



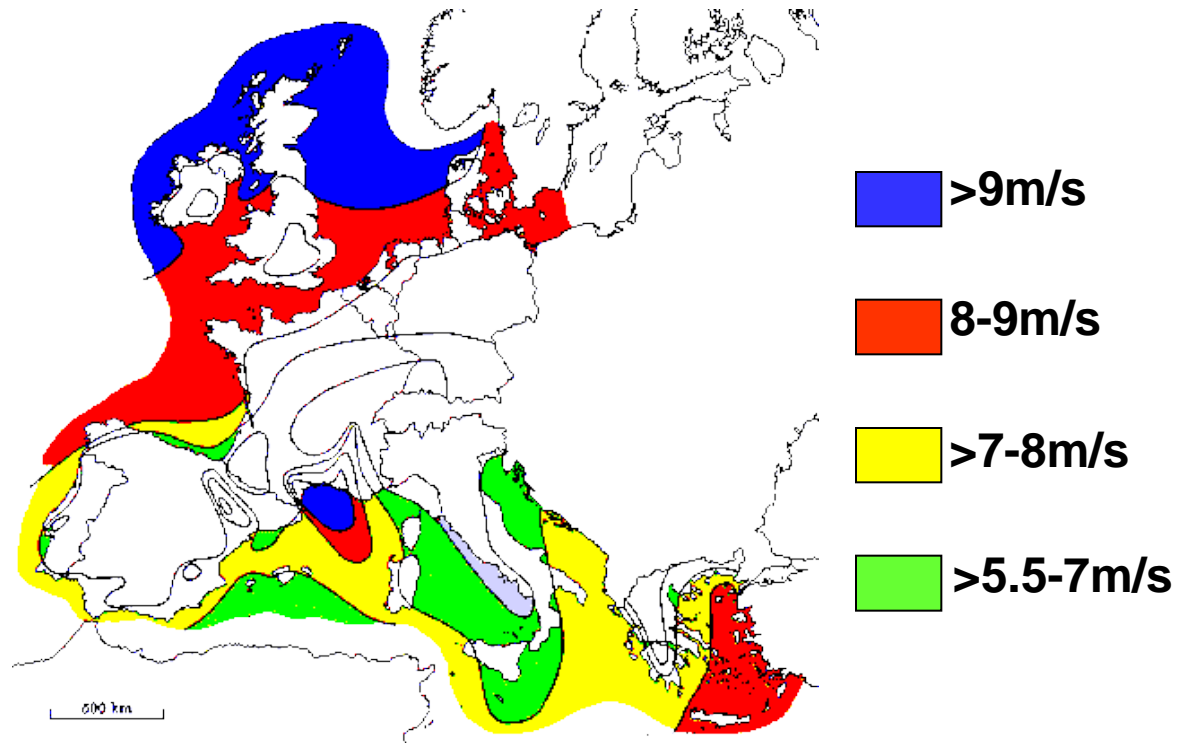
# The Navigational Challenges of Offshore Windfarms

(& other offshore renewal energy projects)

## IUMI Zurich 2010

# Biggest wind resource in Europe

- Huge energy resource
- Combating climate change
- Securing UK energy supplies
- Jobs and investment



Source: renewableUK

# Projects Underway Rounds 1 & 2

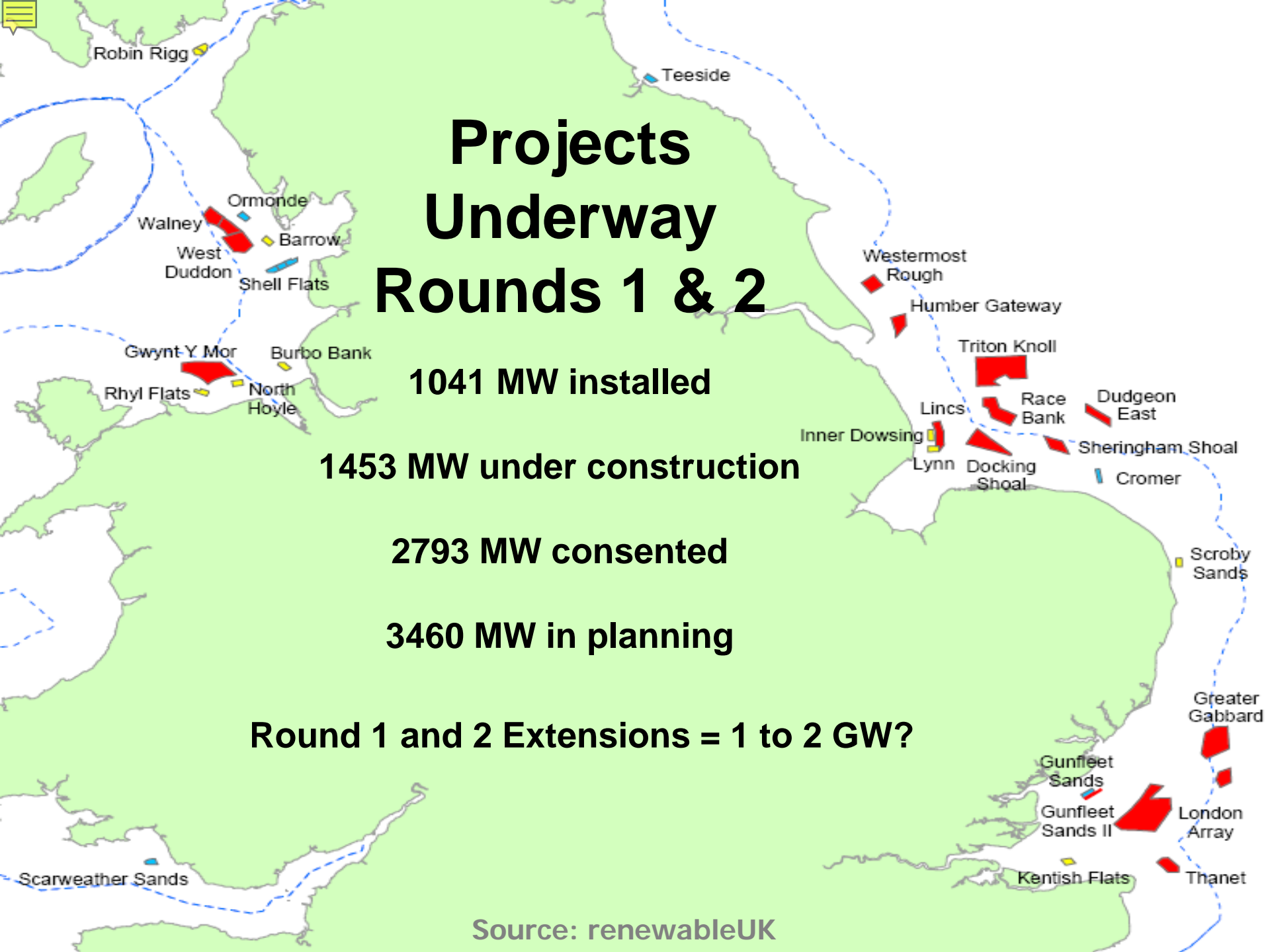
1041 MW installed

1453 MW under construction

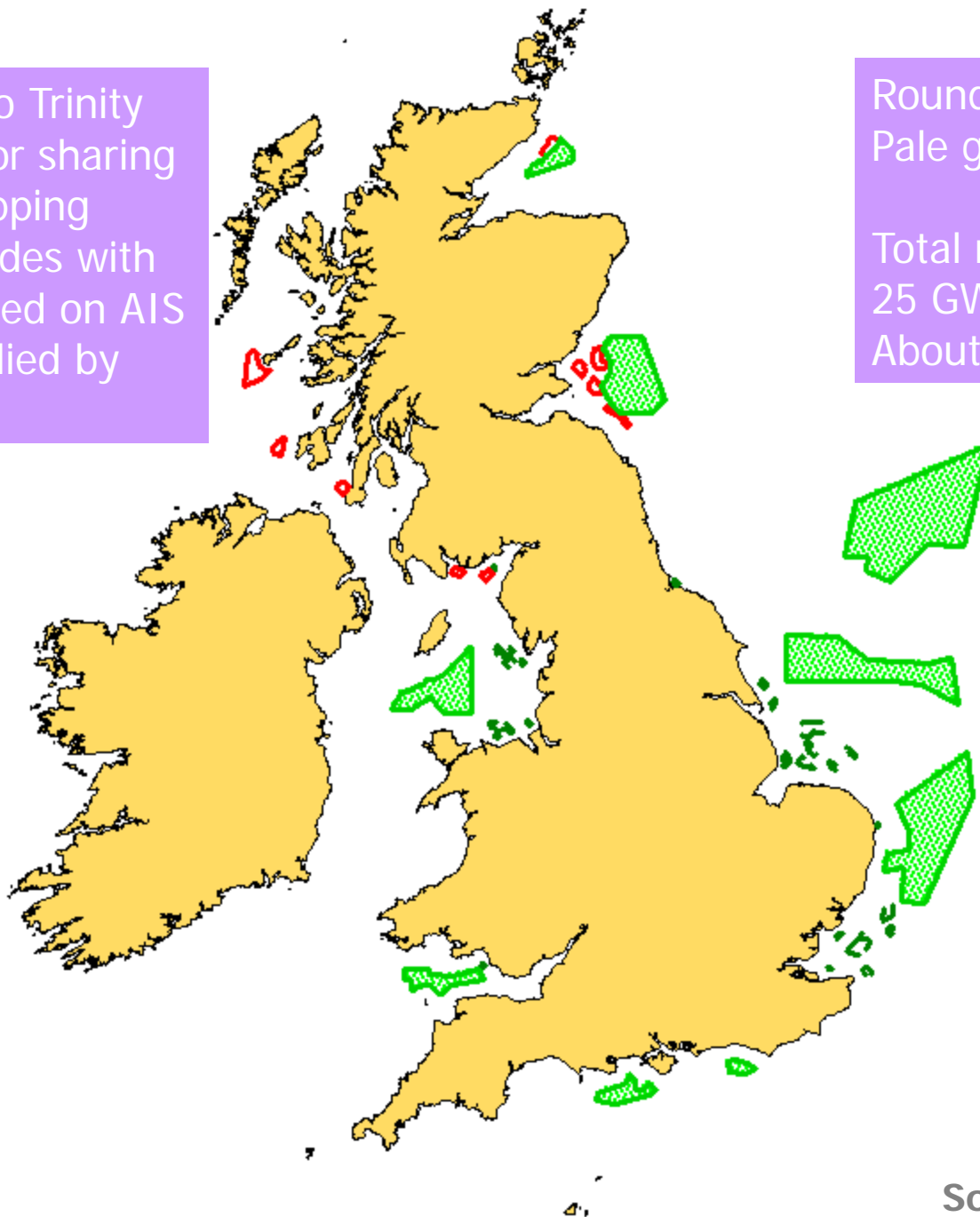
2793 MW consented

3460 MW in planning

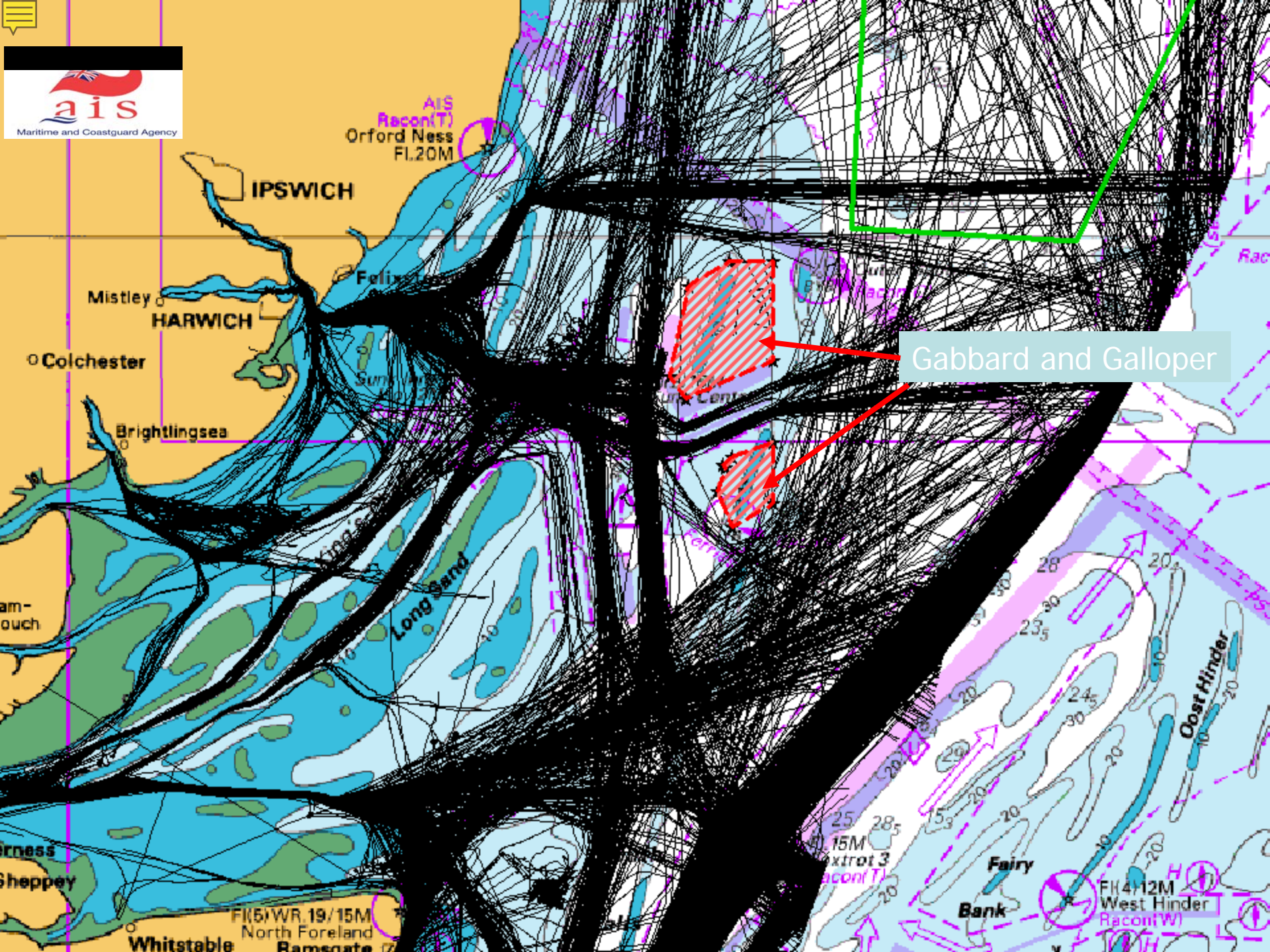
Round 1 and 2 Extensions = 1 to 2 GW?

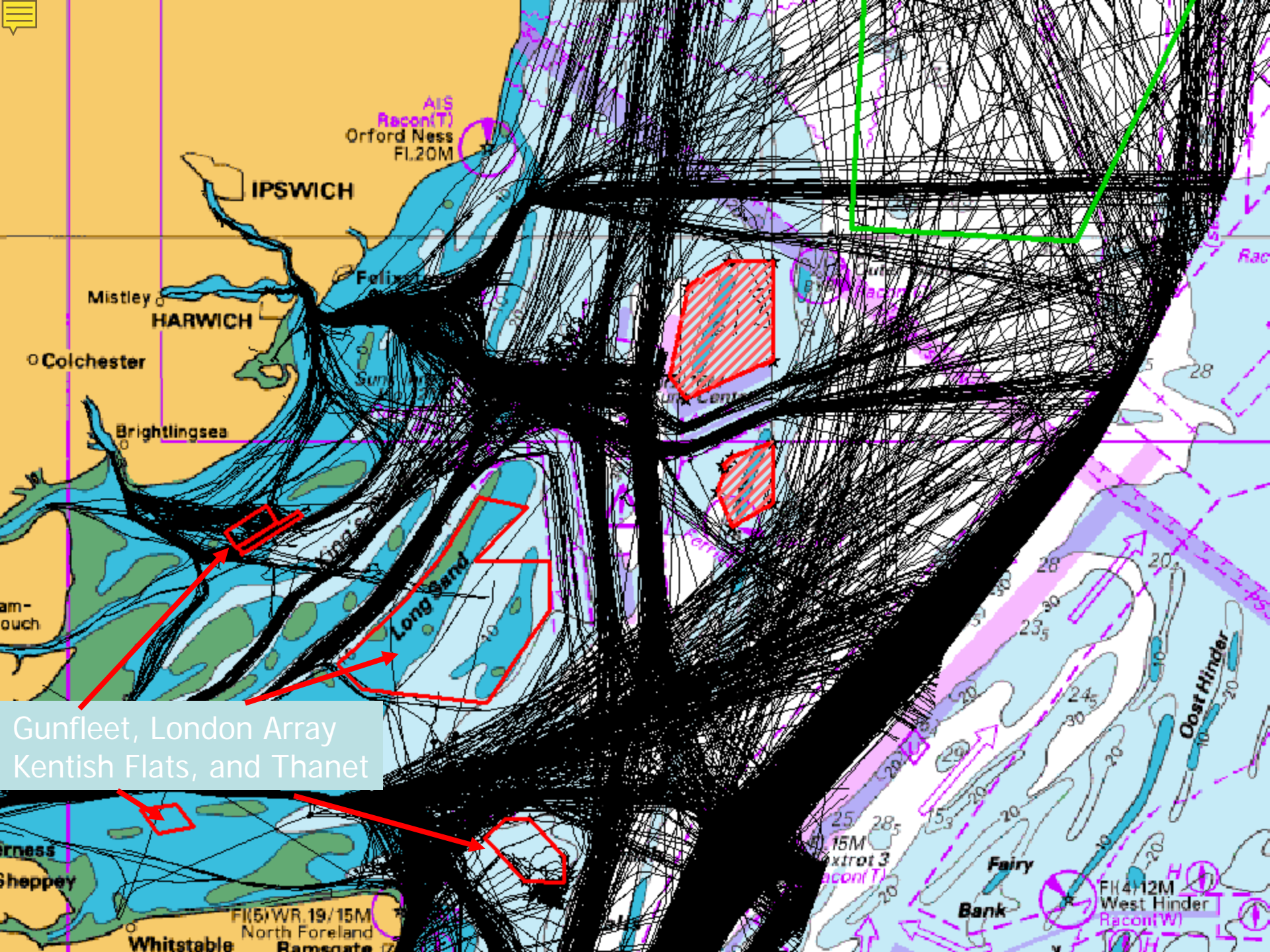


Grateful thanks to Trinity House, London for sharing the following shipping traffic analysis slides with the Institute, based on AIS information supplied by the MCA.

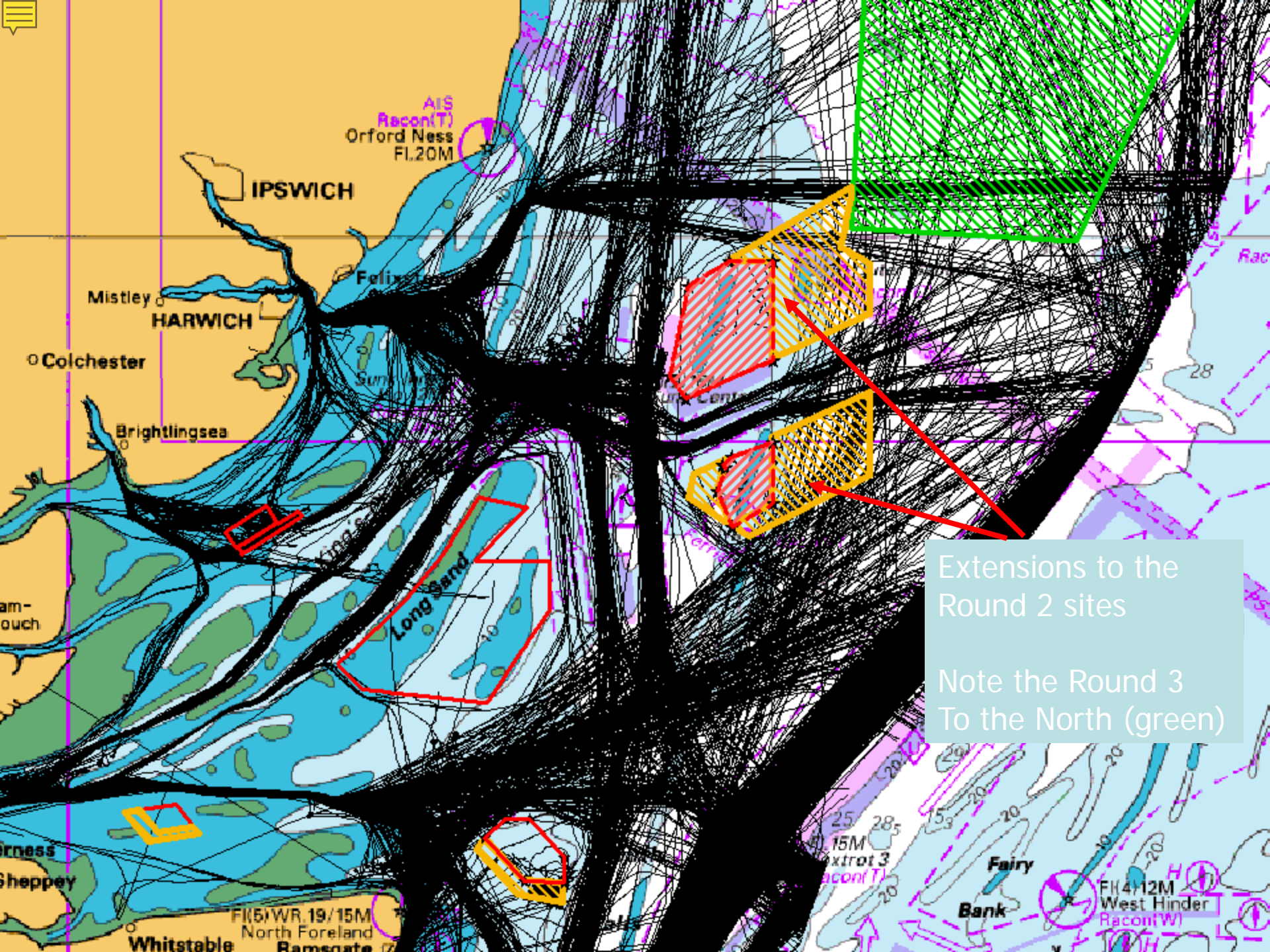


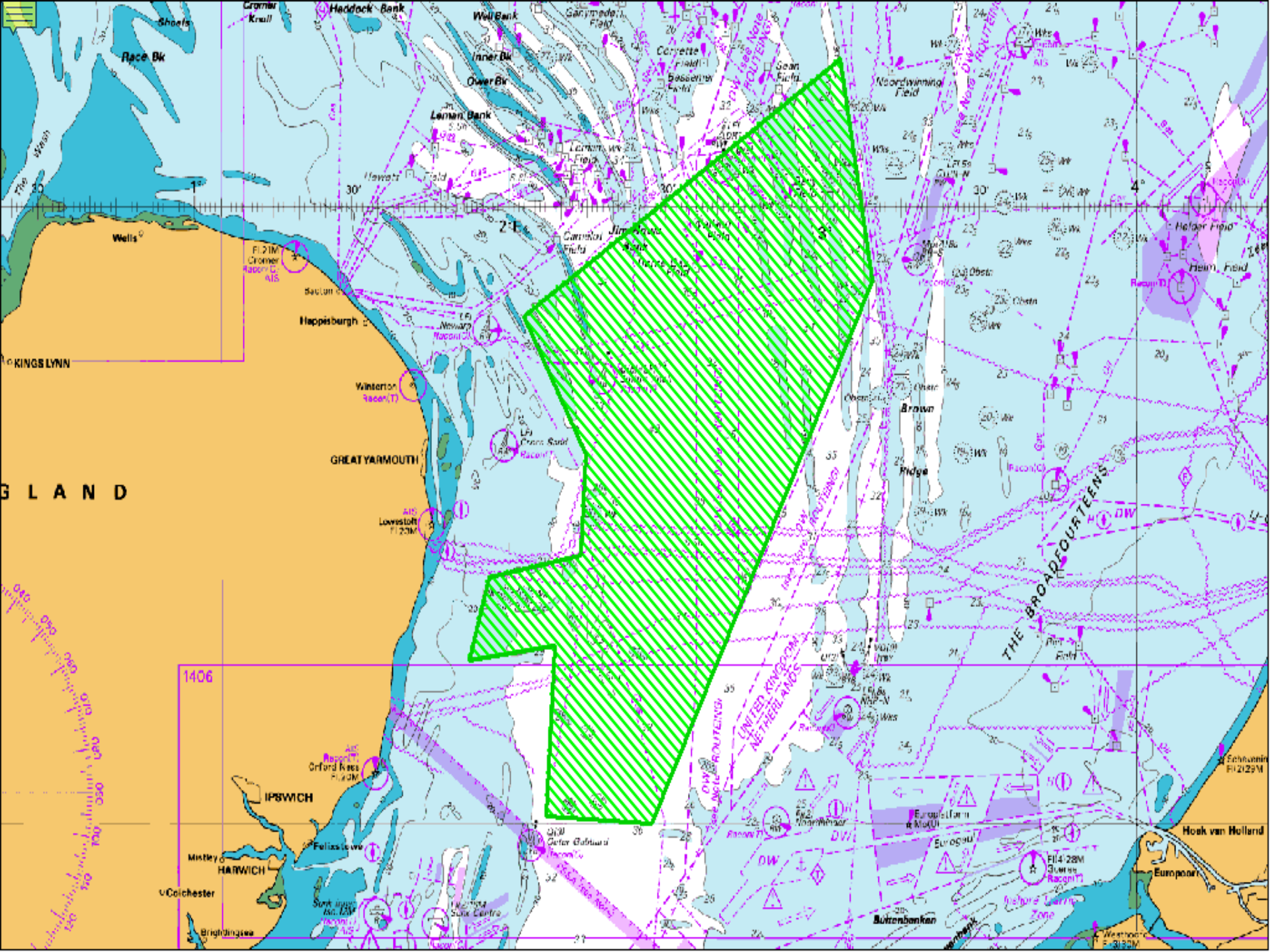
Round 3  
Pale green areas  
  
Total requirement  
25 GW  
About 7000 Turbines



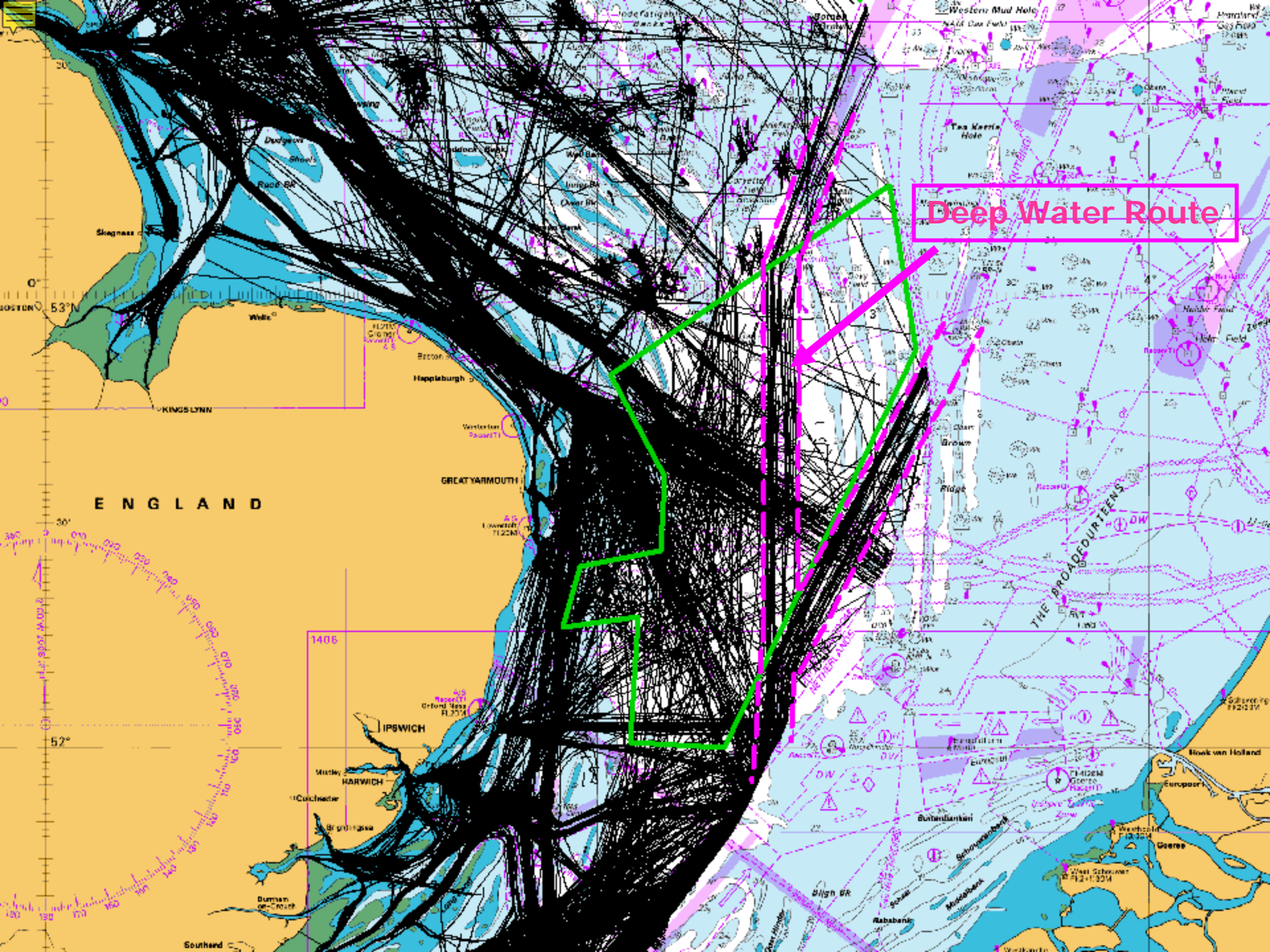


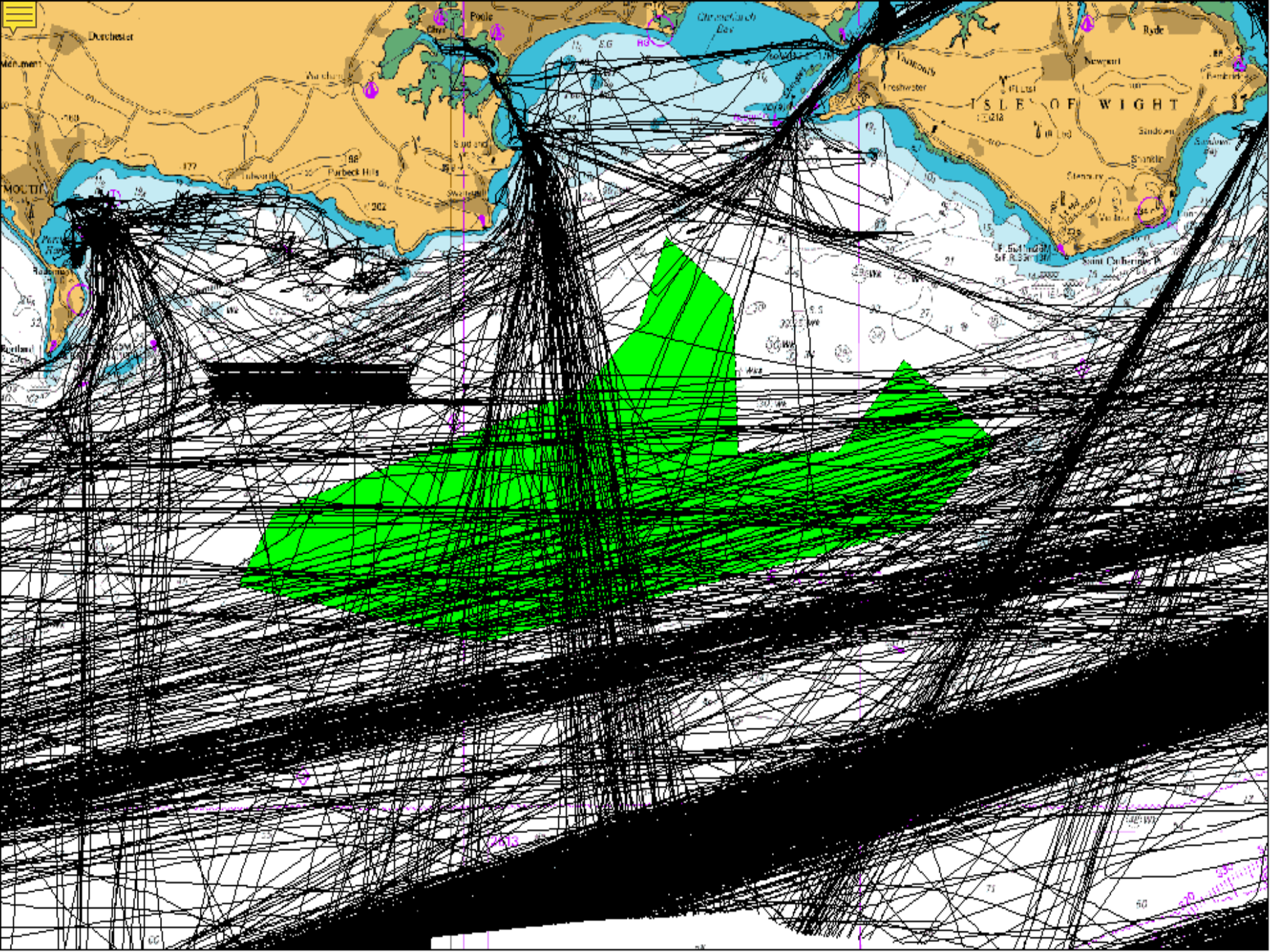




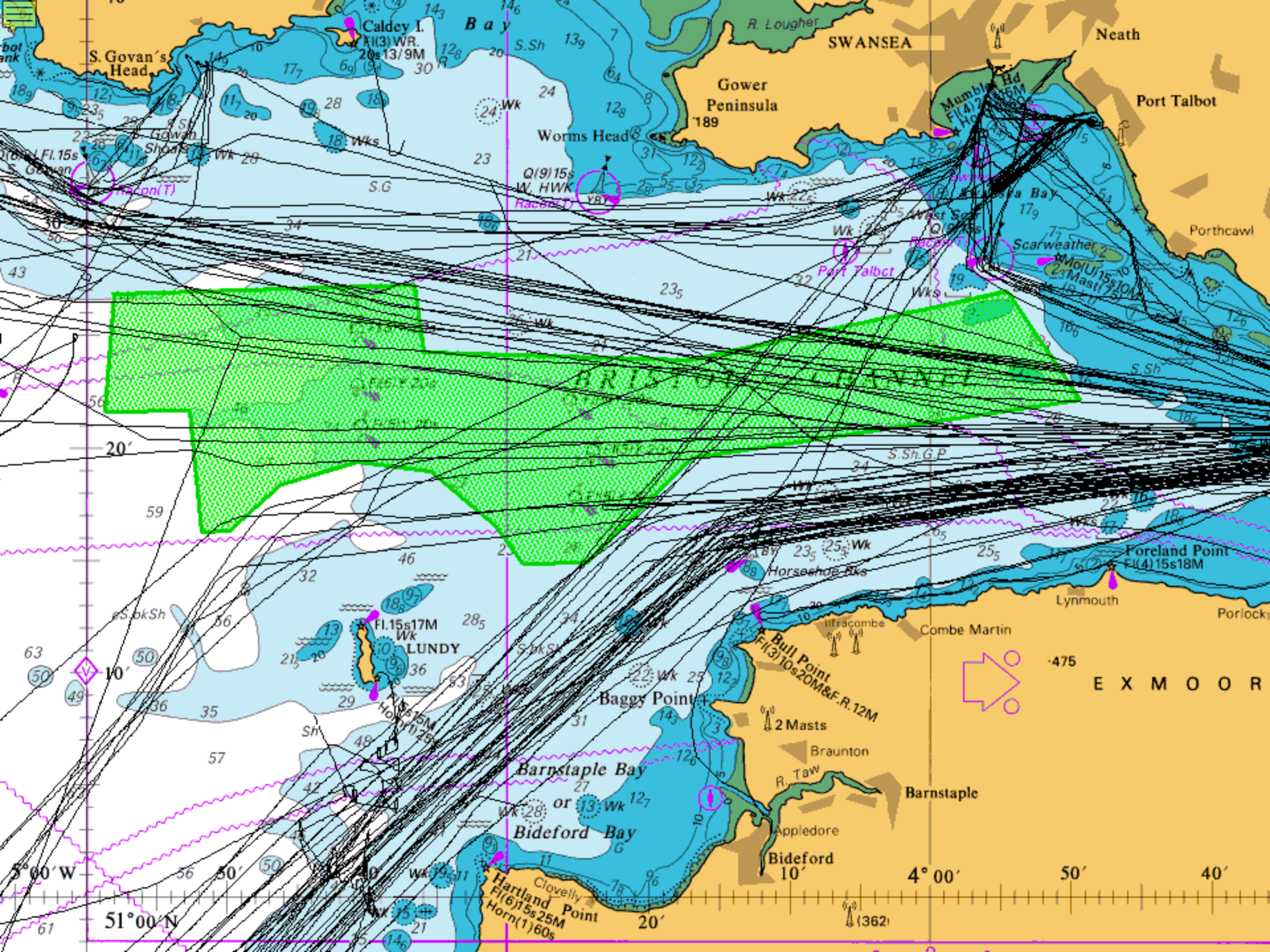


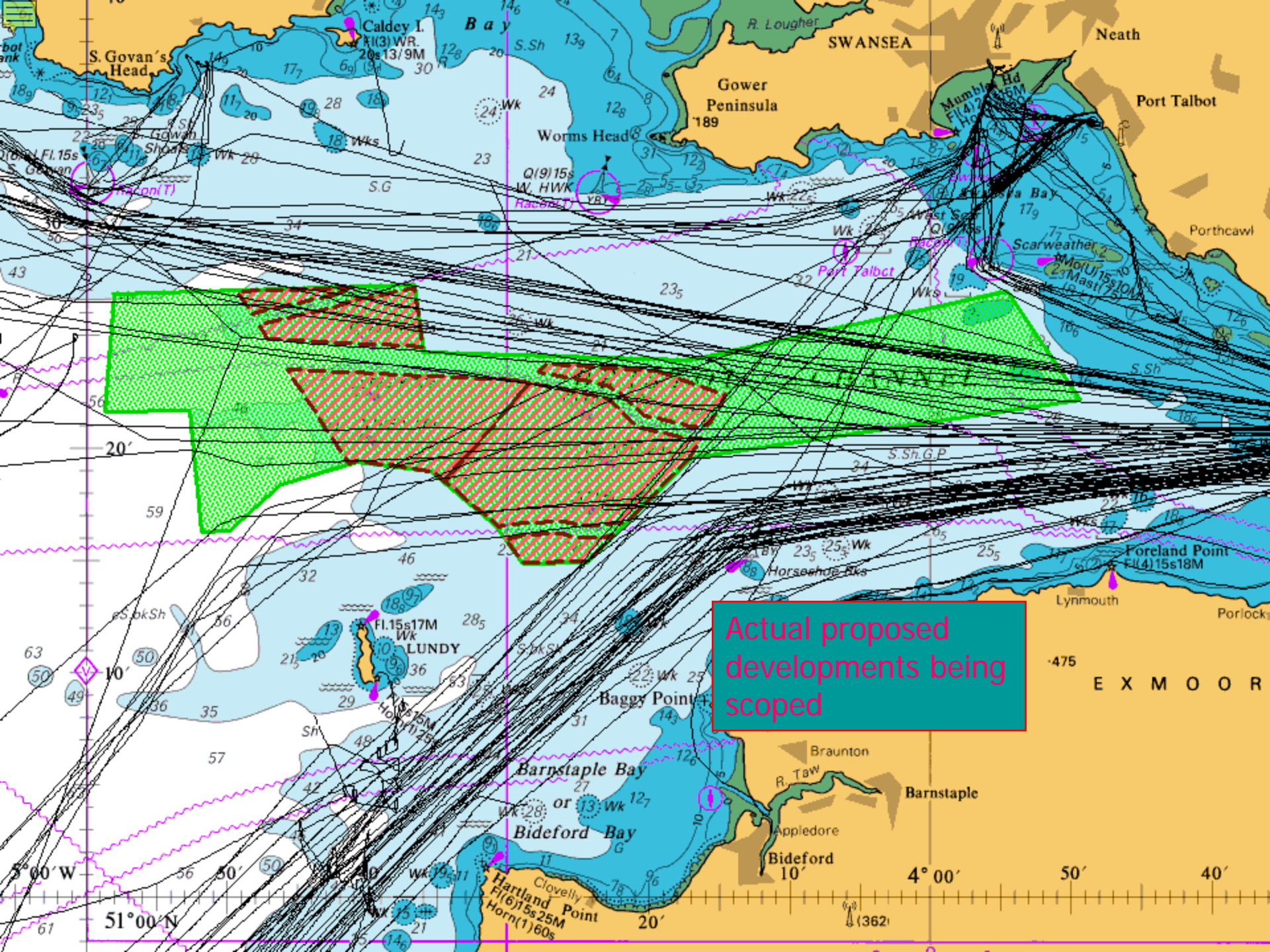






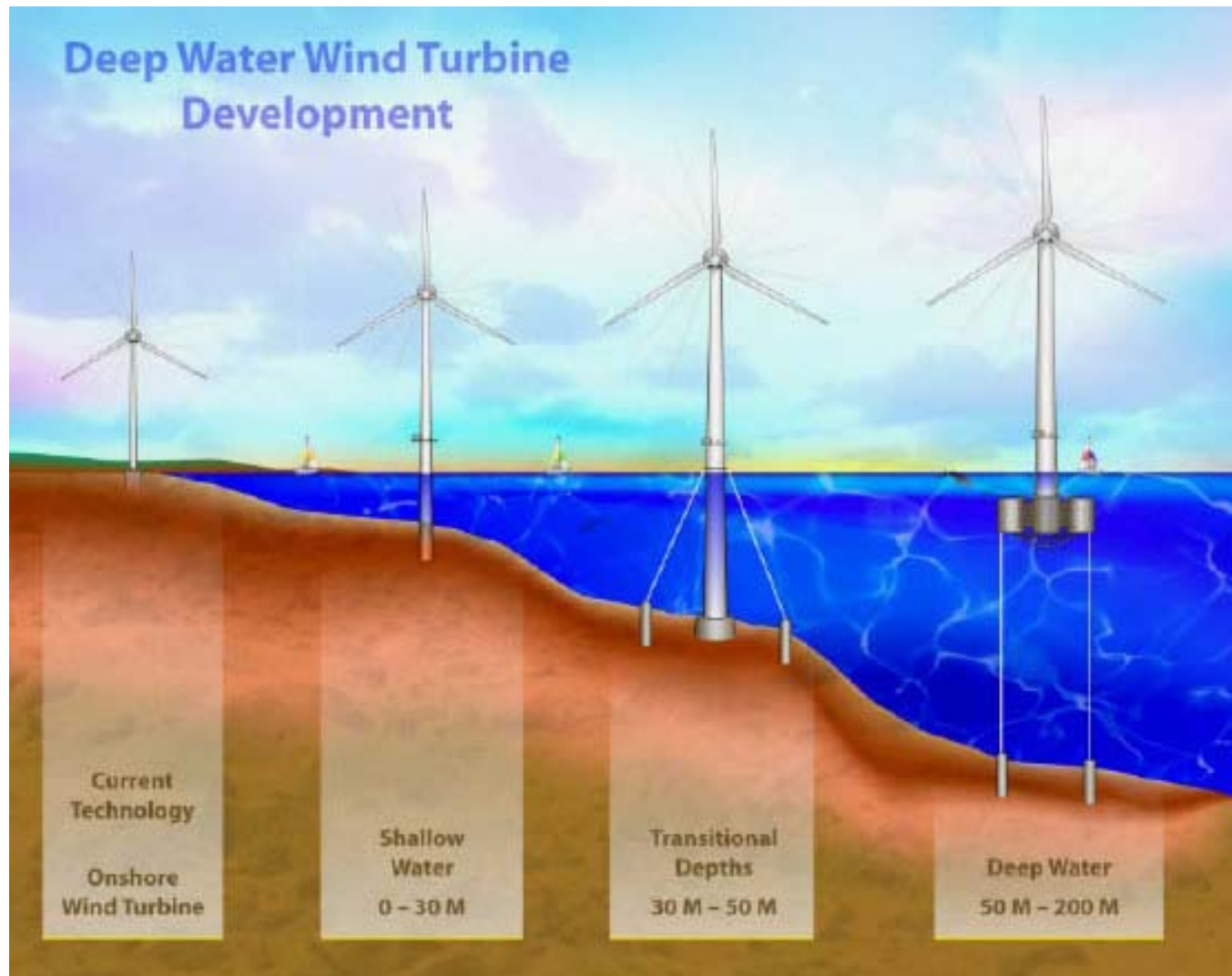








# Technology – Offshore Wind



\*NREL, 2009

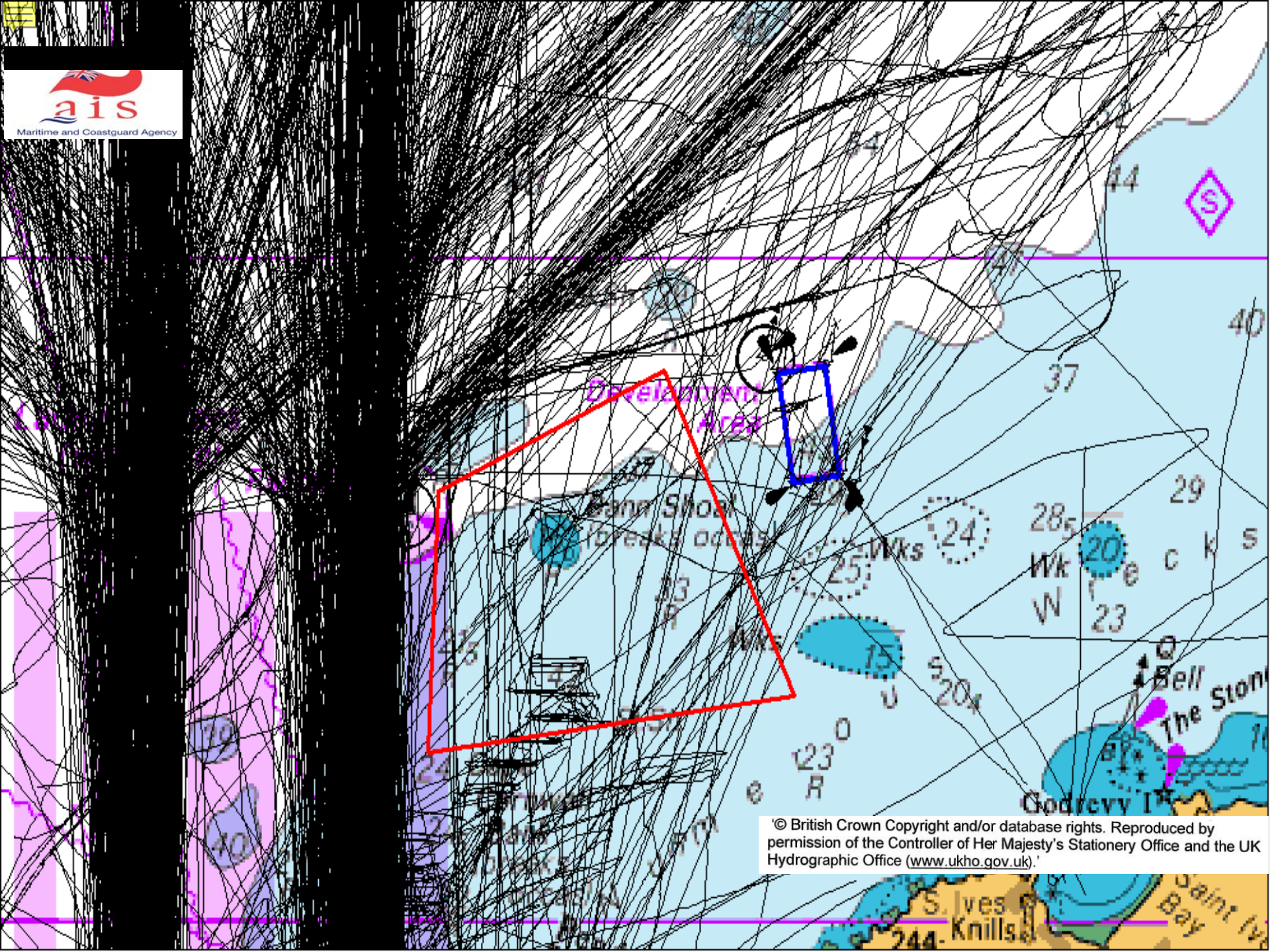
Source: renewableUK



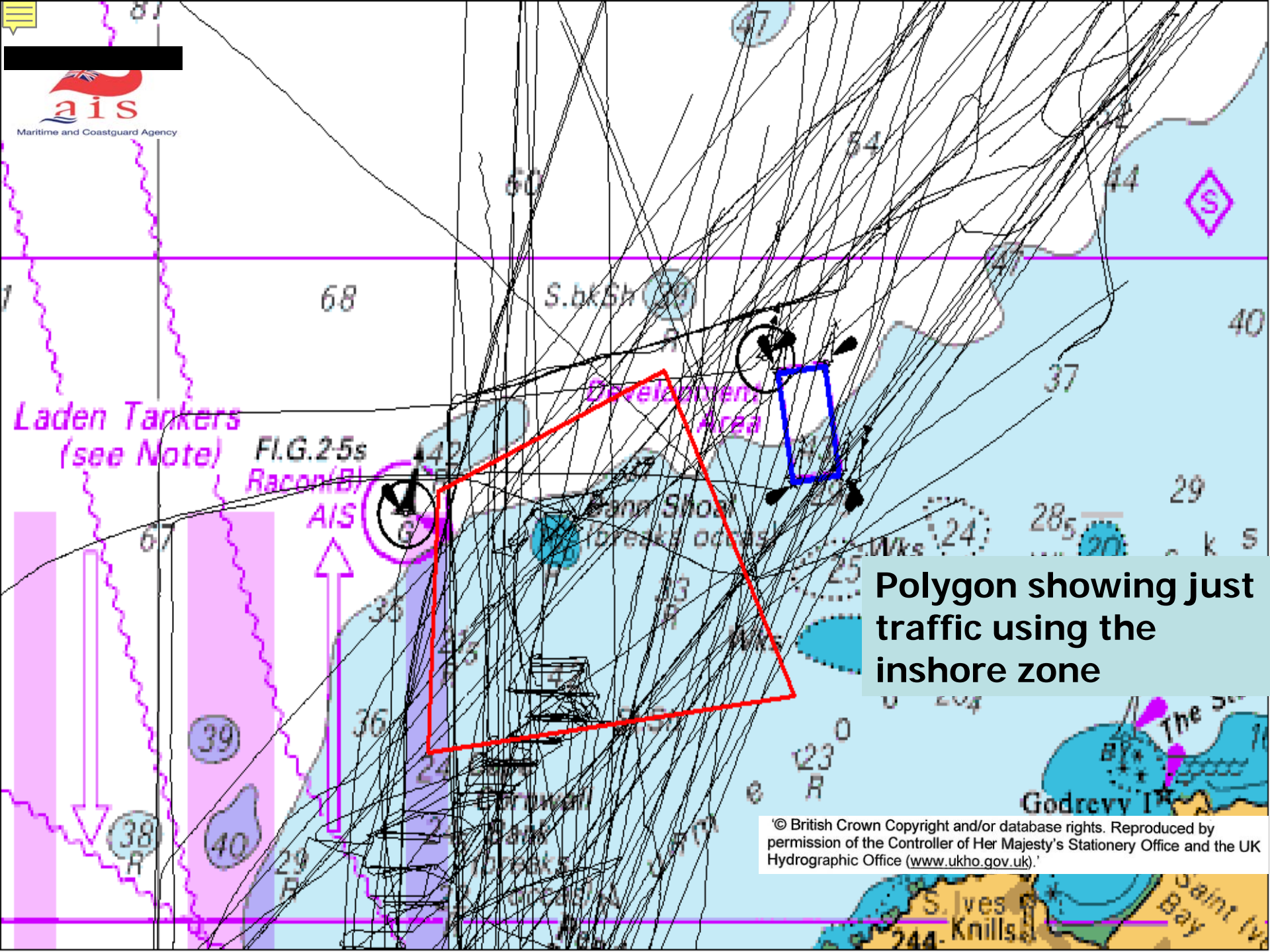


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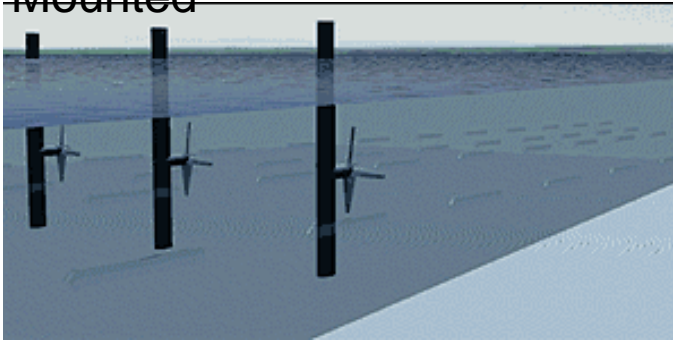




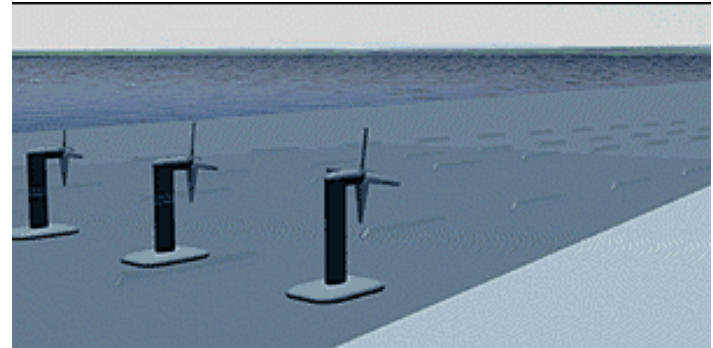
Polygon showing just traffic using the inshore zone

# W&T Foundation Types

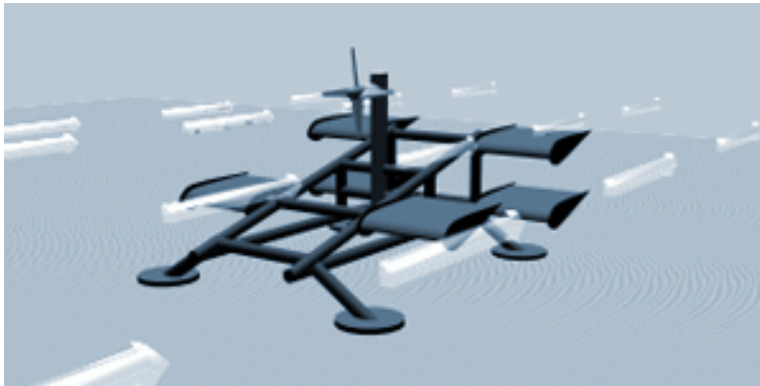
Pile  
Mounted



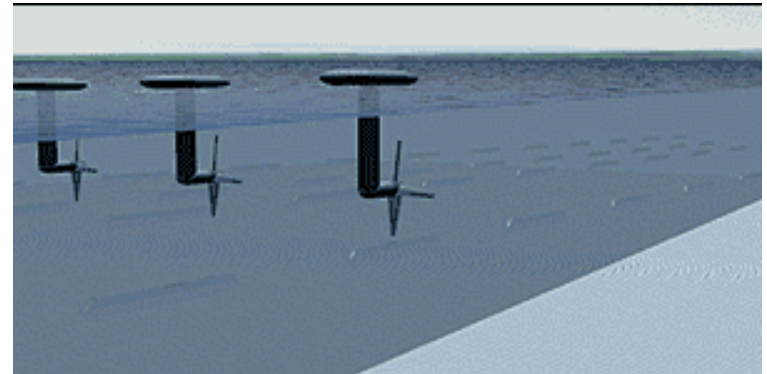
Seabed Mounted or Gravity Base



Hydrofoil Inducing Downforce



Floating

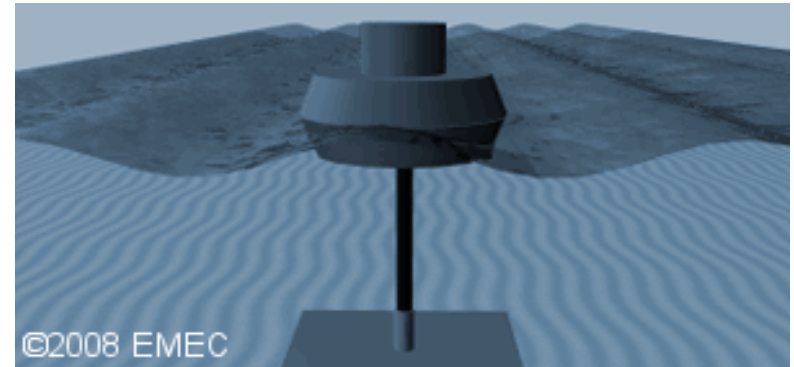


# Tidal stream Types & Wave Devices

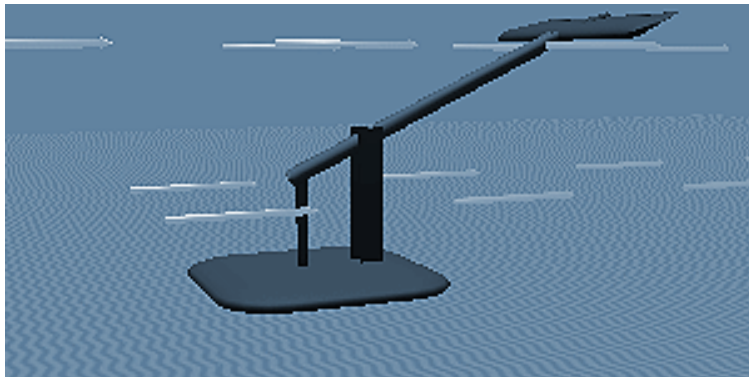
Horizontal axis turbine (Enclosed Tips)



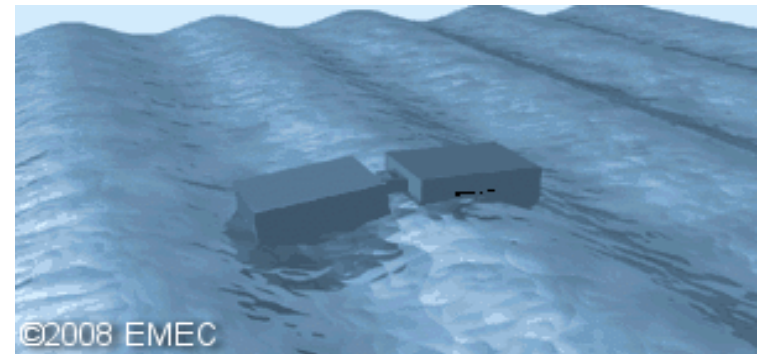
Point absorber



Oscillating Hydrofoil



Attenuator





## Challenges Summary

- Restriction of shipping routes
- Construction phase risks
- Aids to navigation marking and maintenance
- Dissemination of navigational information
- Education of mariners on hazards
- Decommissioning of sites – residual risks