



## Agenda

- Meeting** Scarborough and Whitby Area Committee
- To:** Councillors Liz Colling (Chair), David Chance (Vice-Chair), Derek Bastiman, Eric Broadbent, David Jeffels, Janet Jefferson, Rich Maw, Clive Pearson, Heather Phillips, John Ritchie, Tom Seston, Subash Sharma, Neil Swannick, Roberta Swiers and Phil Trumper.
- Date:** Monday, 23 March 2026
- Time:** 10.00 am
- Venue:** Scarborough Town Hall, St Nicholas Street, Scarborough, YO11 2HG

This meeting is being live broadcast and recorded and will be available to view [via our website](#) and uploaded to [our Youtube channel](#).

### Business

7. **Professor Darren Grocke (Professor of Stable Isotope Geochemistry, University of Durham)** (Pages 3 - 12)

Members of the public are entitled to attend this meeting as observers for all those items taken in open session. You may be interested in [subscribing to updates](#) about this or any other North Yorkshire Council committee.

Recording is allowed at Council, committee and sub-committee meetings which are open to the public. Please give due regard to the Council's protocol on audio/visual recording and photography at public meetings. We ask that any recording is clearly visible to anyone at the meeting and that it is non-disruptive.

Anyone wishing to record is asked to contact the Democratic Services Officer (details below) prior to the start of the meeting.

#### Contact Details

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Barry Khan  
Assistant Chief Executive  
Legal and Democratic Services  
County Hall  
Northallerton

18 March 2026

# Nitrogen pollution from Scalby Beck: its impact on Scarborough north and south bays

**Prof Darren R. Gröcke**

Professor in Stable Isotope Biogeochemistry

[d.r.grocke@durham.ac.uk](mailto:d.r.grocke@durham.ac.uk)

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Agenda Item 7

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# Nitrogen Isotopes as a Source of Pollution

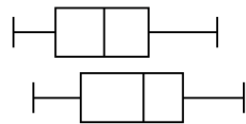
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deep ocean

synthetic fertilizers

ammonium  
nitrate

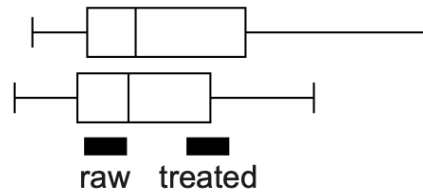


**Fucus**

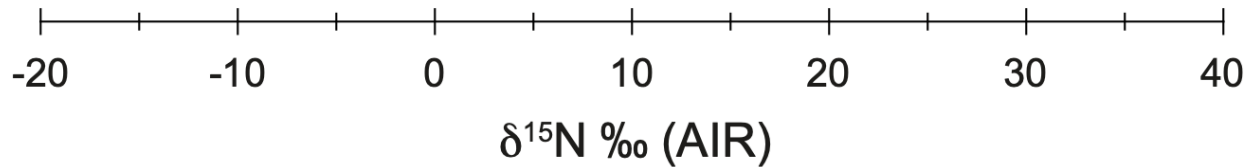
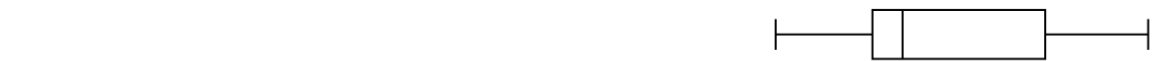
(nitrogen ~13–30 days)

animal manure

human sewage



sea-bird guano



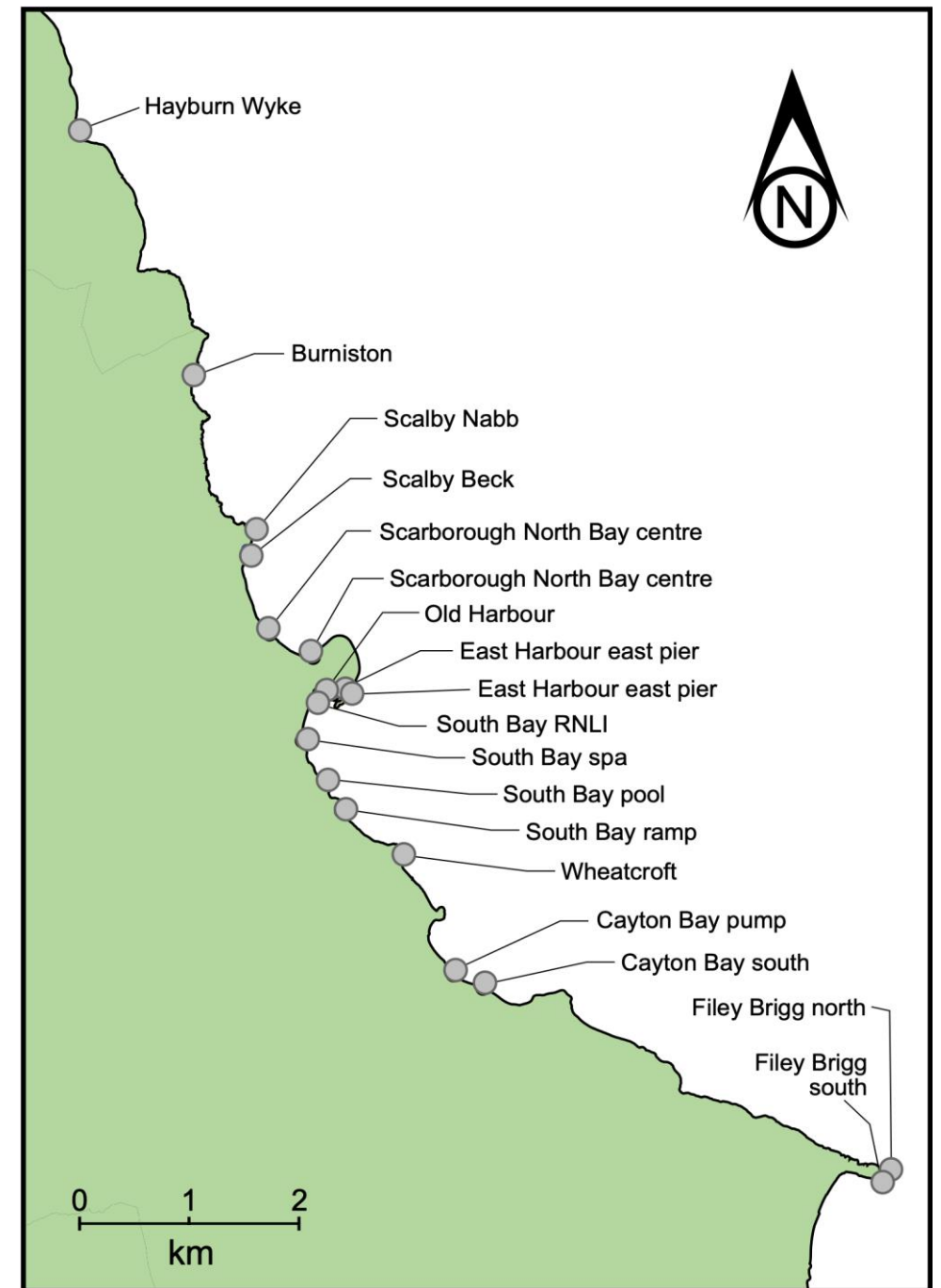
# Scarborough Sites

Over 3400 individual specimens of seaweed collected since September 2023 to October 2025

18 sampling locations for seaweed and water

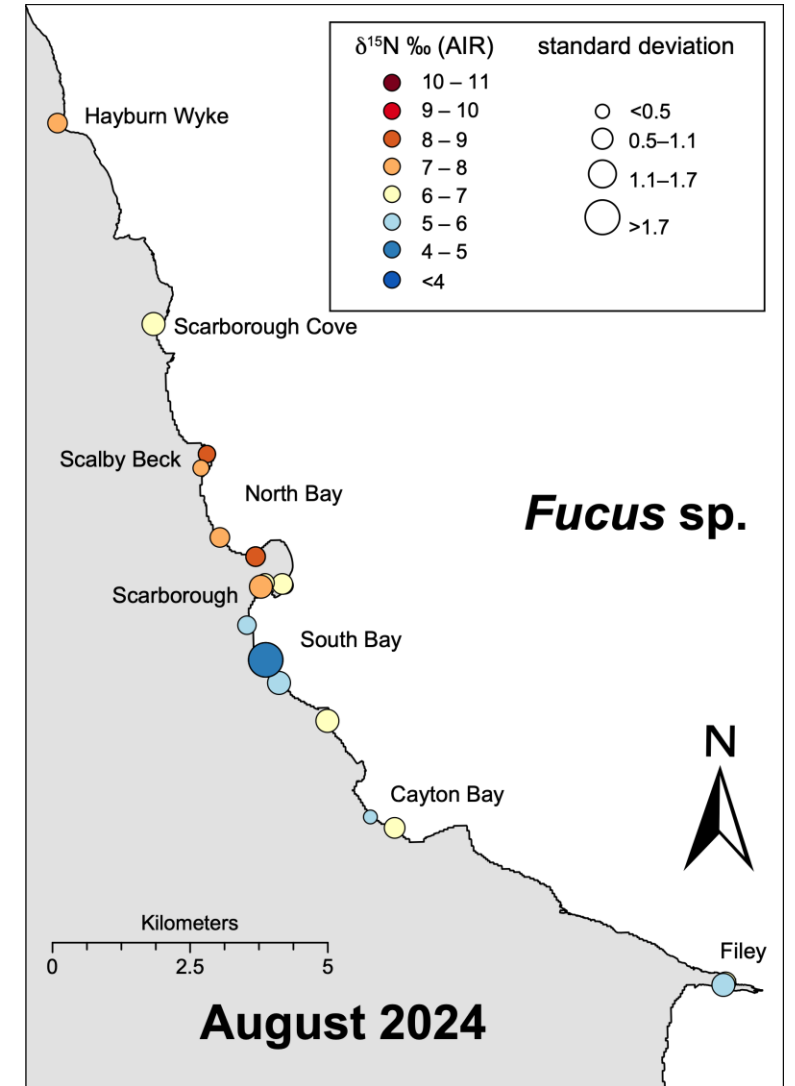
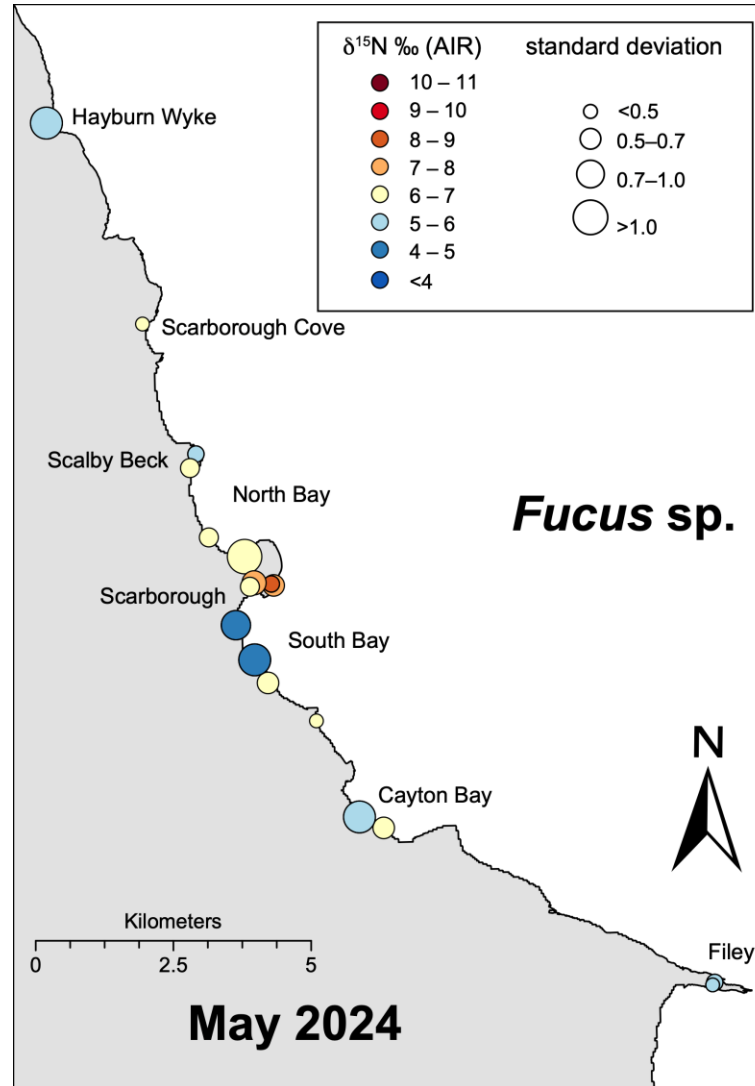
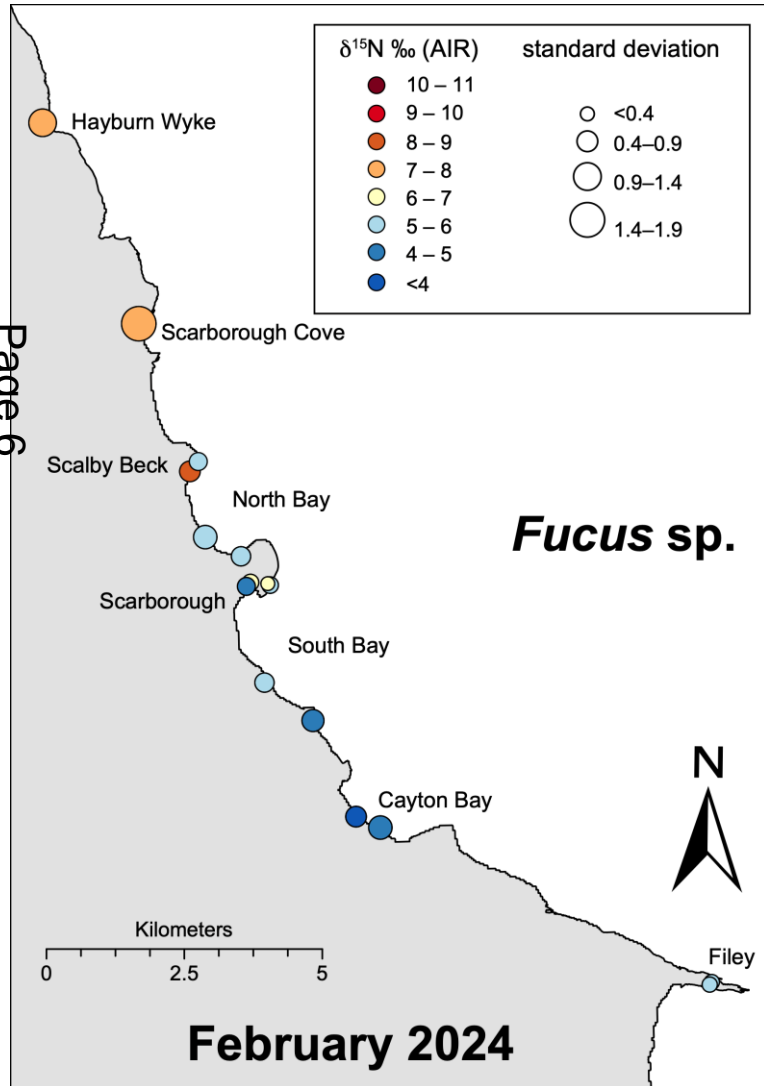
Seaweed consisted of *Fucus* sp. and *Ulva* sp.

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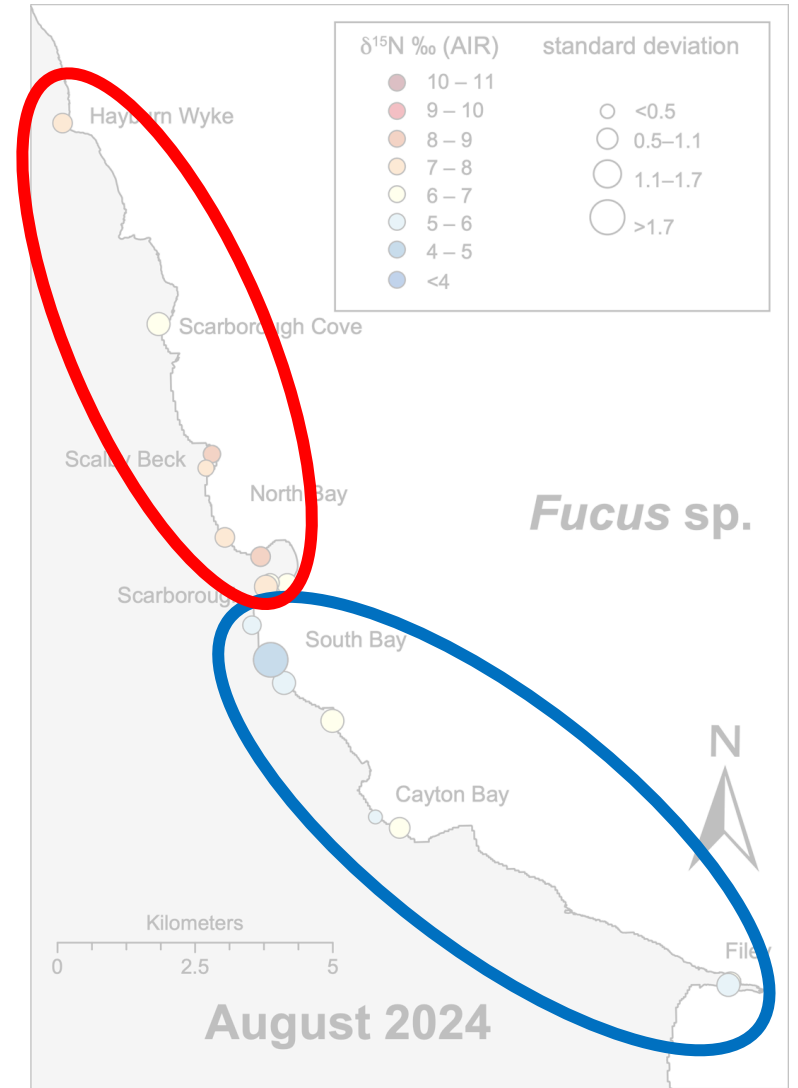
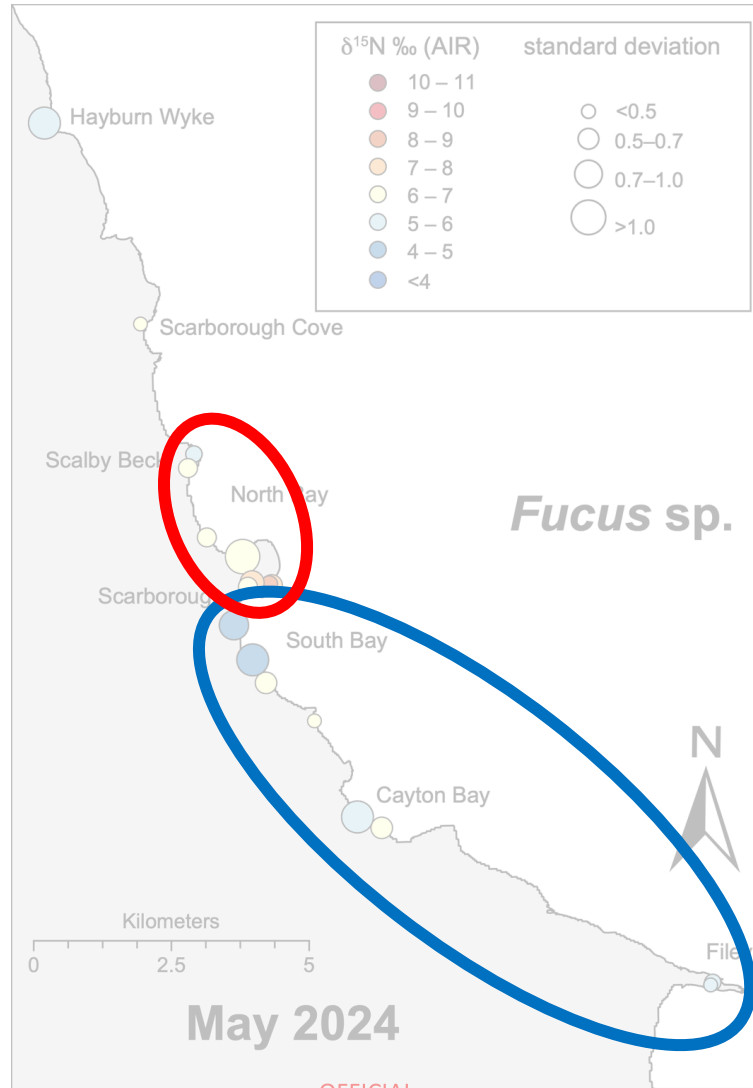
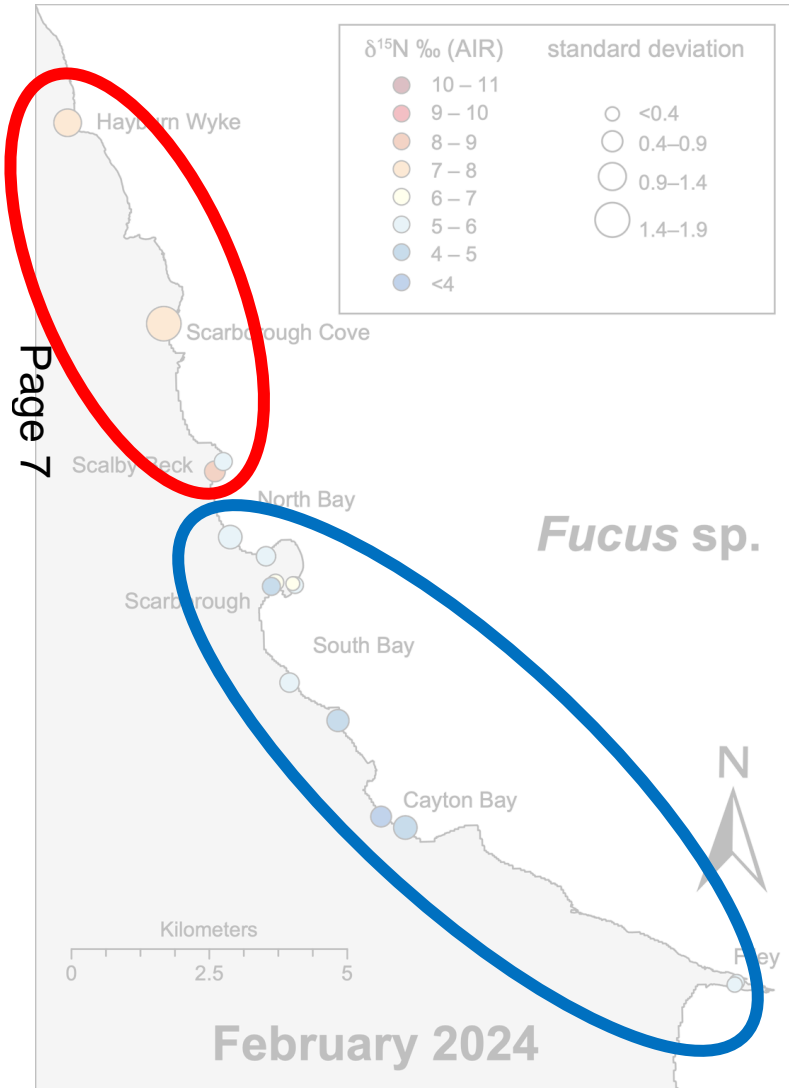


# Scarborough Annual Study

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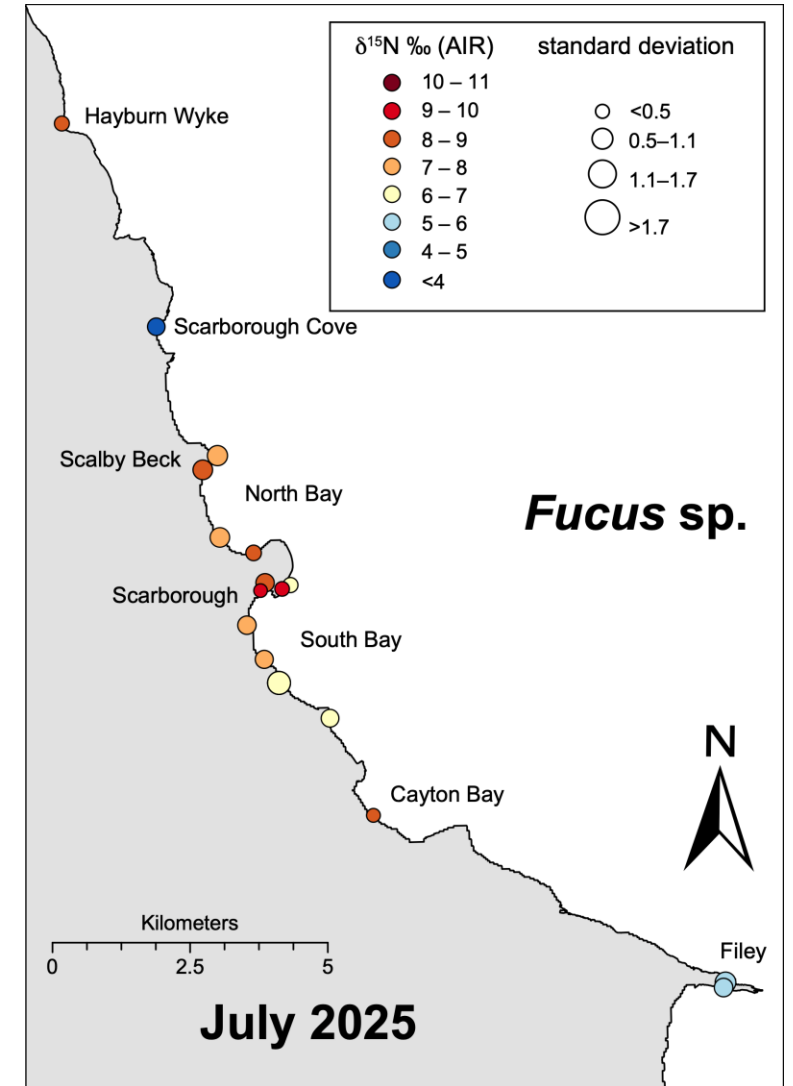
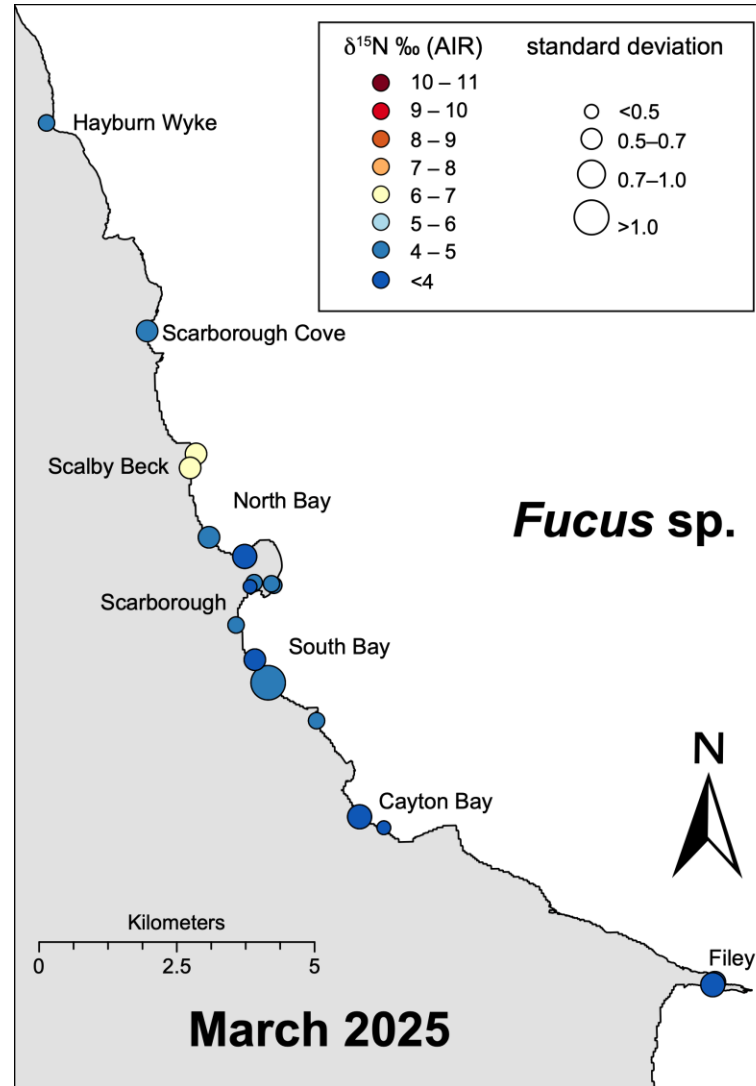
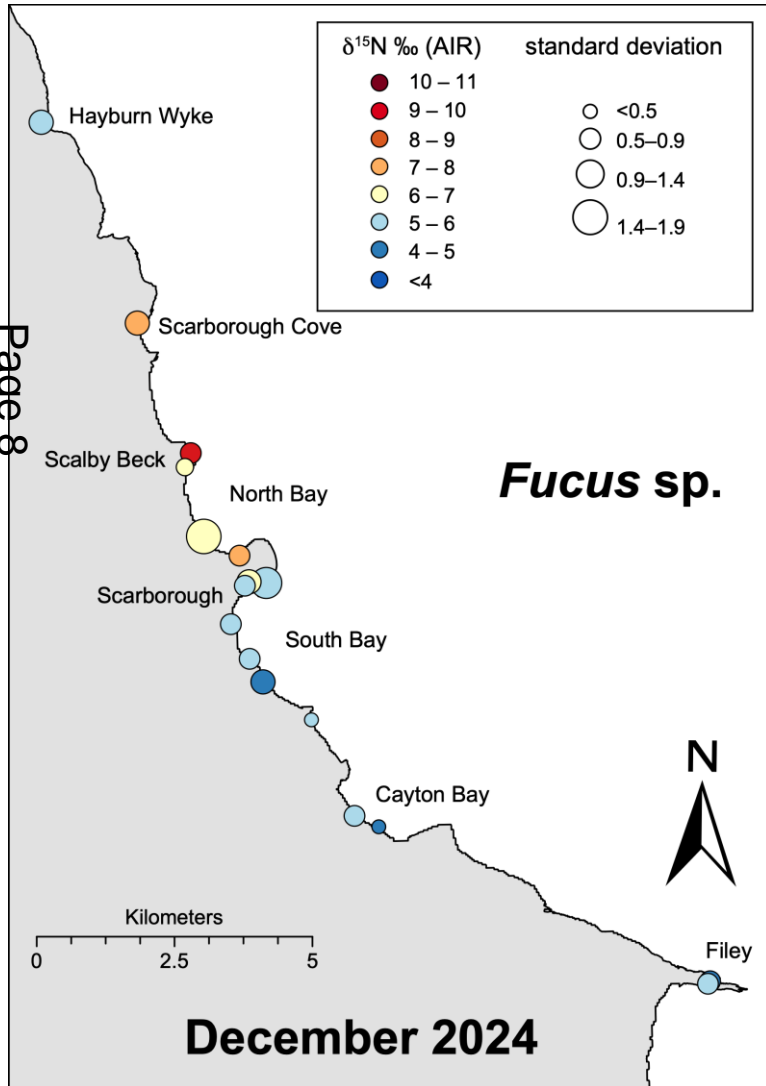


# Scarborough Annual Study



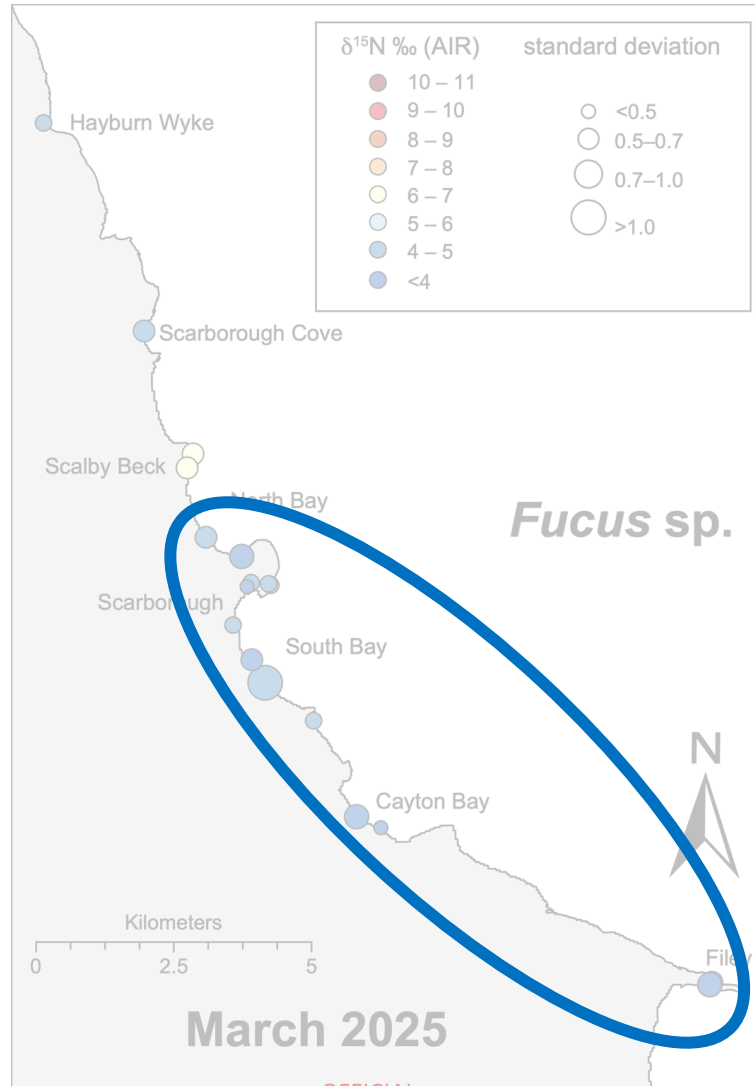
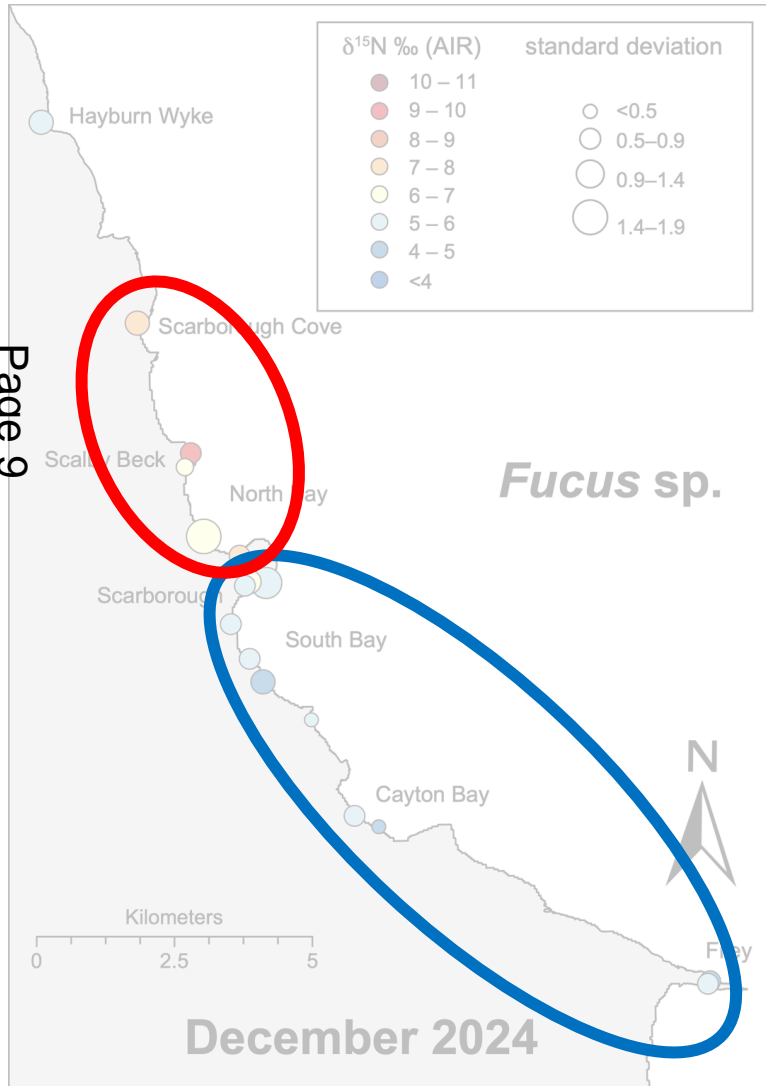
# Scarborough Annual Study

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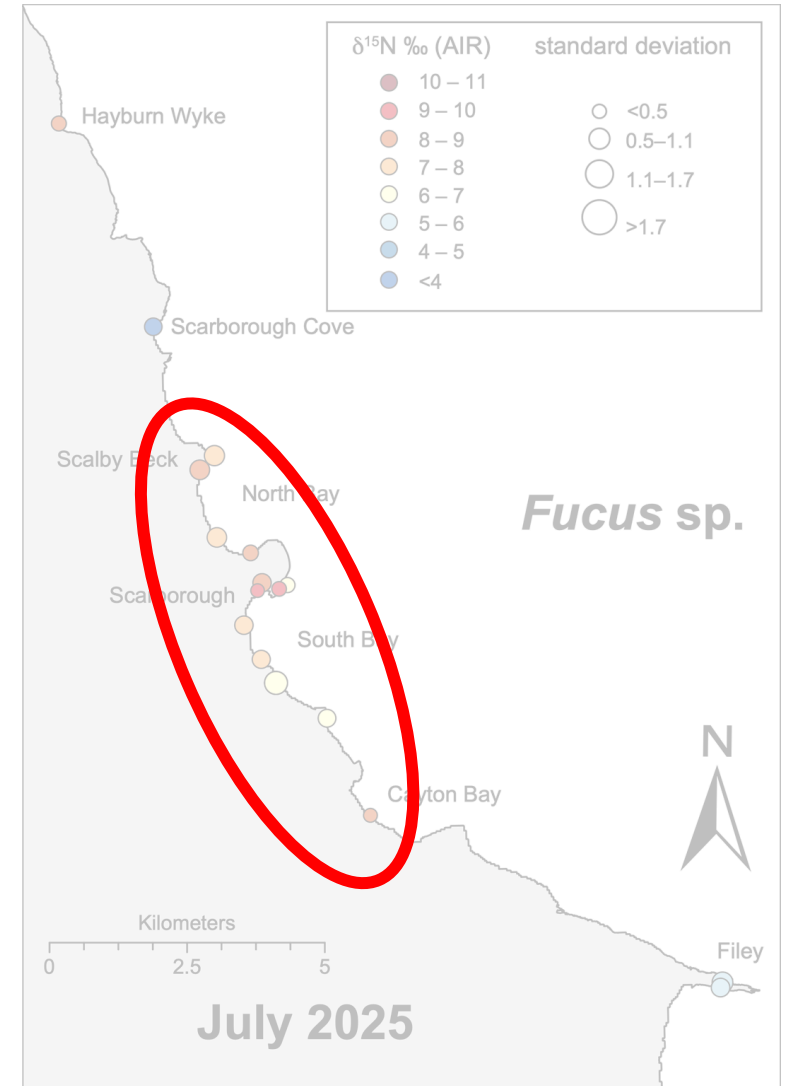


# Scarborough Annual Study

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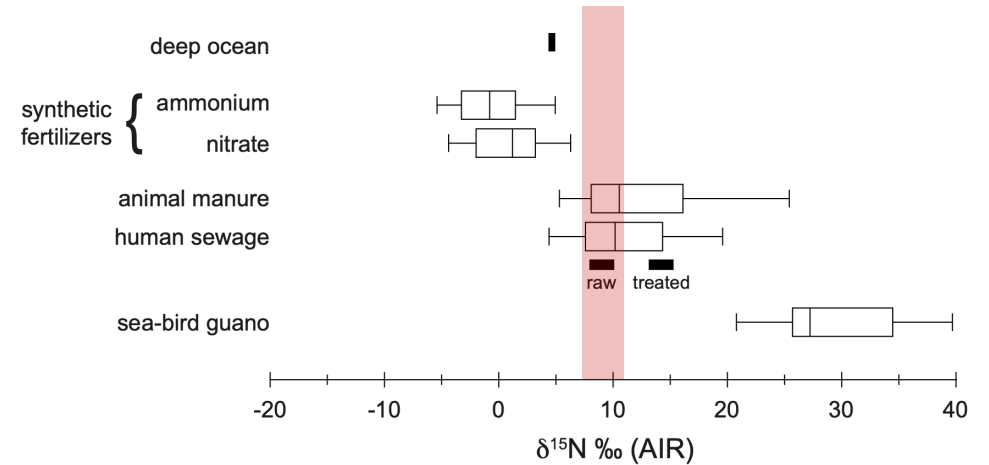


# Nitrogen sources = manure & sewage

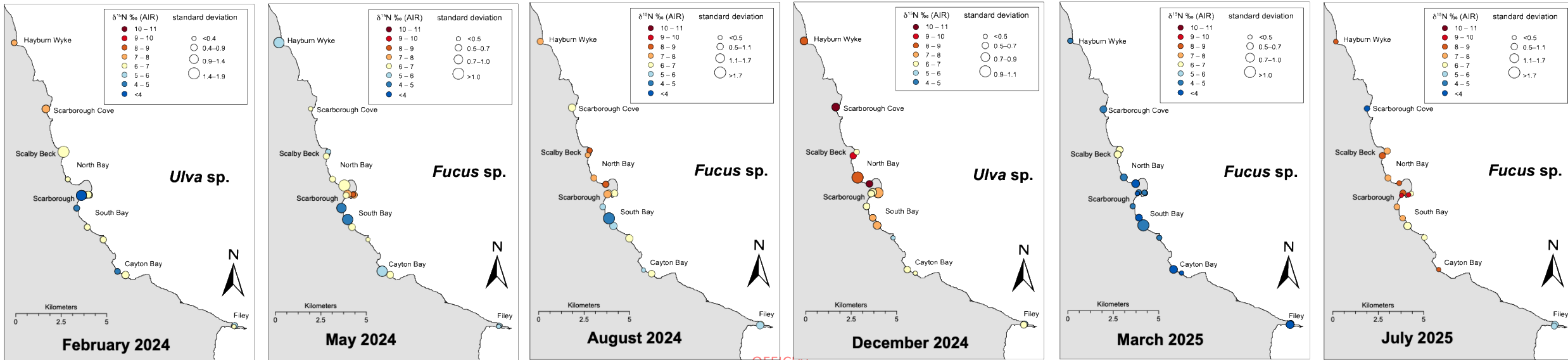
Seaweed  $\delta^{15}\text{N}$  values are consistent with animal manure and sewage (raw and treated)

Elevated  $\delta^{15}\text{N}$  values are dominantly recorded at Scalby Beck and travels southward due to ocean currents

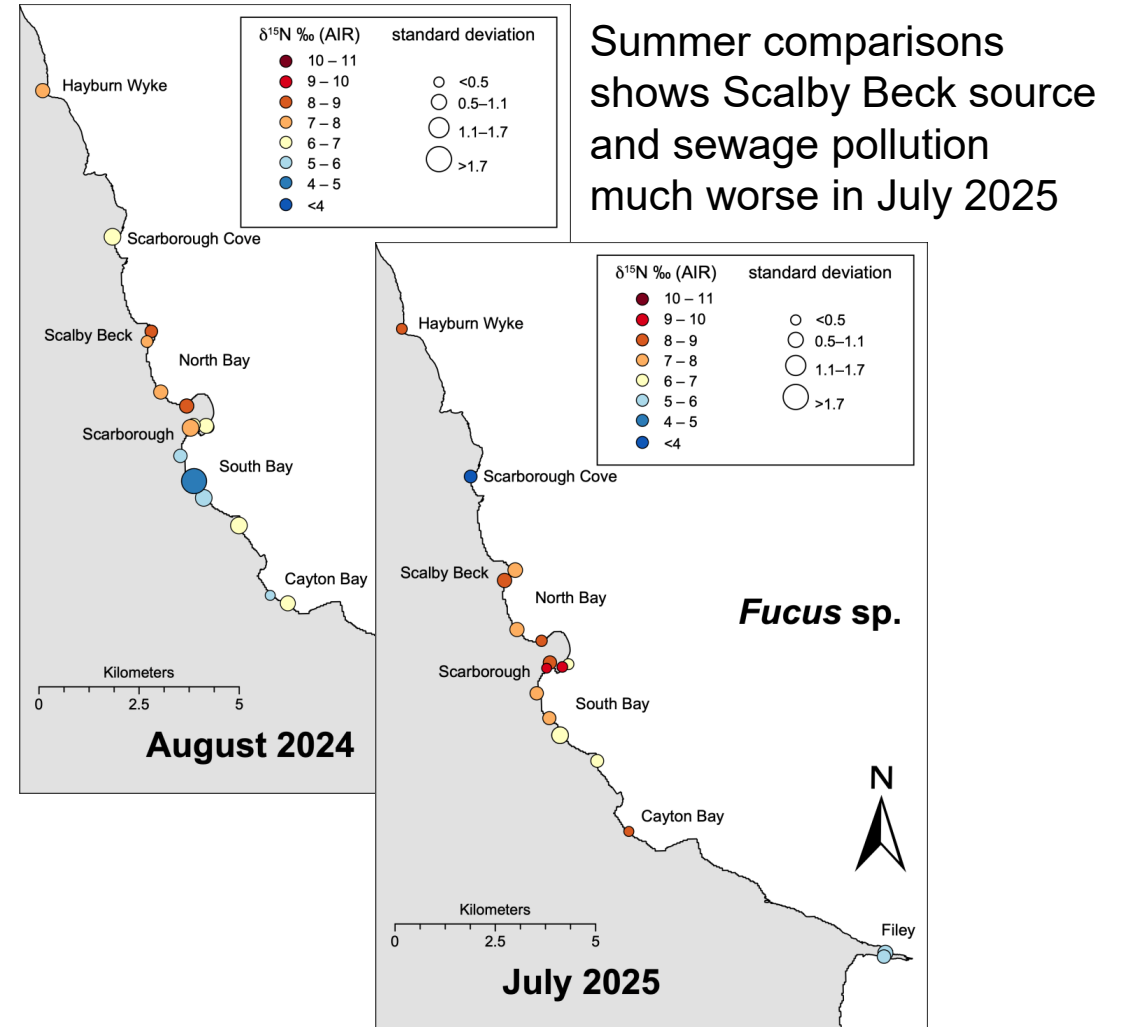
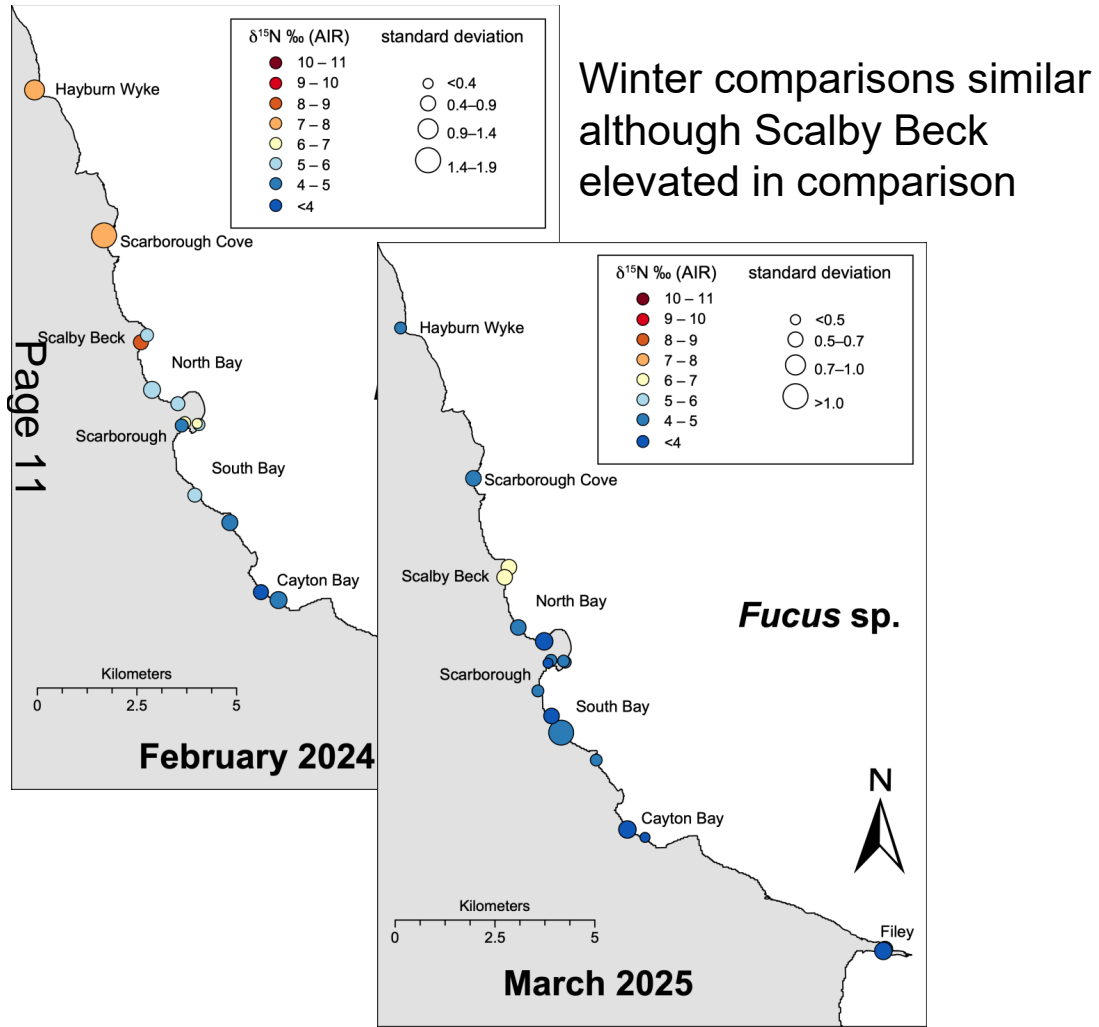
dominant range of  $\delta^{15}\text{N}$  values



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# Scarborough Annual Comparisons



# Scarborough Conclusions...

The data generated over the 2-year study indicate the following:

- $\delta^{15}\text{N}$  values are indicative of animal manure and human sewage
- Data from this study area indicates that Scalby Beck is the source of this pollution
- Ocean currents transport nitrogen pollution from the north to south bay
- $\delta^{15}\text{N}$  indicate no influence from bird guano
- Scalby Beck requires investment to reduce nutrient pollution entering the north bay
- Fertilizer pollution event in June/July 2025 at Scarborough Cove (down to 0–3‰  $\delta^{15}\text{N}$ )

