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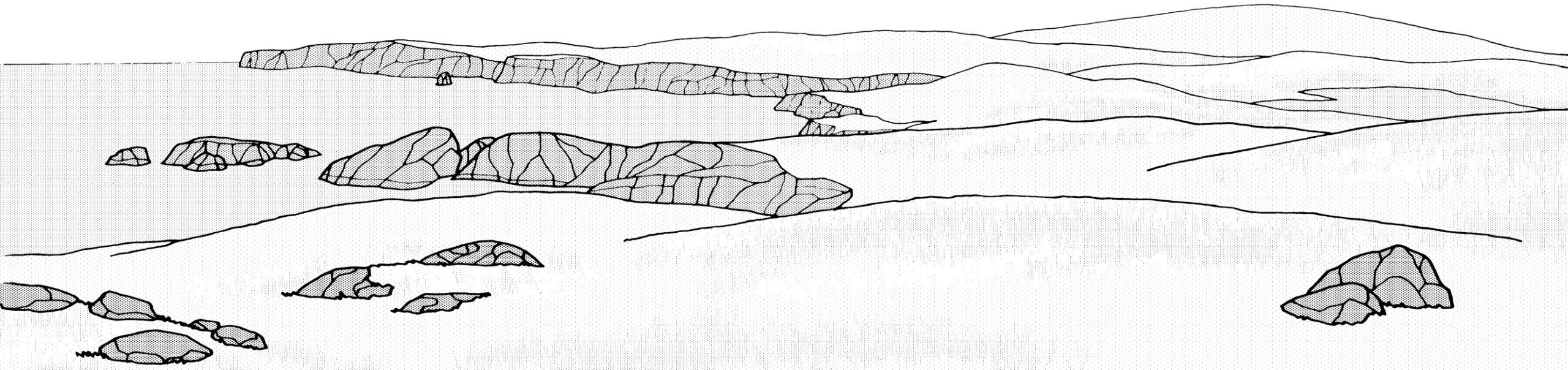
SHETLAND OIL TERMINAL
ENVIRONMENTAL
ADVISORY GROUP

Coastal Assessment, Liaison & Monitoring

The Importance of Time Series to understand Long-Term Impacts

Rebecca Kinnear (SOTEAG) & Jon Moore (CALM)



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SOTEAG's role is relevant and essential to:

- Preserve Shetlands natural heritage.
- Share the many years experience of environmentally responsible industrial activity in a sensitive environmental setting.

SOTEAG will provide early warning of environmental change and advise on remedial action, where appropriate.

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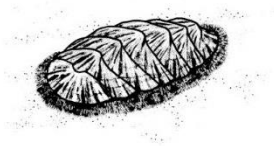

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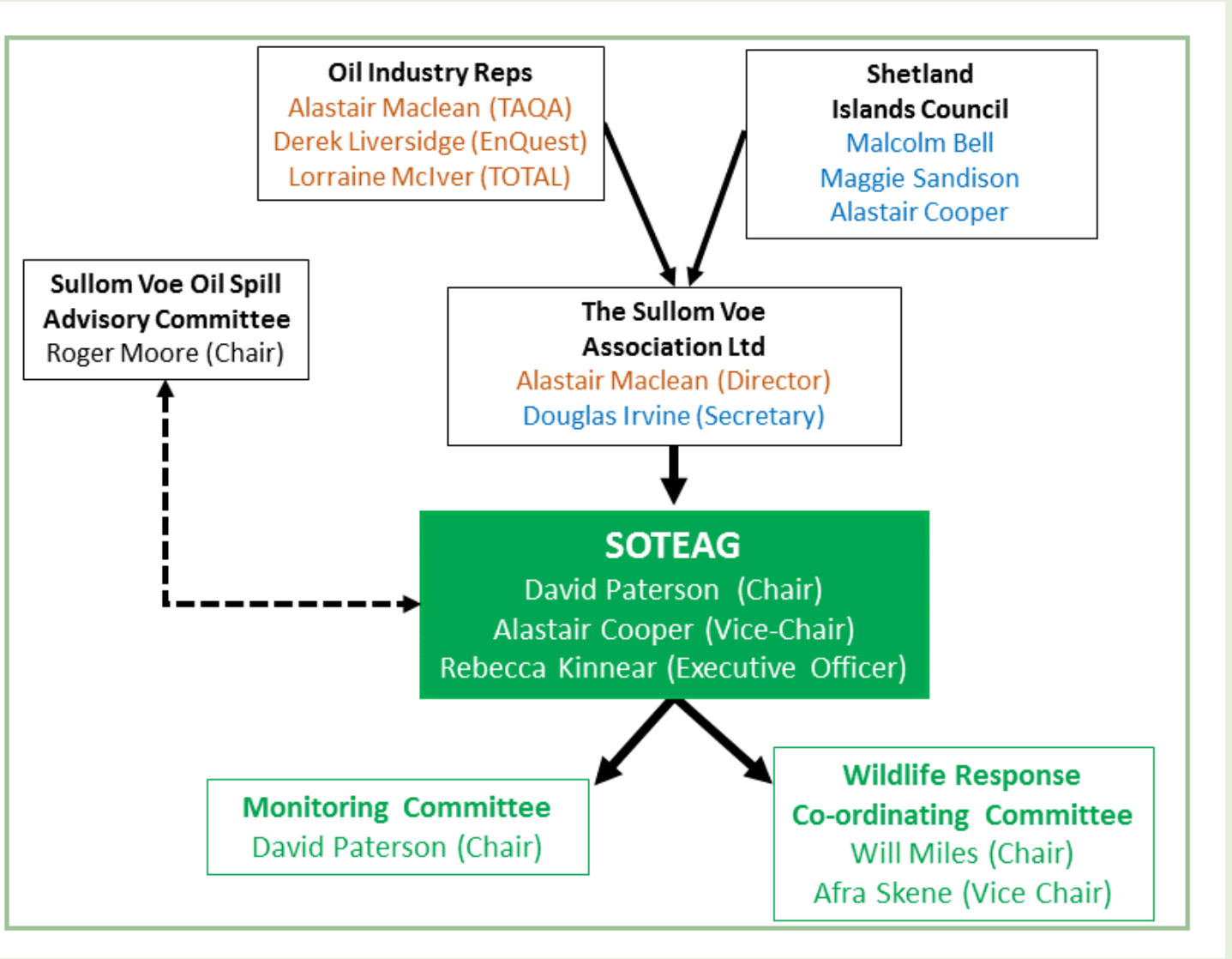
SOTEAG has monitored the environment around Shetland's Sullom Voe Oil Terminal and Port for 4 decades.

Integrity is assured by the selection of:

- an independent Chairperson
- an independent Executive Officer
- a diverse membership drawn from academia, the oil industry, central and local government, government statutory agencies, indigenous industries and environmental NGO's.

The number of Oil Industry Reps and Shetland Island Councillors are always balanced.

The monitoring committee is based on the expertise of the person, not the institution to which they are affiliated.



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Core environmental monitoring programme

Monitoring Programme	Frequency
Marine chemistry and macrobenthos (1978)	Biennial (even years)
Rocky shore (1974)	Annual
Dog whelks (1991)	Every three years
Seabirds (1978)	Annual

Designed to detect and measure both chronic and acute change in the surrounding environment.

It provides an up to date and accurate baseline should a spill occur.

SOTEAG is contributing to the National Seabird Census with RSPB, JNCC and SNH etc.

The monitoring programme is reviewed by independent reviewers annually.

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SOTEAG data is a rare resource; 40 years of almost continuous environmental data for rocky shores, seabirds and marine chemistry/macrobenthos.

This type of continuous data can provide examples of temporal change, whether natural or due to unnatural effects.
Examples:

- SOTEAG seabird data (declining numbers)
- SOTEAG dogwhelk data (impact of TBT contamination and the subsequent recovery).

These data sets provide evidence for the importance of regular background monitoring.

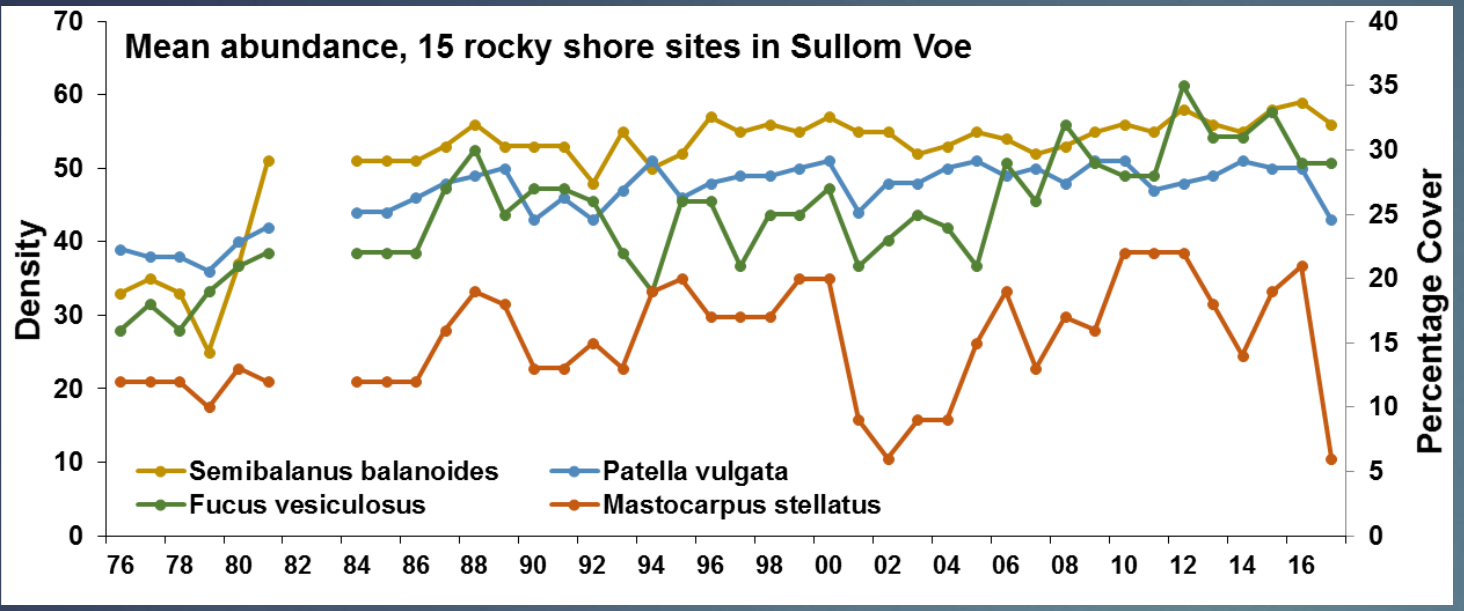
Data is currently being quality checked and placed into databases ready to be deposited in nationally recognised/managed data archives.

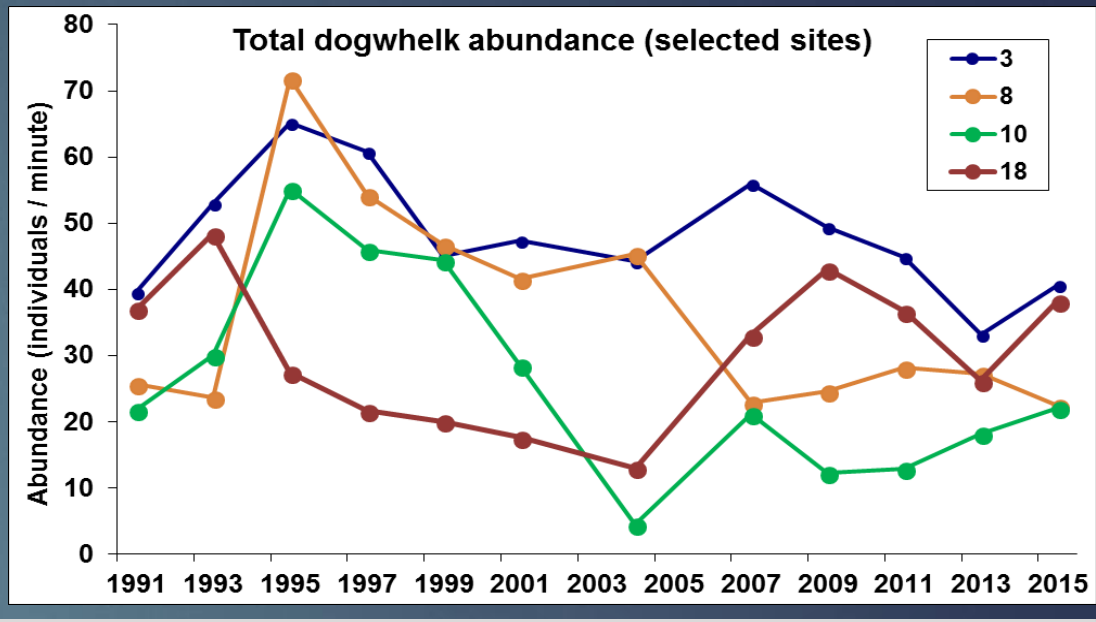
Data will conform to MEDIN data standards – marine environmental data and information network and will be readily available.

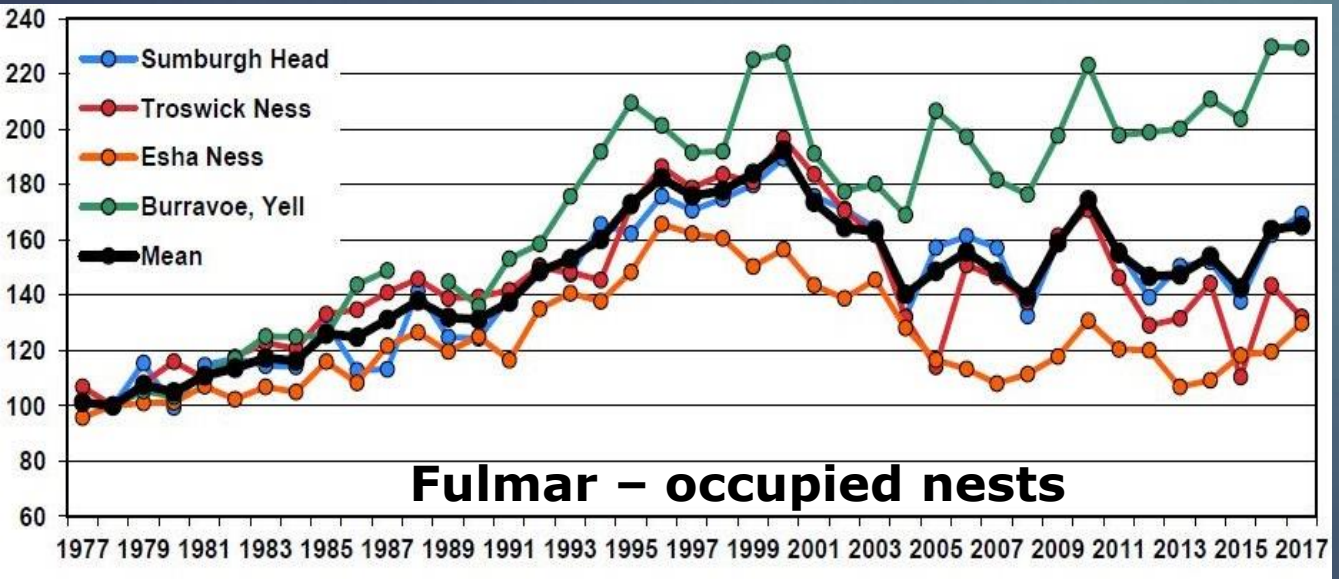
Time series data: understanding long term impacts

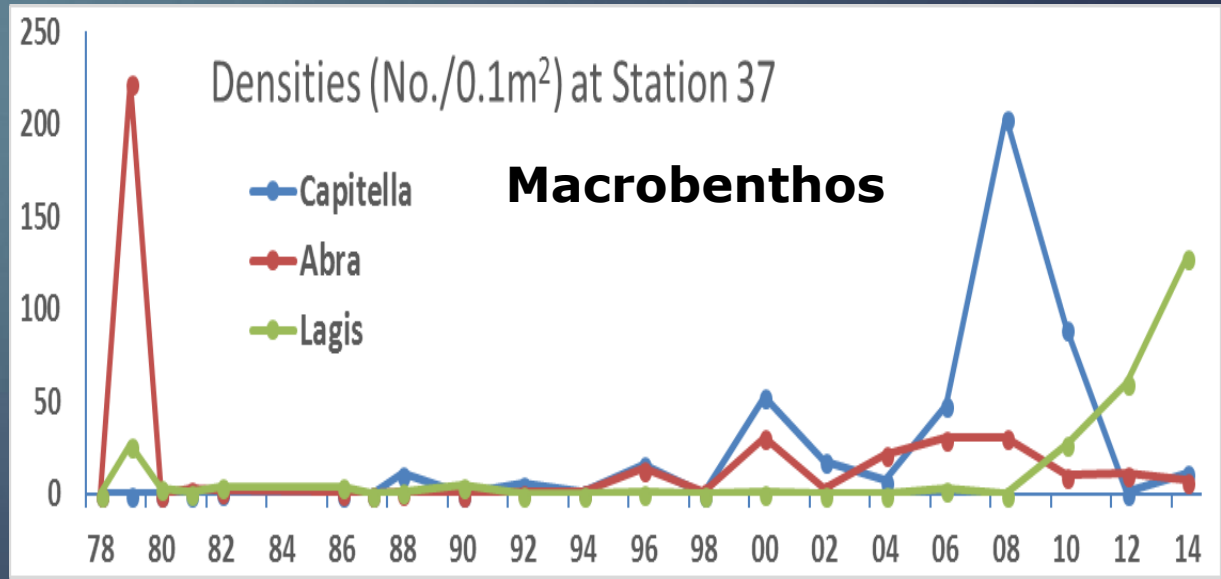
- Improving our knowledge of marine species and communities and how they change
- Detecting effects against a background of natural variation
- Detecting effects against a background of shifting baselines
- Developing and improving impact assessment methodologies by learning their limitations

Improving our knowledge of species & communities









Detecting effects against a background of natural variation

Esso Bernicia oil spill, Dec 1978: Long-term impact at Scatsta Ness

oil spill

Ascophyllum nodosum
(knotted wrack)

	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
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Detecting effects against a background of natural variation
Effects of TBT on dogwhelks

Dogwhelk abundance on Transect 4.3

	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17
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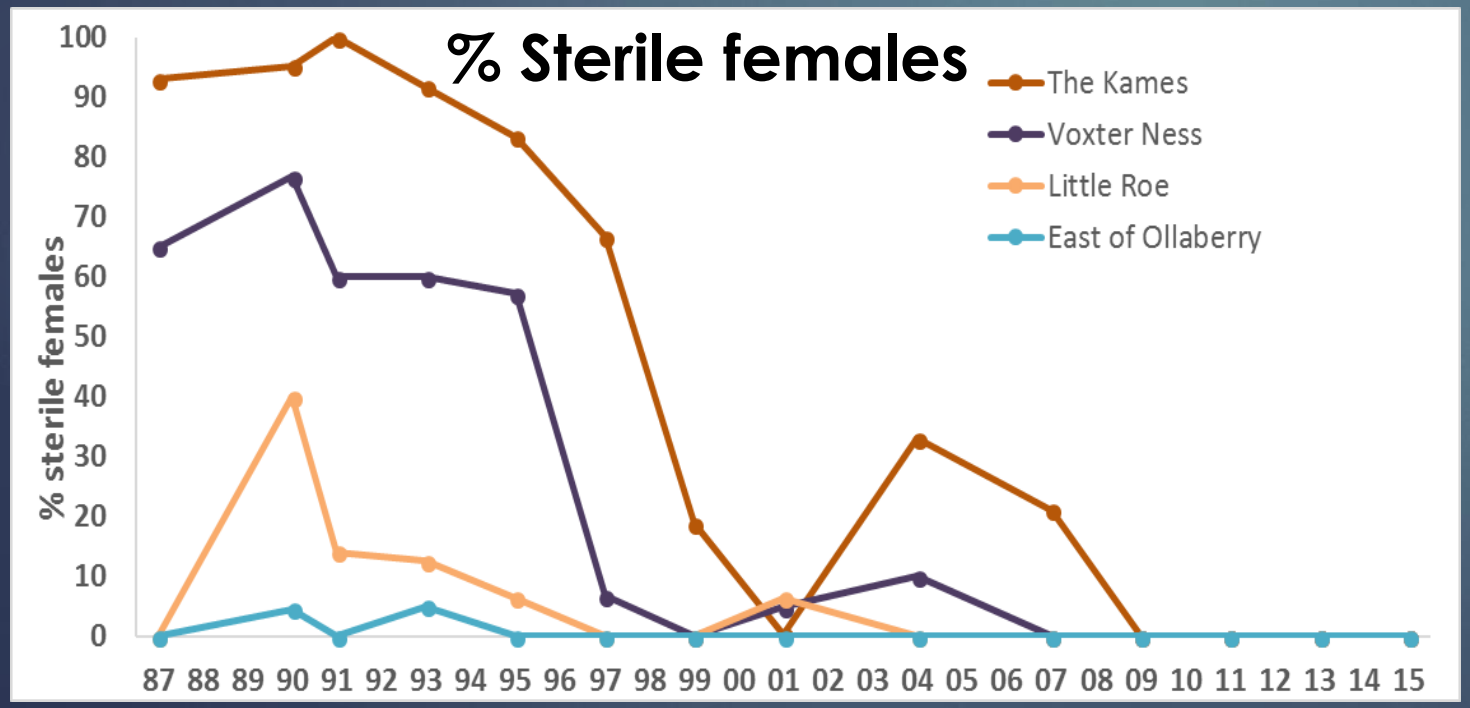
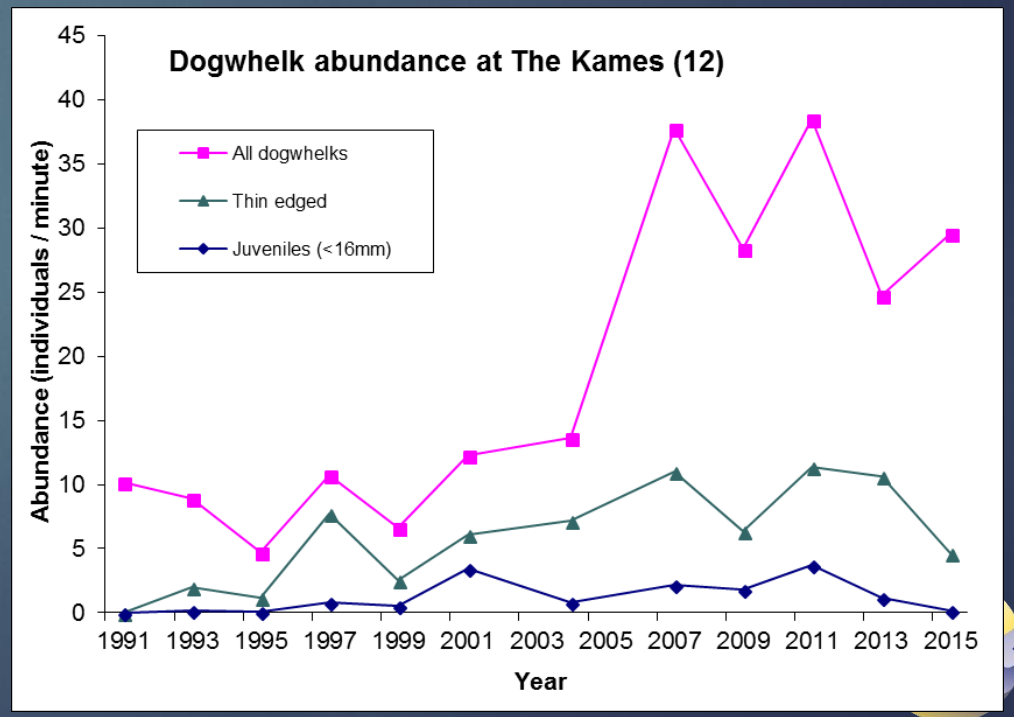
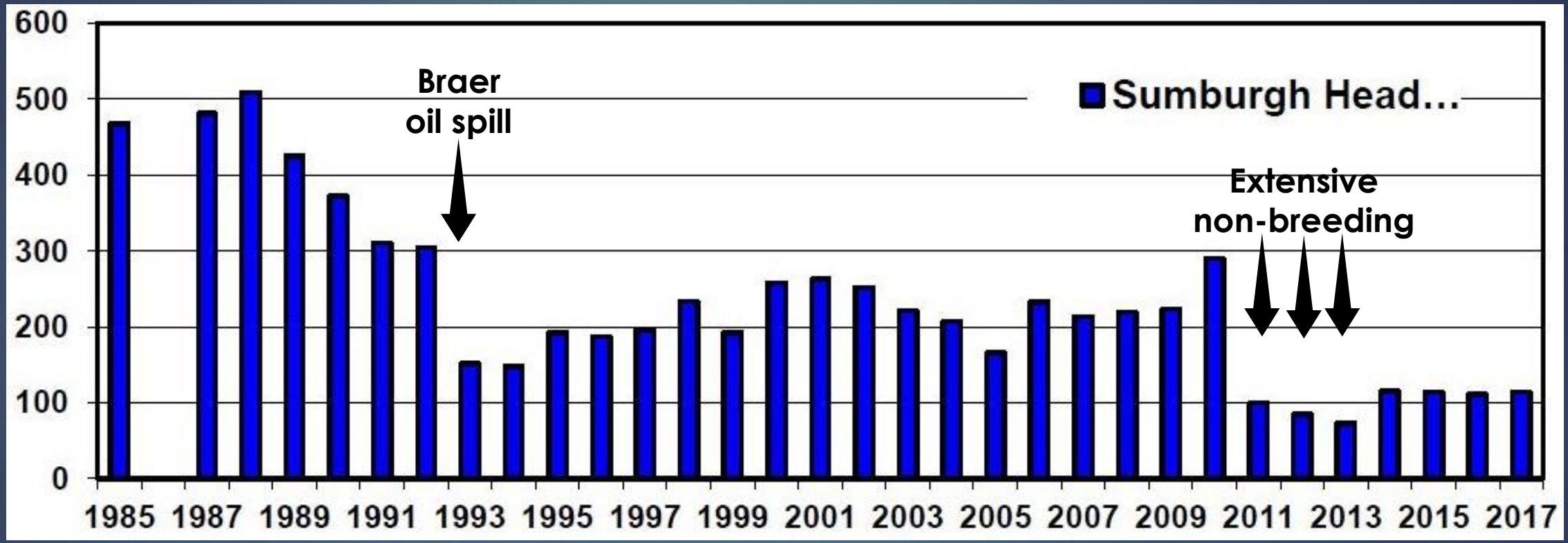




Detecting effects against a background of shifting baselines

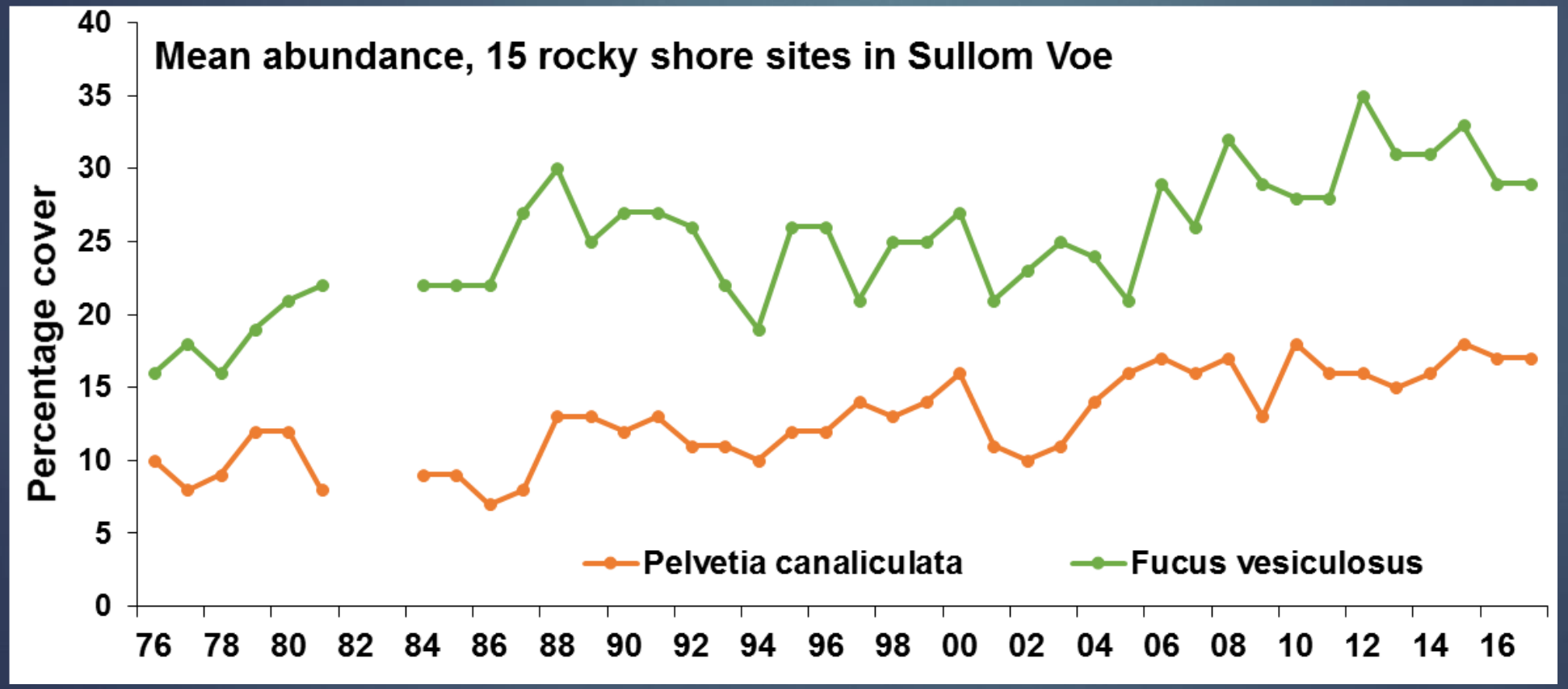
- Shag nests (counts from land)



Heubeck *et al*. (2018) Ornithological monitoring programme in Shetland, 2017. A report to SOTEAG by Aberdeen Institute for Coastal Science and Management.

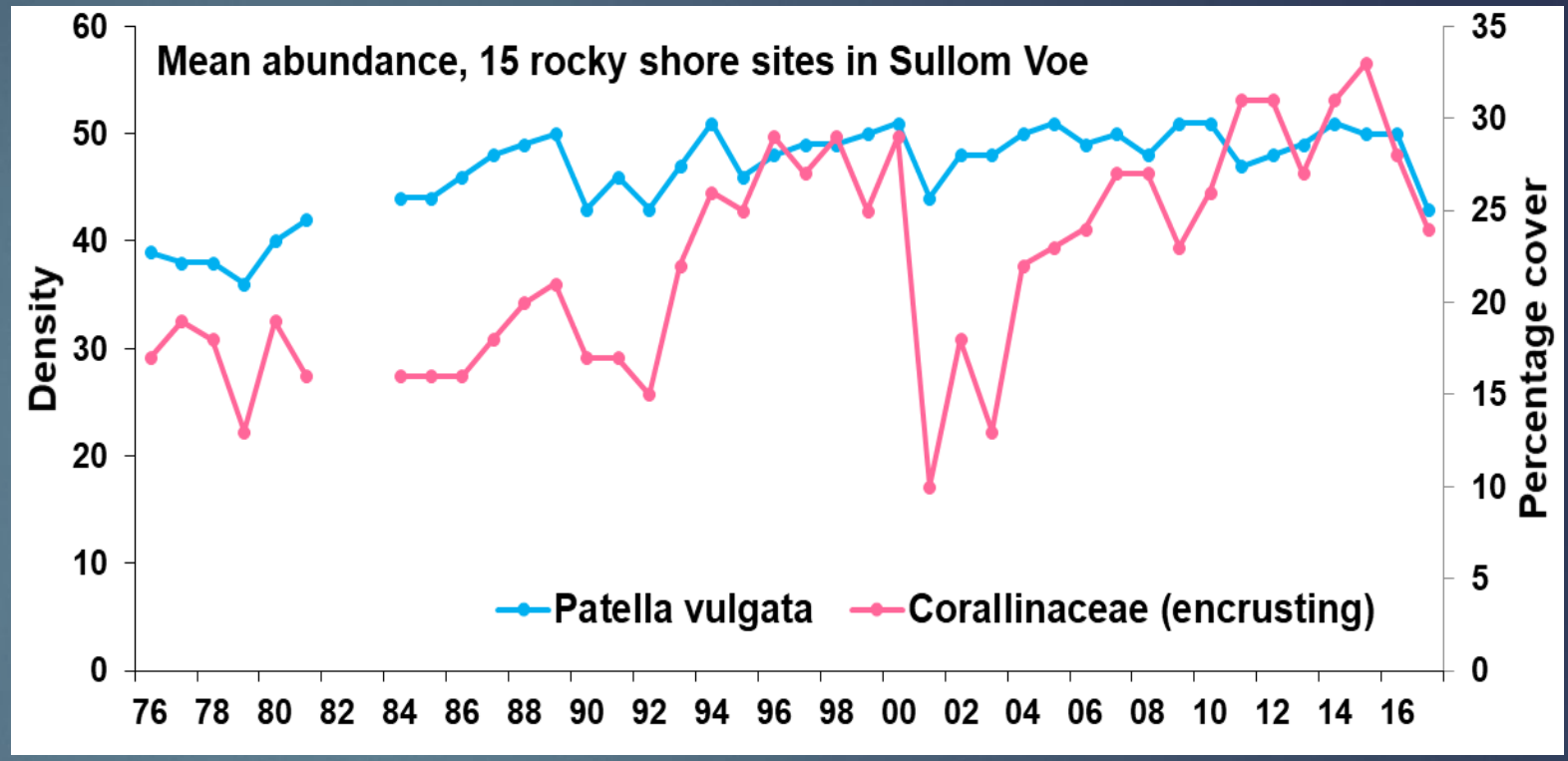
Detecting effects against a background of shifting baselines

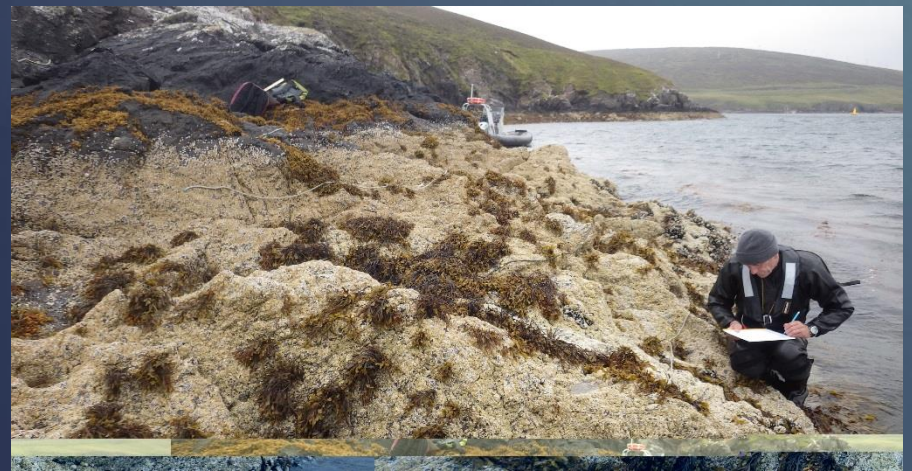
- Gradual rise in fucoid algae abundance

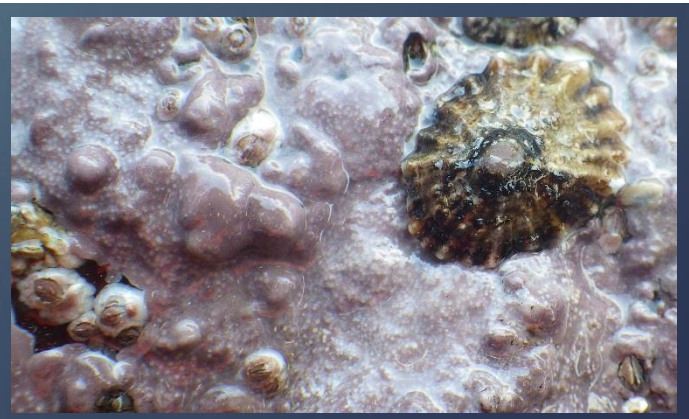


Developing impact assessment methodologies

- Learning their limitations
- Identifying strengths and weaknesses – species, attributes, techniques
- Gradually improving protocols







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Coastal Assessment, Liaison & Monitoring

Acknowledgements:

Martin Heubeck & Will Miles (SOTEAG Seabird Monitors) for SOTEAG seabird data

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