

# Climate Change in the Scottish policy landscape

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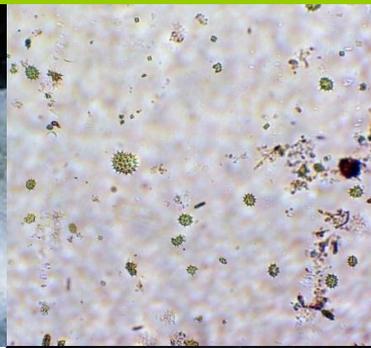
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**marinescotland**  Scottish Government gov.scot

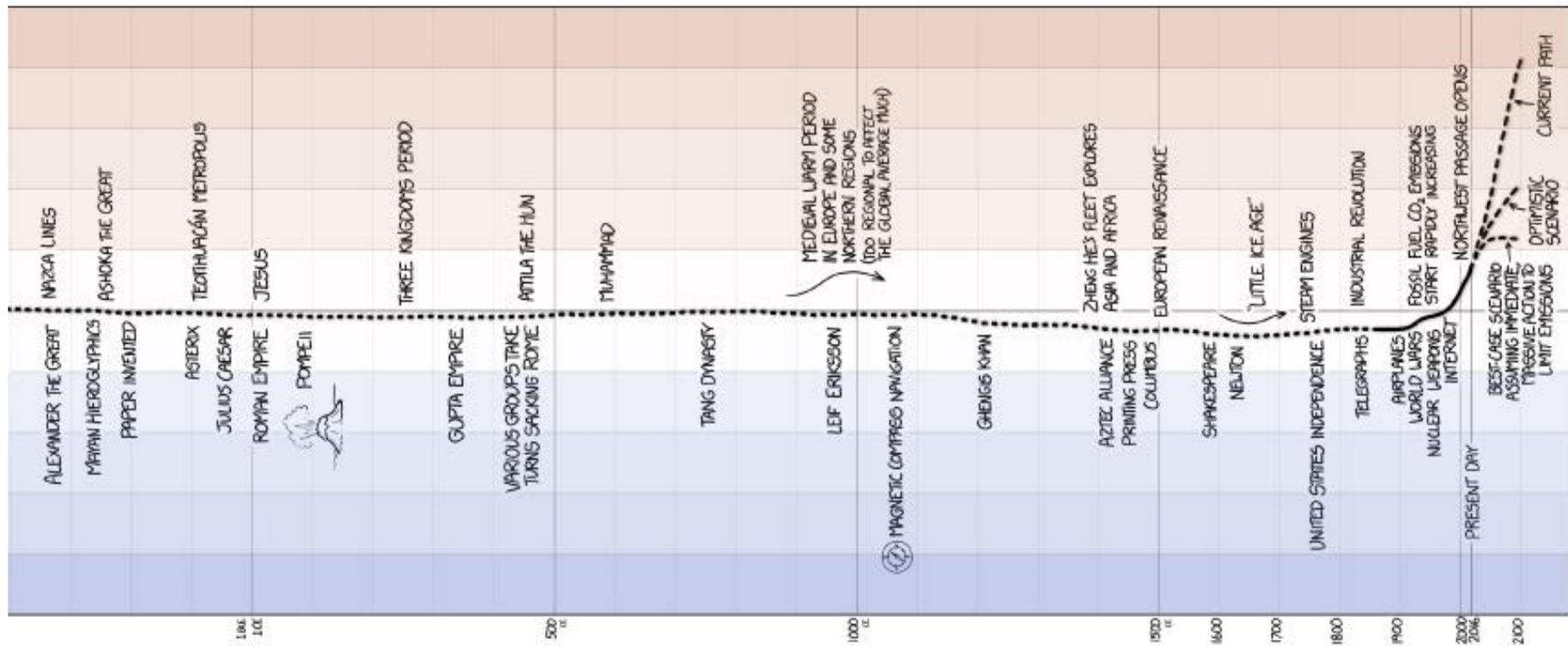
- Part of Scottish Government that is responsible for the integrated management of Scotland's seas
- Manage Scotland's seas for prosperity and environmental sustainability; by:
  - Policy, planning and licensing of activities
  - Enforcement
  - Scientific research, monitoring and advice



**marinescotland**  
science



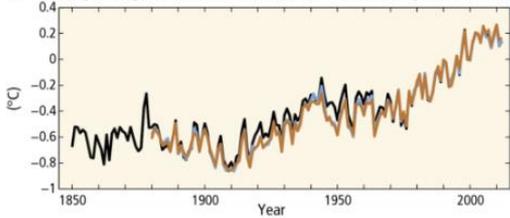
# Are we changing the Earth's climate?



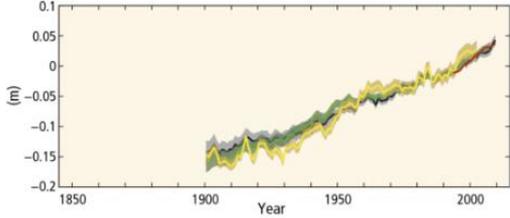
# Scientific Evidence of Anthropogenic Climate Change

## The Greenhouse Gas Effect

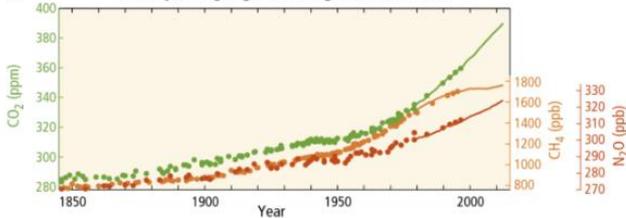
(a) Globally averaged combined land and ocean surface temperature anomaly



(b) Globally averaged sea level change

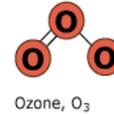
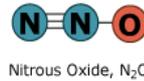
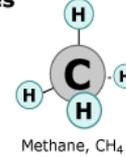
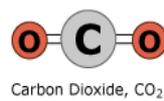
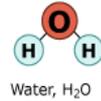


(c) Globally averaged greenhouse gas concentrations



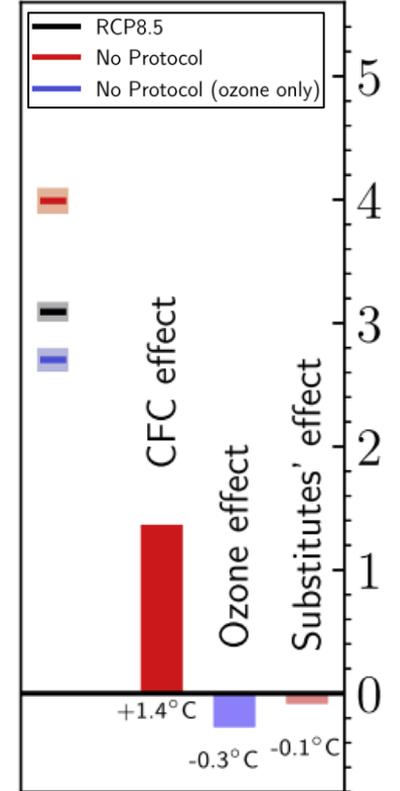
AR5 Synthesis Report (2014)

### Greenhouse Gases

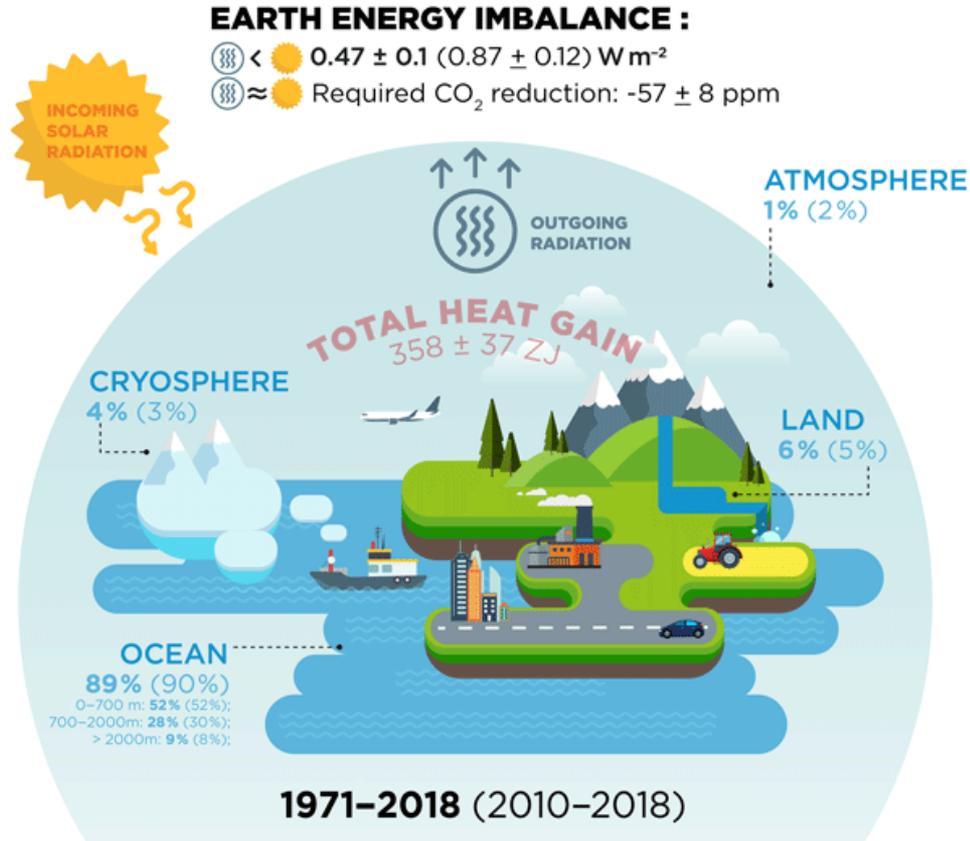


### Carbon Connections

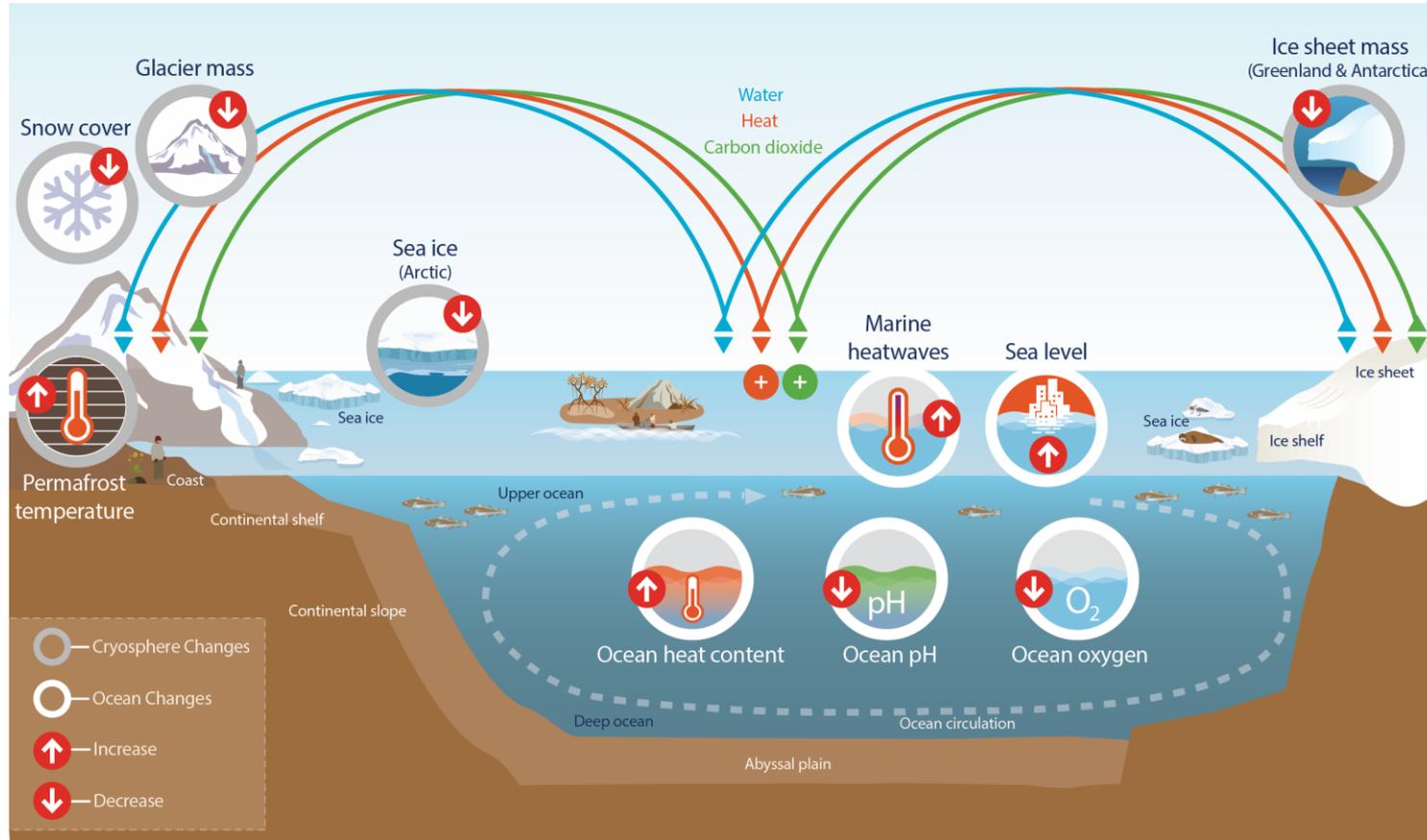
Substance	AR5 (2013)
Carbon dioxide, fossil (CO <sub>2</sub> )	1
Methane, fossil (CH <sub>4</sub> )	28
Methane, biogenic (CH <sub>4</sub> )	25.25
Dinitrogen monoxide (N <sub>2</sub> O)	265
HCFC-141b	782
HFC-134a	1300
HCFC-22	1760
HCFC-142b	1980
CFC-11	4660
CFC-12	10200
Sulfur hexafluoride	23500



# The Earth's Energy Imbalance



# Global Impacts of Climate Change on the Ocean and Cryosphere



SROC (2019)

# Climate Change in Scottish Government's Policies

## CLIMATE READY SCOTLAND: Second Scottish Climate Change Adaptation Programme 2019-2024

September 2019



Scottish Government  
Riaghthas na h-Alba  
gov.scot

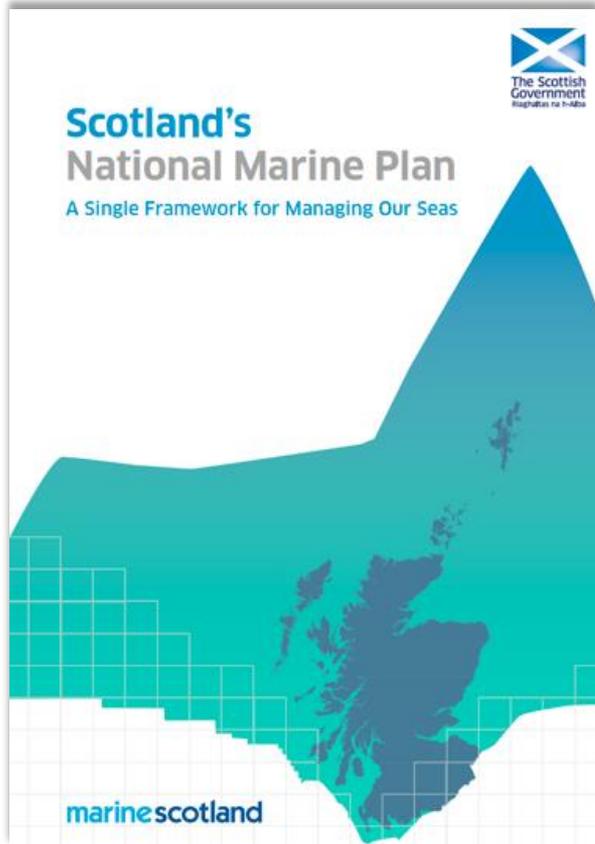
## CLIMATE CHANGE PLAN The Third Report on Proposals and Policies 2018-2032

February 2018



Scottish Government  
Riaghthas na h-Alba  
gov.scot

# Climate Change in Marine Policy

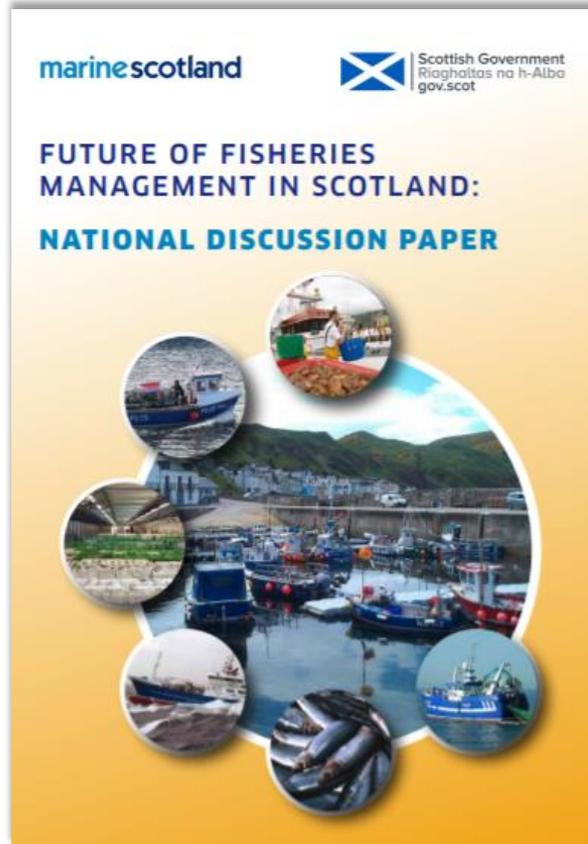


The cover features a teal map of Scotland with a white grid overlay. The title is in blue and grey, and the subtitle is in grey. The Scottish Government logo is in the top right, and the marine.scotland logo is in the bottom left.

**Scotland's National Marine Plan**  
A Single Framework for Managing Our Seas

The Scottish Government  
Riaghaidh na h-Alba

marine.scotland

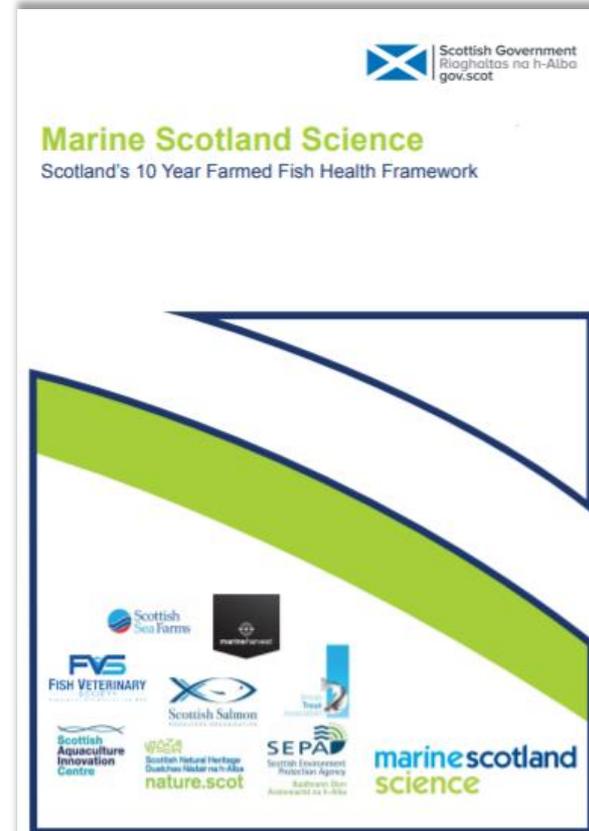


The cover has a yellow-to-orange gradient background. It features a central circular collage of images related to fishing and aquaculture. The title is in blue, and the marine.scotland logo is in the top left. The Scottish Government logo is in the top right.

marine.scotland

Scottish Government  
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**FUTURE OF FISHERIES MANAGEMENT IN SCOTLAND:  
NATIONAL DISCUSSION PAPER**



The cover has a white background with a large green and blue graphic element on the right side. It features several logos at the bottom, including Scottish Sea Farms, FVS, Scottish Salmon, Scottish Aquaculture Innovation Centre, Nature Scotland, and SEPA. The title is in green and blue, and the Scottish Government logo is in the top right. The marine.scotland science logo is in the bottom right.

marine.scotland science

Scottish Government  
Riaghaidh na h-Alba  
gov.scot

**Marine Scotland Science**  
Scotland's 10 Year Farmed Fish Health Framework

Scottish Sea Farms

FVS  
FISH VETERINARY

Scottish Salmon

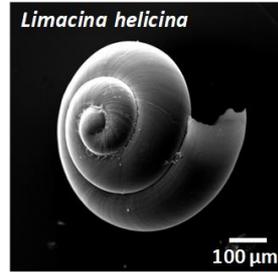
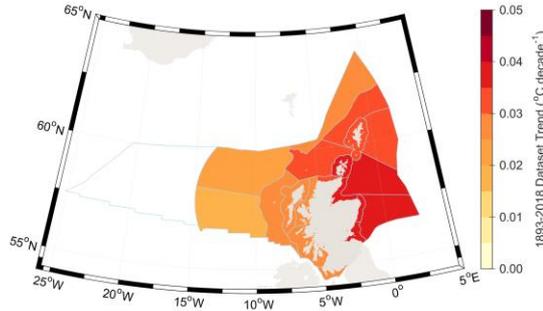
Scottish Aquaculture Innovation Centre

Nature Scotland

SEPA  
Scottish Environment Protection Agency

marine.scotland science

# Providing the evidence base to support policy making



# SCACS

## Scottish Centre for Aquatic Climate Change Studies

- To coordinate climate change science funded by the Scottish Government in the marine and freshwater environment
- To translate research outputs relating to climate change in the aquatic environment to policy makers and others.
- To create stronger links between Scottish Government and academia for aquatic research addressing climate change impact, monitoring, mitigation and adaptation.

## Climate change & Decommissioning

Marine Scotland Science's role in decommissioning:

- We provide advice to OPRED\* and operators on the potential impacts of decommissioning to the environment and fisheries
- We advise on alignment of decommissioning programme with Scotland's National Marine Plan
- We direct and deliver research to support decommissioning

How is climate change going to alter our advice, and the way that decommissioning options are selected by the operator/regulator?

What are the research priorities/knowledge gaps in relation to climate change, decommissioning and Scot Gov targets/commitments?



## Where are the impacts of Climate Change currently considered in the Decommissioning Process?

- **Waste management and reuse**
  - ❖ Comparative assessment process
  - ❖ Environmental appraisal
- **Emissions and energy use**
  - ❖ Comparative assessment process
  - ❖ Environmental appraisal
- **Alignment with Scotland's National Marine Plan**
  - ❖ Environmental appraisal

3A Leave (Major) Disconnect & Trench Entire Line	<p>Vessel Emissions (in tonnes):-            Fuel:- 2,834            CO2e:- 9,291            NOx:- 167.23            SO2:- 34.01            Vessel Energy Use:- 121,882 GJ</p> <p>The quantity of atmospheric emissions relates to the total fuel usage expected for the operations. The total estimated fuel usage required for this option would only represent a very small proportion of the total annual emissions from industry with respect to contribution to climate change. The impact of atmospheric emissions is therefore anticipated to be low.</p>
5A. Full Removal – Reverse Reel	<p>Vessel Emissions (in tonnes):-            Fuel:- 1,579            CO2e:- 5,175            NOx:- 93.14            SO2:- 18.94            Vessel Energy Use:- 67,885 GJ</p> <p>The quantity of atmospheric emissions relates to the total fuel usage expected for the operations. The total estimated fuel usage required for this option would only represent a very small proportion of the total annual emissions from industry with respect to contribution to climate change. The impact of atmospheric emissions is therefore anticipated to be low.</p>

## Examples of addressing NMP policies in decommissioning programmes

### GEN 5 – Climate change

Marine planners and decision makers **must act** in the way **best** calculated to **mitigate, and adapt to, climate change**.

Marine planners [...] should seek to facilitate a **transition to a low carbon economy**. They should consider ways to **reduce emissions** of carbon and other greenhouse gasses.

“

*[OPERATOR] will ensure that any potential impacts associated with [FIELD] decommissioning operations will be kept to a minimum.*

”

“

*Atmospheric emissions are not considered to present a significant environmental impact, therefore contributions to climate change are considered to be effectively managed*

”

“

*Emissions and energy use were considered in the selection of decommissioning option through the comparative assessment process. The selected option had the lowest emissions.*

”

## Examples of how emissions are considered in decommissioning environmental impact assessments

*“The estimated CO2 emissions generated by the selected decommissioning options is 21,667 te, this equates to less than **0.2% of the total UKCS emissions in 2018 (13,200,000 te; OGUK, 2019)**. Considering the above, **atmospheric emissions do not warrant further assessment**”.*

*“The total CO2 emissions from the [FIELD] decommissioning activities are estimated to be approximately 3502 tonnes, which will contribute approximately 0.014% of the atmospheric emissions associated with UK offshore shipping and oil and gas activities. The emissions from the project will thus likely have a **limited cumulative effect in the context of the release of GHGs into the environment and their contribution to global climate change.**”*

*“Emissions from short-term decommissioning activities are **small compared to those previously arising from the asset over its operational life**”*

*“On the basis that the **atmosphere has the capacity to accept the emissions without change**, the receptor sensitivity is ranked as Low. Combining these rankings, the impact significance is defined as **Negligible**”*

*“Emissions during decommissioning activities is occurring in the context of the cessation of production [...] Reviewing historical European Union (EU) Emissions Trading Scheme data and comparing with Comparative Assessment study suggests that emissions are likely to be **small relative to those during production**”.*

*“A review of previous decommissioning Environmental Statements shows that atmospheric emissions are exclusively concluded to have **no significant impact**, and are usually extremely small in the context of UKCS/global emissions”*

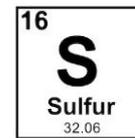
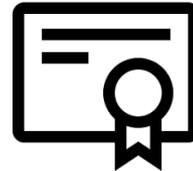
# Examples of how emission impacts are considered in decommissioning programmes

“The following procedures will be in place to ensure the impacts are minimised:

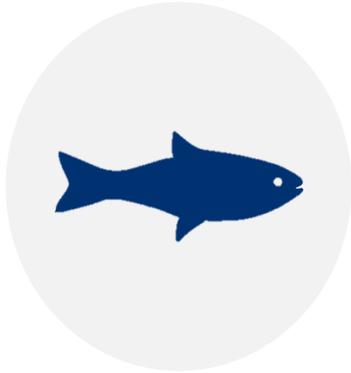
- Use of **low sulphur diesel**;
- Planned operations to **reduce vessel numbers** and the duration of operations;
- All combustion equipment subject to regular monitoring and inspections to ensure all combustion equipment runs as efficiently as possible;
- All vessels have the **appropriate UK Air Pollution Prevention** or International Air Pollution Prevention certificates in place as required;
- **Onshore facilities** have appropriate management procedures in place to ensure that atmospheric emissions, including those from movement, storage, treatment and disposal of materials, are below levels that could affect local air quality”

“Mitigation measures to minimise atmospheric emissions and energy consumption are detailed below

- All generators and engines will be maintained and operated to the manufacturers’ standards to ensure **maximum efficiency**.
- Vessels will use **ultra-low sulphur** fuel in line with MARPOL requirements.
- Work programmes will be planned to **optimise vessel time** in the field.
- Fuel consumption will be minimised by operational practices and power management systems for engines, generators and other combustion plant and maintenance systems.
- All mitigation measures will be incorporated into **contractual documents of subcontractors**”



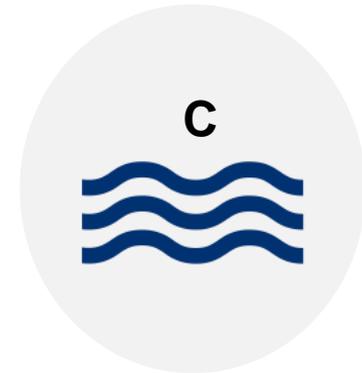
Where might we see the consideration of Climate Change & Net Zero become important in the Decommissioning process?



Fisheries



Technology

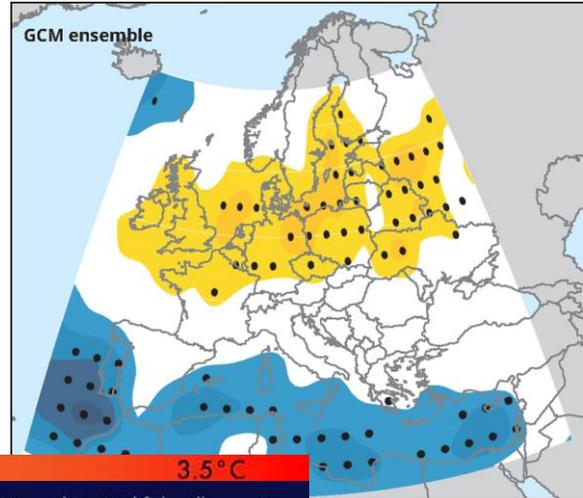
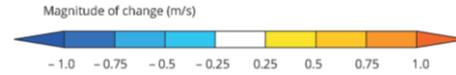


Blue Carbon

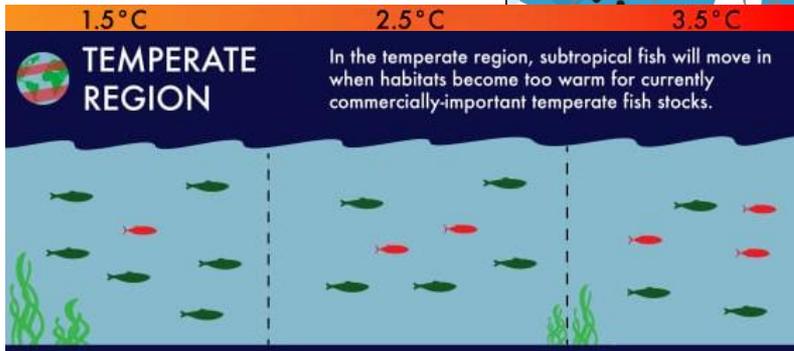


# Considerations of fisheries impacts & interactions

Projected changes in extreme wind speed.



Fish distributions will shift in response to ocean temperature



- *The impacts on fisheries and fishing activity, both historical and **future potential** will be of **paramount importance***
- *Details of interaction between any part of the pipelines and other users of the sea (e.g. in particular fishing activity, both historical and depending on the field it may be necessary to **estimate future activity**)*

OPRED BEIS Decom Guidelines (2018)

## Evidence-base on future fisheries patterns is currently lacking

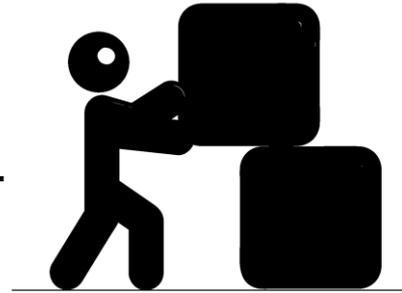


## Technology solutions for selected decommissioning option



Single lift

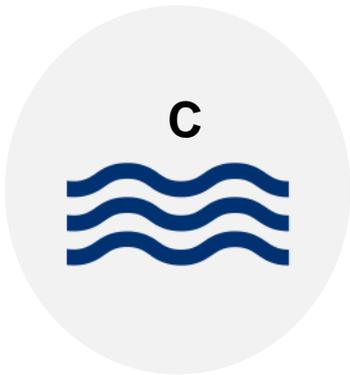
Vs.



Piece small

*The decommissioning of the Topside is estimated to require up to seven vessels depending on the selected method of removal. The difference in emissions between the methods may be up to 8000 tonnes of CO2*

**Process to consider emissions and climate change in procurement**



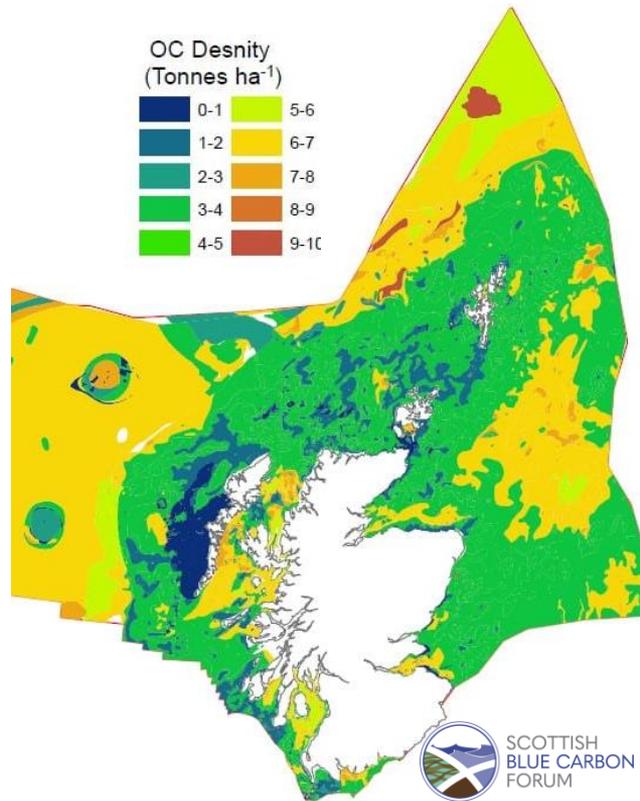
## Blue carbon and natural capital

- A significant proportion of carbon ('blue carbon') is believed to be stored in shelf sediments, overlapping with areas where offshore energy infrastructure are located
- The stability of these sediments, their ability to store carbon and how seabed disturbance affect blue carbon stores is uncertain.
- New research at the University of Essex and the University of St Andrews will explore how the decommissioning and physical removal of infrastructure is likely to disrupt these long term carbon stores

# INSITE

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science

Carbon stores in sediments (top 10 cm)



## Take home messages

- Scottish Government is committed to being a global leader in the field of climate change policy, both from adaptation (living with climate change) and mitigation (reducing our emissions of greenhouse gas emissions)
- Scotland has a legally binding target to reach net zero emissions of all greenhouse gases by 2045
- Marine Scotland are committed to ensuring the blue economy plays its part
- There is an urgent research need to develop the necessary evidence base
- The Scottish Government commitments to climate change are likely to filter down to decommissioning in the advice that MSS provide to operators and regulators
- This may include strengthening the current areas where climate change is considered, and consideration of new areas
- To support this, guidance is required from regulators and advisors, and key knowledge gaps must be addressed through research and industry collaborations