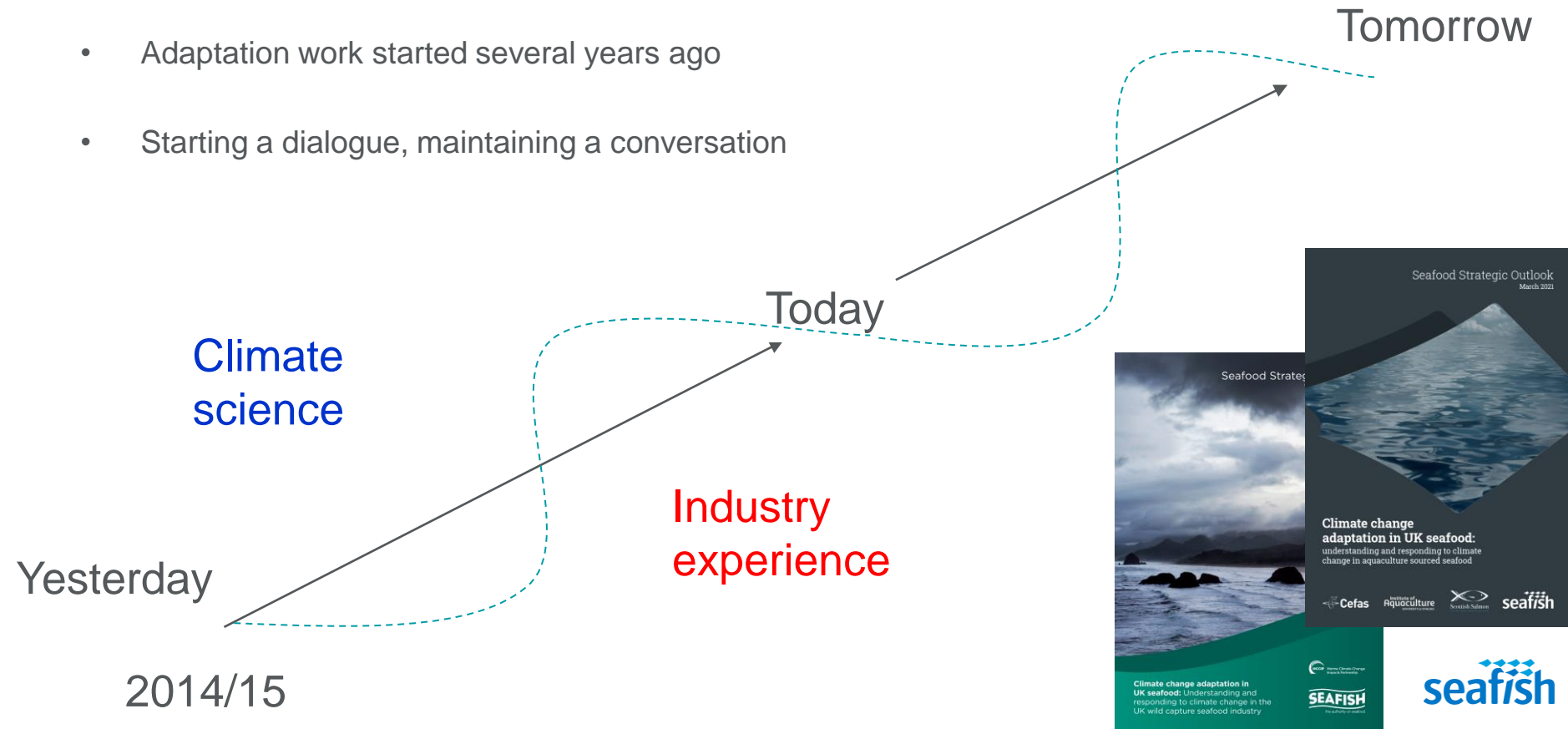
Climate change and seafood



- Global climate change recognised as a major challenge for the world, prompting a call for action.
- A warming climate must be addressed, but the world still needs to be fed.
- Food can be an easy target. However, seafood is a relatively low emissions food product.
- We believe seafood is the way forward, a changing climate is expected to disrupt this.

UK approach

- Adaptation work started several years ago
- Starting a dialogue, maintaining a conversation



UK approach - framing

- Understanding - *‘What does a warming world mean for our seafood systems?’* and
- Action - *‘What meaningful responses can support adaptation?’*
- Framing seafood: Whole seafood system / domestic and international supply chain

Stocks	Capture / production		Transport and distribution	Trading, processing, storing	Market / sales outlet	Consumption	Waste
Target species	Capture fleets	Landing ports and auctioning markets	Air, sea, and road freight	Primary and secondary processors, importers and exporters, traders	Retail Food Service Wholesale Feed suppliers	‘In-home’ and ‘out-of-home’ consumers	Under-utilised product at all stages

- Helping industry make sense of key changes and how they might respond (drawing on scientific expertise and industry experience)

UK approach - understanding key drivers

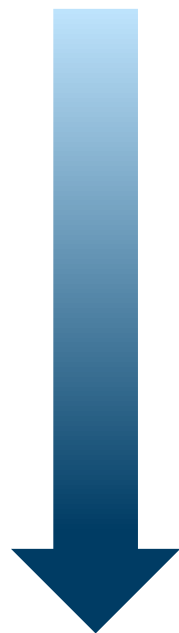
The key drivers of climate change relevant to seafood

- Severity of **storminess and waves**.
- Air and water **temperature change**.
- Changes in **terrestrial rainfall**.
- Sea level rise/extreme water levels.
- Ocean acidification (with some uncertainty).



UK approach - understanding range of impacts

The implications of these drivers - they may result in increased:



Now

- **Storminess and waves:** compromising vessel and crew safety, damaging ports and vessels
- **Temperatures:** affecting capture species distribution and could affect the range of farmed species

2040

- **Terrestrial rainfall:** such as flooding of land-based infrastructure, affecting water quality and salinity of nearshore waters

2070

- **Sea level/extreme water levels:** increasing the risk of coastal flooding
- **Ocean acidification:** affecting fish in low oxygen waters, shellfish ability to form shells

UK approach - prioritising impacts

OFFSHORE					
	Sea level rise, extreme water levels	Increased storminess and waves	Air or sea temperature change	Ocean acidification and deoxygenation	Changes in rainfall / run off
WHITEFISH					
a) Fishery resources					
i. Alterations in species phenology			●		
ii. Impacts on choke species (linked to landing obligations)			● ●		
iii. Changes to growth rate of target species			● ●		
iv. Changes to the distribution of target species			● ●		
v. Changes to year-class strength (including larval survival)			● ●		
vi. Migration patterns of target species (timing and routes)			● ●		
b) Offshore operations					
i. Staff physical working conditions		●			
ii. Gear deployment / performance		●			
iii. Damage to fleet		●			

UK approach - prioritising impacts

OFFSHORE					
	Sea level rise, extreme water levels	Increased storminess and waves	Air or sea temperature change	Ocean acidification and deoxygenation	Changes in rainfall / run off
PELAGIC					
<i>a) Fishery resources</i>					
i. Migration patterns of target species (timing and routes)			●		
ii. Alterations in species phenology			●		
iii. Changes to the catchability of target species		●	●		
iv. Changes to growth rate of target species			● ●		
v. Changes to the distribution of target species			● ●		
vi. Changes to year-class strength (including larval survival)			● ●		
<i>b) Offshore operations</i>					
i. Staff physical working conditions		●			
ii. Gear deployment / performance		●			

UK approach - prioritising impacts

OFFSHORE					
	Sea level rise, extreme water levels	Increased storminess and waves	Air or sea temperature change	Ocean acidification and deoxygenation	Changes in rainfall / run off
SHELLFISH					
<i>a) Fishery resources</i>					
i. Presence of HABs		●	●		●
ii. Presence of pests and diseases					●
iii. Changes to year-class strength (including spatfall)			● ●		
iv. Presence of non-natives / jellyfish			● ●		
v. Changes to the distribution of target species (including squid)			●		
vi. Changes to growth rates of target species			● ●		
<i>b) Offshore operations</i>					
i. Staff physical working conditions		●			
ii. Gear deployment / performance		●			
iii. Damage to fleet		●			

UK approach - prioritising impacts

OFFSHORE					
	Sea level rise, extreme water levels	Increased storminess and waves	Air or sea temperature change	Ocean acidification and deoxygenation	Changes in rainfall / run off
ONSHORE					
<i>a) Ports and harbours</i>					
i. Damage to site infrastructure	●	●			●
ii. Boat damage in ports / harbours		●			
iii. Integrity of electricity supply					●
<i>b) Employment and fishing communities</i>					
i. Integrity of housing and local amenities	●	●			
ii. Days at sea		●			
<i>c) Transportation of catch</i>					
i. Disruption to ferry service		●			
<i>d) Processing of catch</i>					
i. Damage to site infrastructure	●	●			●
ii. Integrity of electricity supply					●

UK approach – impacts with consequences

Temperature change:

- ..changes in the abundance and distribution of commercial fish stocks so **influencing catch potential** with implications for **quota management**:

Storminess/waves, changes in rainfall, sea level rise:

- ..dangerous **working conditions**, damage to **property**, disruption to **transport**.



UK approach: areas of adaptation, now & longer term*

- Fishery:
 - Enhancing fisheries science
 - Flexibility in fisheries management regimes (changing/new fisheries)*
- Fleet operations
 - Enhance operational safety
 - Review vulnerability of fleet*
- Onshore
 - Building port resilience
 - Assessing transport vulnerability
 - Develop seafood marketing strategies/organisations
 - Review need for relocation*
- Adaptation principles:
 - industry demand-led actions; maintain 'watching brief'; integrate into corporate planning

UK approach: examples of adaptation actions

- Storminess/waves:
 - Improved vessel design and operating practices e.g. crew enclosures and covered areas, pelagic vessels pumping from stern rather than side
 - Investment in port infrastructure e.g. defence against storm surges
 - Preparing for potential flood events e.g. contingency planning for worse case scenarios
- Temperature change:
 - Investment in fisheries research e.g. understand how temperature affects fish, fishing practices and prospects for the UK fleet

Lessons and pointers

Climate change and adaptation is not straightforward:

- Climate impacts are uncertain
- These uncertain problems compete with other, immediate challenges
- Adapting relies on working with others

Lessons and pointers

Climate change and adaptation is not straightforward:

- Role of institutional drivers
- Cross boundaries:
 - Consider the whole system and engage early with stakeholders.
 - Taking climate change into industry conversations (not the other way around)
- This is about the real world:
 - Climate change often amplifies existing concerns
 - Drivers for action are wider than climate change
- Adaptation framework rather than centralised plan.



Looking forward



- Seafood is the way forward
- Part of the solution helping to address climate change and food security
- We all play a part in seafood, and all have a part in responding to climate impacts
- We should be prepared:
 - Keep an eye on climate change
 - Working together to respond to changes we see coming
- Join us in this conversation
www.seafish.org/climate-change-seafood

Thank you



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