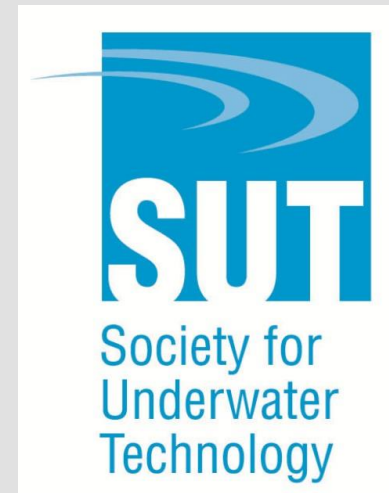


# Environmental Perceptions of Jacket Decommissioning Scenarios

Dr Kate Gormley



# Introduction

- **Is there a marine environmental case to support or challenge OSPAR Decision 98/3?**
- Session 1: Environmental Baselines
- Session 2: Environmental Interactions
- Short Break – to collate data
- Presentation by Nigel James, Waves Group
- Session 3: Decommissioning Scenarios

# MASTS initiative: OSPAR 98/3 and the marine environment

Dr Sally Rouse

# MASTS Oil & Gas Environmental Research Forum

## The forum has the following key objectives

- To identify and inform key environmental research issues facing industry
  - To improve understanding of industry-operations within the academic community
  - To facilitate multi-sector research to solve industry problems
  - To enable access/sharing of industry data
- 
- [www.masts.ac.uk/research/research-forums/oil-and-gas-environmental-research-forum](http://www.masts.ac.uk/research/research-forums/oil-and-gas-environmental-research-forum)

# OSPAR 98/3 and the marine environment

“ The dumping, and the leaving wholly or partly in place, of disused offshore installations within the maritime area is prohibited. ”

Installation (excluding topsides)	Weight (tonnes)	Complete Removal to land	Partial Removal to land	Leave wholly in place	Re-use	Disposal at Sea
Fixed Steel	<10,000	Yes	No	No	Yes (3)	No
Fixed Steel	>10,000	Yes	Yes (1)(2)	No	Yes(3)	No
Concrete - gravity	Any	Yes	Yes(2)	Yes	Yes	Yes(4)
Floating	Any	Yes	No	No	Yes	No
Subsea	Any	Yes	No	No	Yes	No

1. Only 'footings' or part of the 'footings' may be left in place
2. 55 m minimum clearance above partially removed structures required
3. Placement of material on the seabed for a purpose other than that for which it was originally intended is covered by OSPAR Guidelines on Artificial Reefs and excludes offshore installations
4. Disposal of concrete installation substructure at a deep-water site is an option, but this must be considered against UK Gov. announcements at the time of 98/3 that there would be no toppling and no local or remote dumping of offshore installations

# OSPAR 98/3 and the marine environment

- Does not include:
  - Any part of an offshore installation which is located below the surface of the seabed
  - Oil and gas pipelines
  - Concrete mattresses or other pipeline protection structures
- Decision driven by desire to protect the marine environment

# The MASTS Oil and Gas Environmental Research Forum

## Workshop in May 2017: Marine Environmental Issues Pertaining to the OSPAR 98/3 Decision

- 32 participants
- Academic researchers from fields of benthic ecology, marine mammals, fish ecology, geochemists, microbiologists
- Gather expert opinion on the likely interactions of decommissioning options with the marine environment.



# MASTS Workshop

## What was not considered

- Social aspects i.e. 'human' consequences.
- Broader environmental questions such as CO<sub>2</sub> emissions and resource use
- Existing environmental legislation. Environmental interactions were only considered based on ecological arguments, not because of statutory protection
- Cost
- Technical feasibility

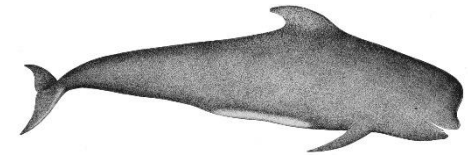


# MASTS Workshop

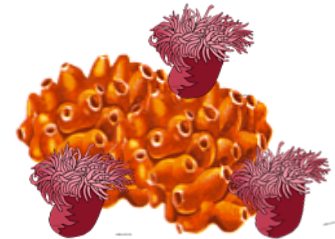
## Framework for workshop

- Three 'interaction categories' set

- Megafauna (marine mammals, birds, sharks)

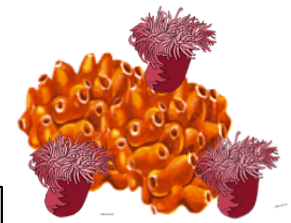
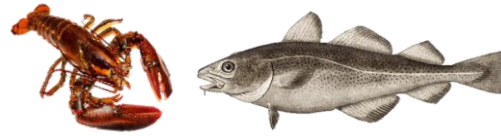
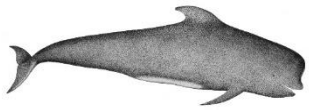


- Artificial reef effects and seabed disturbance



- Fish and shellfish





Change to food availability and alteration to food webs

Changes in ecological connectivity for larvae of benthic/fish species and megafauna

Impacts from associated noise

Dynamics of invasive species

Contamination/bioaccumulation from drill cuttings

Increase area of seabed trawled and changes to *de facto* no take zones

Disturbance from vessel movements associated with decommissioning

Changes to habitat use – foraging, resting, breeding

Loss of biodiversity hotspots

Loss of fish nursery grounds

Changes to biological productivity and mussel growth

Displacement and changes to fish behaviour

Changes to shelters from predation and aggregation

Loss of benthic biomass and productivity

Smothering of benthic communities

Seabed enrichment

Recovery of sedimentary habitat


Hydrographic changes and alteration to sedimentation

# Influence on uptake of contaminants by fish

## MASTS Workshop

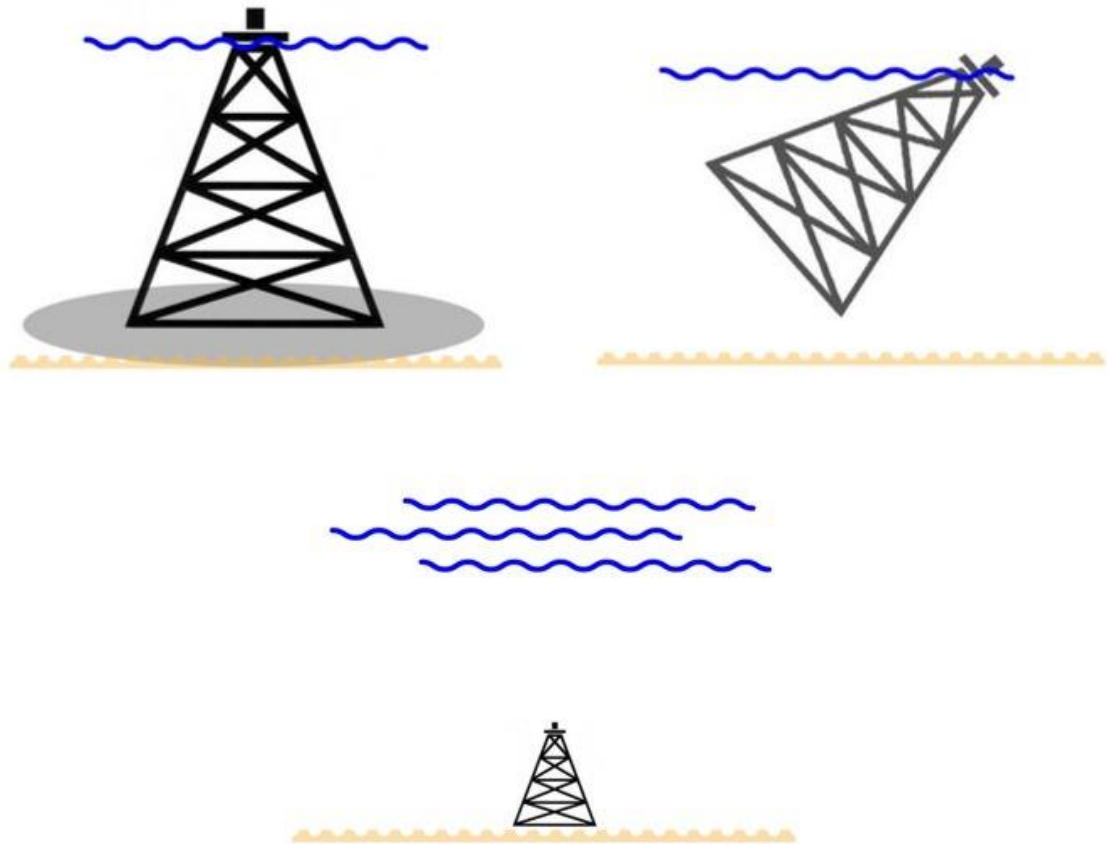
For top ranked interactions, specify whether the decommissioning scenario described would have a positive, negative, neutral or unknown impact at different time and spatial scales.



Day/month  
 Year  
Decade  
Century  
> Century


# MASTS Workshop

- Identify key knowledge gaps
- Vote on one of three decommissioning scenarios that best meets environmental objectives



# MASTS Workshop

## What next

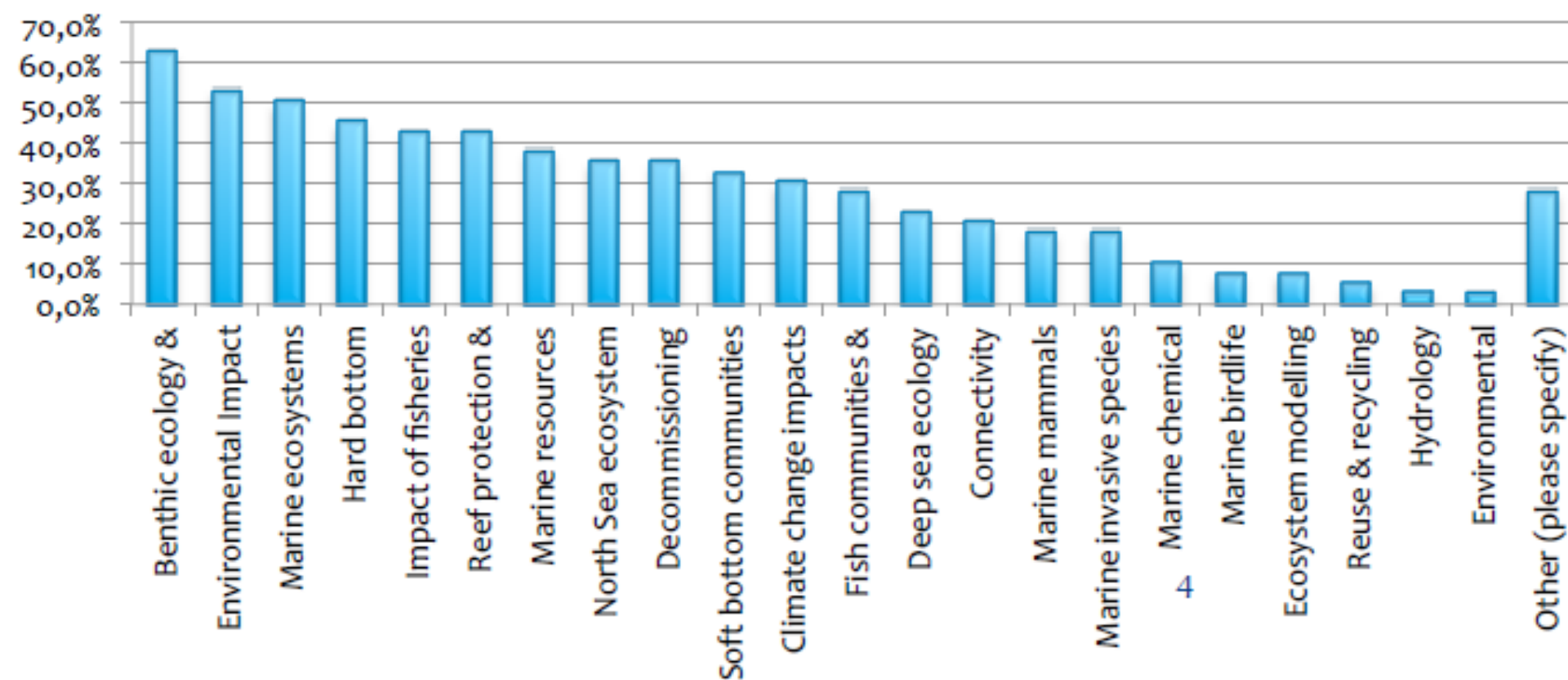
- Data from Researcher Workshop will form the basis of a review paper which will be submitted to a peer-review journal by end of the year
- Collate public perspectives on environmental considerations (today and stakeholder survey)
- Collate key knowledge gaps and use to inform and direct future funding proposals.

International  
initiatives:  
North Sea Futures

## North Sea Futures: expert survey

- An independent not-for-profit company based in Denmark
- Carried out expert survey of environmental effects of decommissioning options in the North Sea
- Contacted 200 researchers identified as experts by publication record or as recognised by others as experts within government or consulting
- Responses from 40 experts
- NGO and Industry dialogue meeting

## What are your specific areas of expertise?





## North Sea Futures: Expert survey

- Experts asked to agree or disagree with a series of statements relating to decommissioning
- Rank environmental criteria for decommissioning decisions
- Rank preferred decommissioning method out of twelve options, separated by structure type (platforms vs. wind turbines)

North Sea  
Futures:  
Expert  
survey

## 23 Environmental Criteria – top 10

1. Provision of reef habitat
2. Loss of the developed community
3. Enhancement of North Sea scale biodiversity
4. Alteration of trophic webs
5. Enhancement of local biodiversity
6. Reduced spread of invasive species
7. Protection from trawling
8. Chemical contamination of the seabed
9. Seabed disturbance
10. Reduced spread of indigenous or protected species

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# North Sea Futures: Manifesto

## Principles for next best practice for offshore decommissioning

1. Preferred decommissioning practices should first and foremost benefit the marine environment and safety of personnel
2. Respect for polluter pays principle
3. Respect for the precautionary principle
4. Decommissioning decisions should be made on the basis of solid science and case-by-case assessments
5. Assessments of the environmental impacts of decommissioning options needs to include assessment of natural capital stocks and potential trade offs
6. Facilitation of design, materials and governance models for new installations that contribute to a positive impact on ecosystem services

# North Sea Futures: Manifest

## Principles for next best practice for offshore decommissioning

7. Reduction of decommissioning costs should not in itself form an incentive to leave disused installations offshore
8. Reallocation of saved costs into a North Sea Environment Fund aimed at conservation and restoration
9. If chemically contaminated materials are left in situ they should be protected from disturbance by trawling
10. 500 m safety zone should be maintained in order to guarantee ecological value and safety of users of the sea
11. Decision making should be transparent and knowledge-based
12. A clear distinction must be made between Marine Protected Areas and protected areas with man-made habitats

## Session 1: Baselines

- When measuring environmental implications of decommissioning (for multiple scenarios) – what baseline should we measure environmental impacts against?
  1. Pre-installation of Jacket (e.g. undisturbed seabed) or
  2. Current state (e.g. as Jacket is installed)
- Under the OSPAR Decision 98/3, determination of environmental impacts for decommissioning scenarios should consider the baseline as a clean seabed (as per pre-installation).
  - Given structures have been in the water for up to 40 years, and pre-installation environmental data may not be rigorous (not comparable/repeatable, incomplete), should this be challenged?
- *Break-out discussion – discuss pros and cons of each baseline – 10mins*
- *Following the discussion - on the Session 1 voting slip, note you sector and select your preference.*

# Sectors

1. NGO
2. Regulators
3. Government Advisors
4. Industry (e.g. operator or contractor)
5. Environmental consultants (oil and gas)
6. Other energy industries (e.g. non-oil and gas, renewables, carbon capture)
7. Fishers
8. Other marine users (e.g. MOD, salvors)
9. Academics
10. Other (none of the above)

## Session 2: Interactions

- **What are the most important environmental considerations relevant to decommissioning?**
  1. Changes to non-native invasive species presence/abundance
  2. Changes to benthic biodiversity, biomass and biogenic habitats - native species
  3. Attraction to structures and changes to feeding patterns for megafauna
  4. Uptake of pollutants by fish
  5. Change in abundance of reef-based fish and shellfish
  6. Change in commercially exploited fish stocks
  7. Changes in fish population connectivity (larval dispersal, foraging, shelter)
  8. Changes in area of seabed exposed to fishing



## Session 2: Instructions (cont.)

- *Break-out discussion – consider the 8 environmental interactions presented on the previous slide - 10 mins*
  - *which is the most important interaction to consider?*
- On the stickers provided (numbered 1 – 8) write your sector on each sticker.
- Rank the interactions in order of your perceived importance (1 = highest importance, 8 = lowest importance)
- *Place numbered sticker on the corresponding interaction's flipchart placed around the room – 10 mins*

# Break

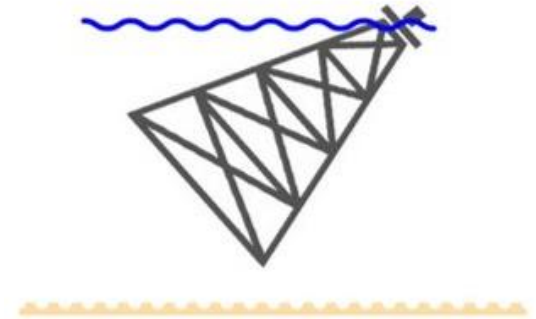
- Short break to collate results
- Presentation: **Nigel James**, Master Mariner, Director, Waves Group: **Technical challenges of scuttling ships (with video footage)**

## Session 3: Decomm scenarios

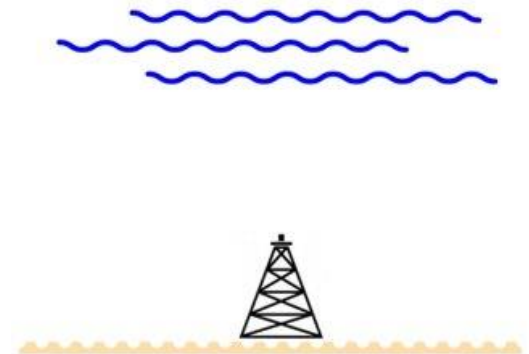
- Scenario one: Leave all platforms in the OSPAR area, with 500 m fisheries exclusion zone maintained



- Scenario two: Remove all platforms in the OSPAR area. Seabed open to fishing



- Scenario three: Remove all platforms in the OSPAR area. Deep-sea disposal of structures beyond fishing limits



## Session 3: Instructions

- What are the consequences of decommissioning to the marine environment?
  - Based on the information you are presented with in the matrices, which decommissioning scenario would you select?
- Based on the scenarios described in the previous slides, you will be now shown a positive/negative/neutral matrix for the 3 topped ranked environmental interactions
- Consider the matrices for scenarios 1, 2
- *From the information you are presented with here, which scenario would you select?*
- *Select an option of the voting slip provided*

# Session 3: Instructions

## Matrix key

*Positive impact*

+

*Negative impact*

-

*Neutral impact*

=

*Contested*

+/-

*Unknown*

?

**Baseline: current structures**

Changes to  
non-native  
species  
presence  
and/or  
abundance

	Local	Regional
Short term	-	-
Long term	?	-

Scenario 1

	Local	Regional
Short term	+/-	-
Long term	+/-	-

Scenario 2

Changes to  
benthic  
biodiversity,  
biomass and  
biogenic  
habitats –  
native  
species

	Local	Regional
Short term	+	+
Long term	+	+

Scenario 1

	Local	Regional
Short term	-	-
Long term	-	-

Scenario 2

# Megafauna attraction to structures and changes to feeding patterns

	Local	Regional
Short term	=	?
Long term	?	?

Scenario 1

	Local	Regional
Short term	?	?
Long term	-	?

Scenario 2



Changes to uptake of pollutants and chemical contamination of fish

	Local	Regional
Short term	+/-	=
Long term	=	=

Scenario 1

	Local	Regional
Short term	-	?
Long term	-	?

Scenario 2

# Changes in abundance of reef-based fish and shellfish

	Local	Regional
Short term	=	=
Long term	=	=

Scenario 1

	Local	Regional
Short term	-	-
Long term	-	-

Scenario 2

# Changes in commercially exploited demersal fish stocks

	Local	Regional
Short term	=	?
Long term	=	?

Scenario 1

	Local	Regional
Short term	-	?
Long term	-	?

Scenario 2

Changes in connectivity of fish populations (larval dispersal, foraging and shelter opportunities)

	Local	Regional
Short term	+	?
Long term	+	?

Scenario 1

	Local	Regional
Short term	+/-	?
Long term	+/-	?

Scenario 2

# Changes in area of seabed fished


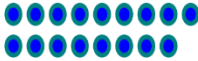



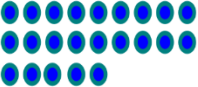


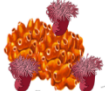





	Local	Regional
Short term	+	?
Long term	+	?

Scenario 1

	Local	Regional
Short term	-	?
Long term	-	?

Scenario 2

# Outputs of academic workshop

	Leave	Remove	Deep sea	No pref
				
				
				
Overall				

## Scenario 2

- Leave in situ
- Majority has agreed an environmental case can be made for leaving in situ
- Marine environmental case to challenge aspects of 98/3
- How should the marine environmental case be weighted against other considerations?
- What does this mean in terms of policy?
- What does this mean for other industry?

## Scenario 3

- Removal
- Majority has agreed an environmental case can be made for removal
- Marine environmental case to support 98/3
- How should the marine environmental case be weighted against other considerations?
- What does this mean in terms of policy?
- What does this mean for other industry?



Follow up  
and next  
steps

1. Collate data
2. Survey to fill in sector blanks
3. Summary of outputs to delegates
4. Review paper
5. MASTS initiative for research

# MASTS Research Initiative

## MASTS initiative for research

- Platforms or other infrastructure that will be cold-stacked
- Industry: could you facilitate vessel access along side such infrastructure?
- Researchers: could you use access to infrastructure for your research programme?