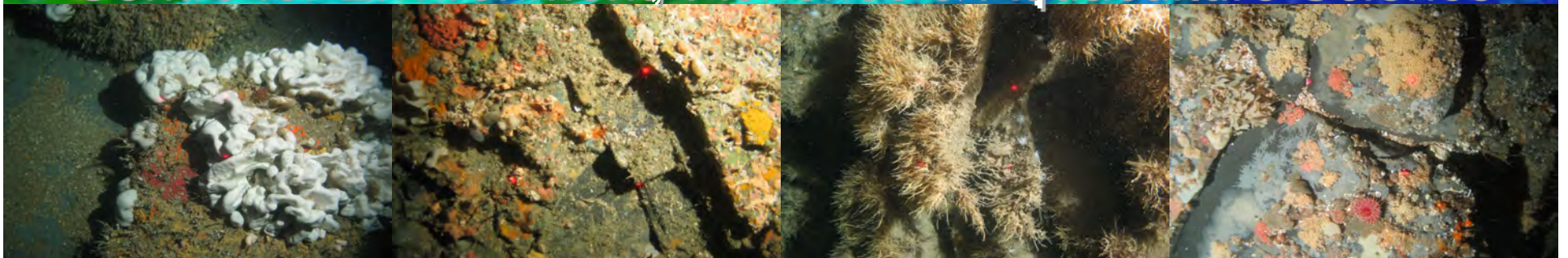


How can we predict the occurrence of rocky reefs?

Markus Dìesing, John Aldridge and Roger Coggan
Centre for Environment, Fisheries & Aquaculture Science



Natura 2000 network

- Founded on two pieces of legislation:
1979 Birds Directive and 1992 Habitats Directive
- 800,000 km² of land area and 100,000 km² of marine environment covered by the Natura 2000 network
- Purpose of the network is to preserve terrestrial, freshwater and marine biological diversity
- Annexes to the Habitats Directive list various habitat types and species for whose conservation special efforts need to be undertaken EU-wide

Annex I habitats

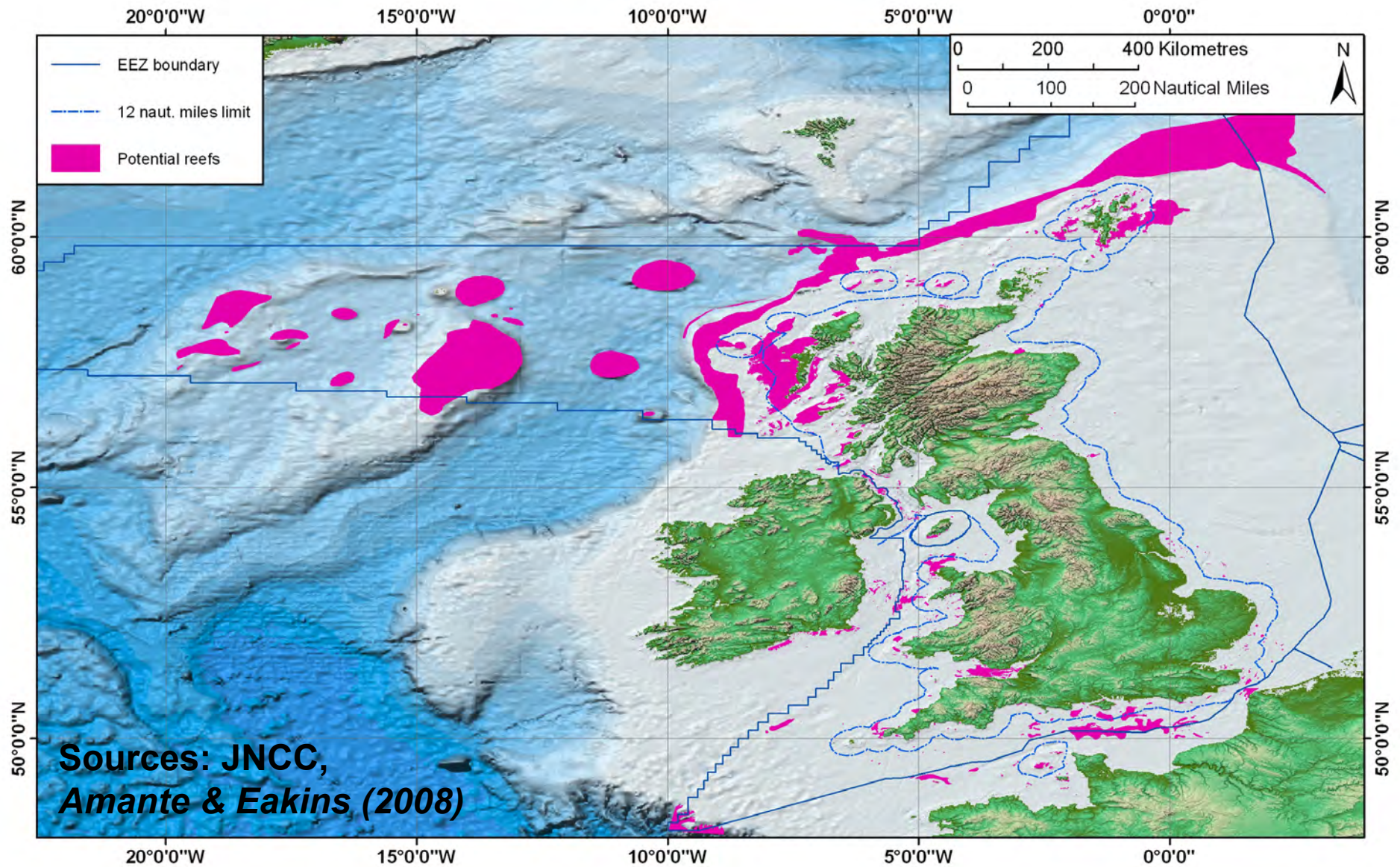
In UK offshore waters (12 – 200 nautical miles):

- Sandbanks which are slightly covered by sea water all the time
- **Reefs**
- Submarine structures made by leaking gases

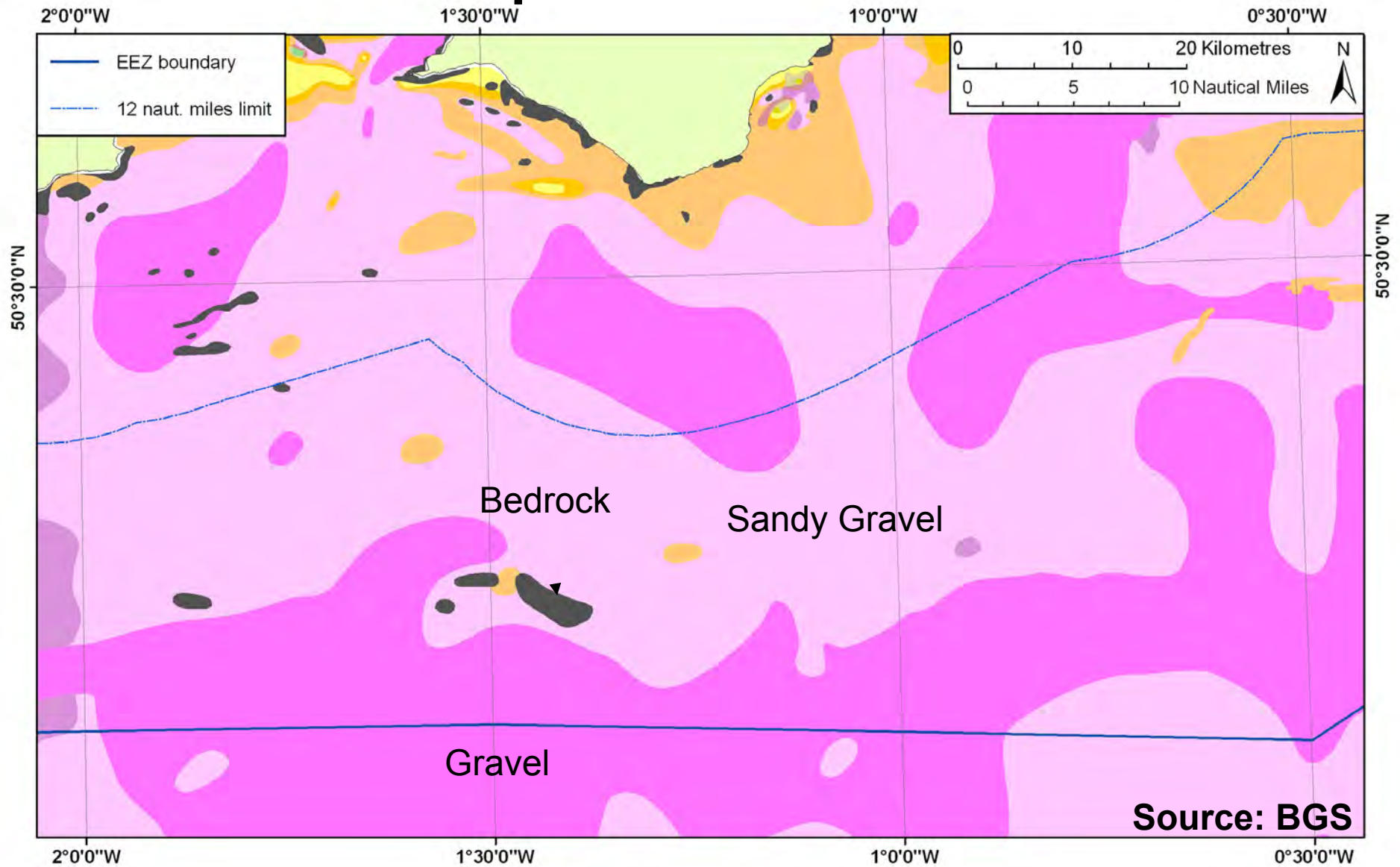
Reefs

- “Reefs can be either **biogenic concretions** or of **geogenic origin**. They are hard compact substrata on solid and soft bottoms, which arise from the sea floor in the sublittoral and littoral zone.” (Interpretation Manual)
- Reef sub-types:
 - Biogenic reef (cold-water corals, worm reefs and mussel beds)
 - “Stony” reef (immobile cobble and boulder)
 - **Bedrock**

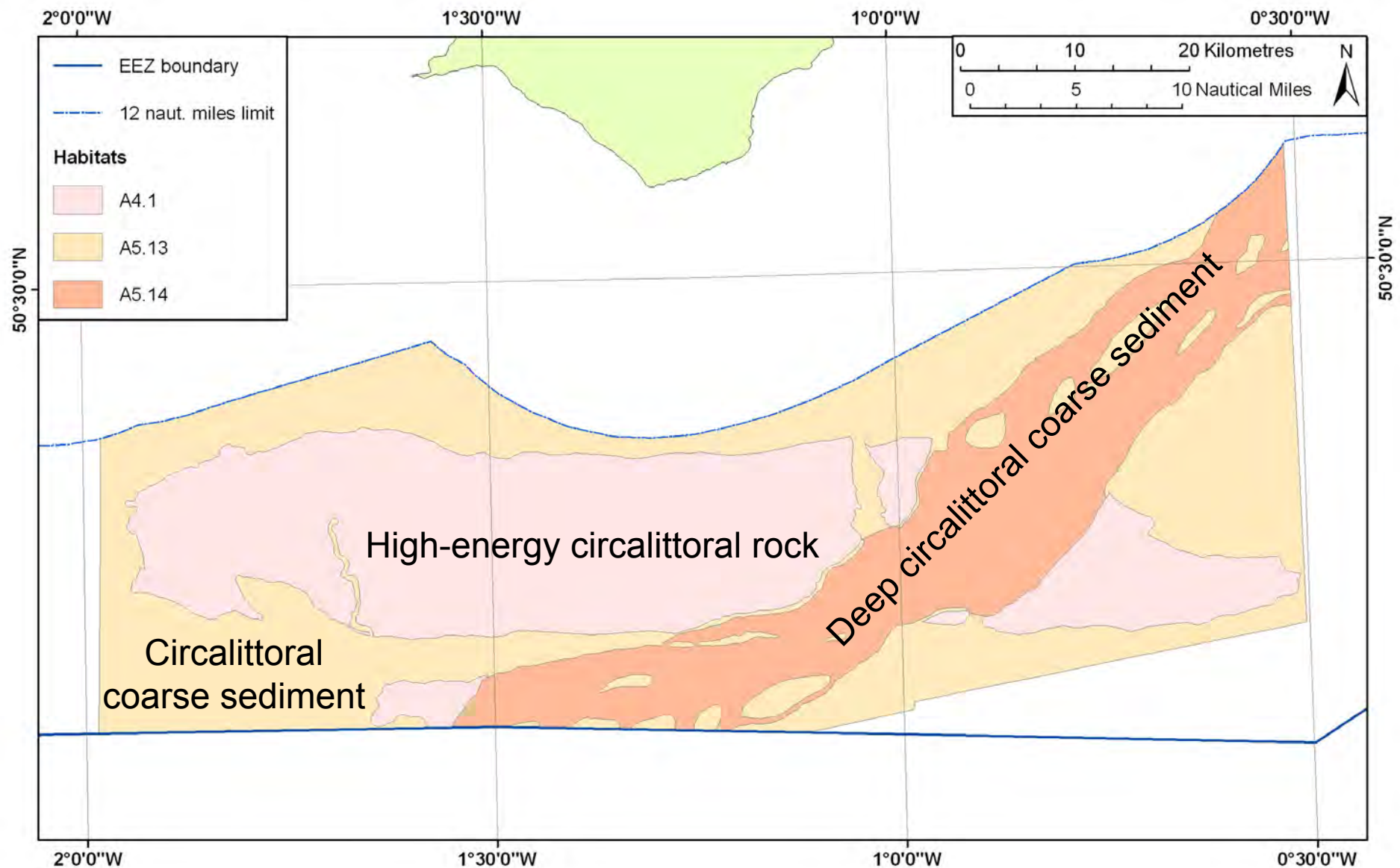
Areas of Search



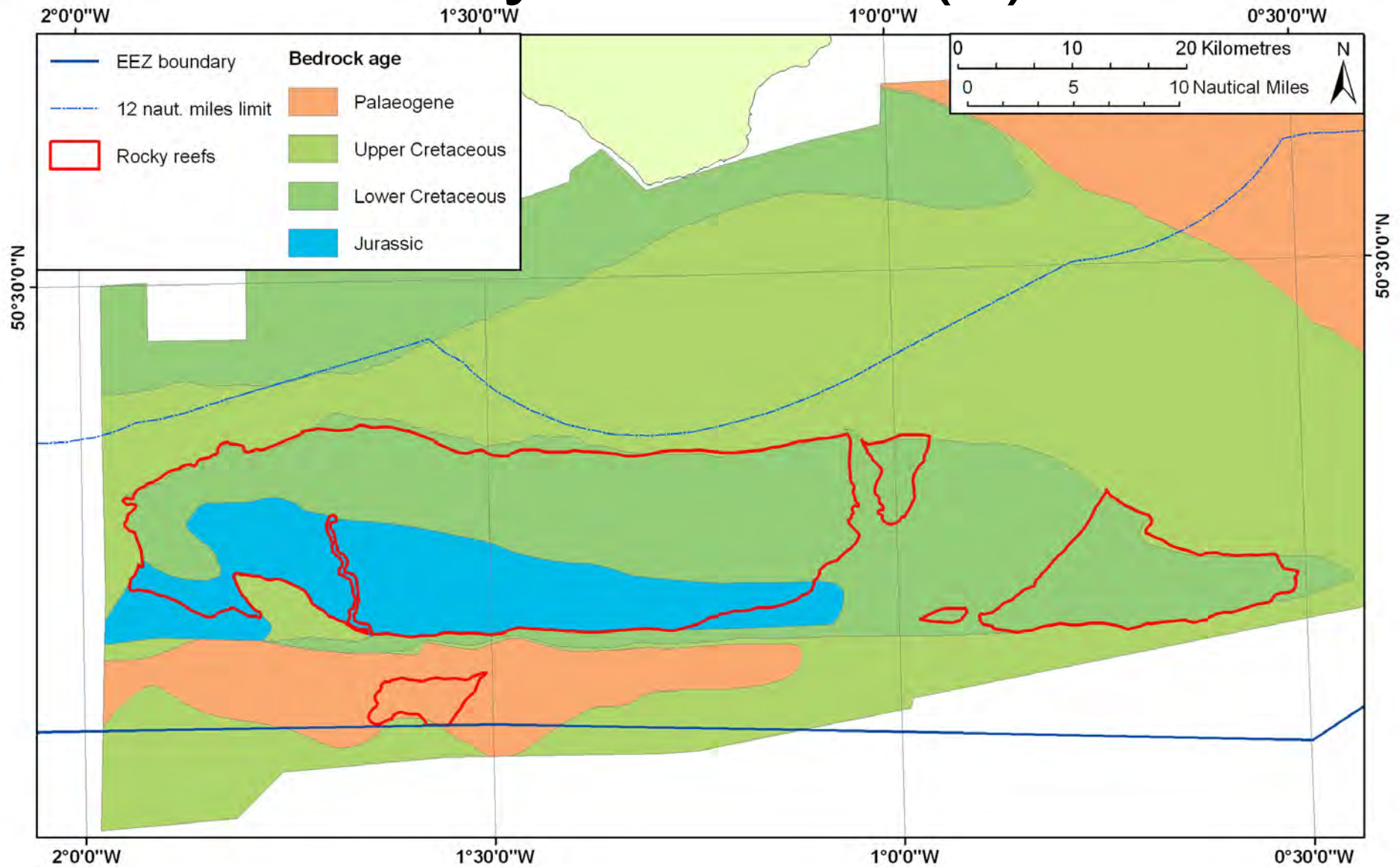
Expectations...



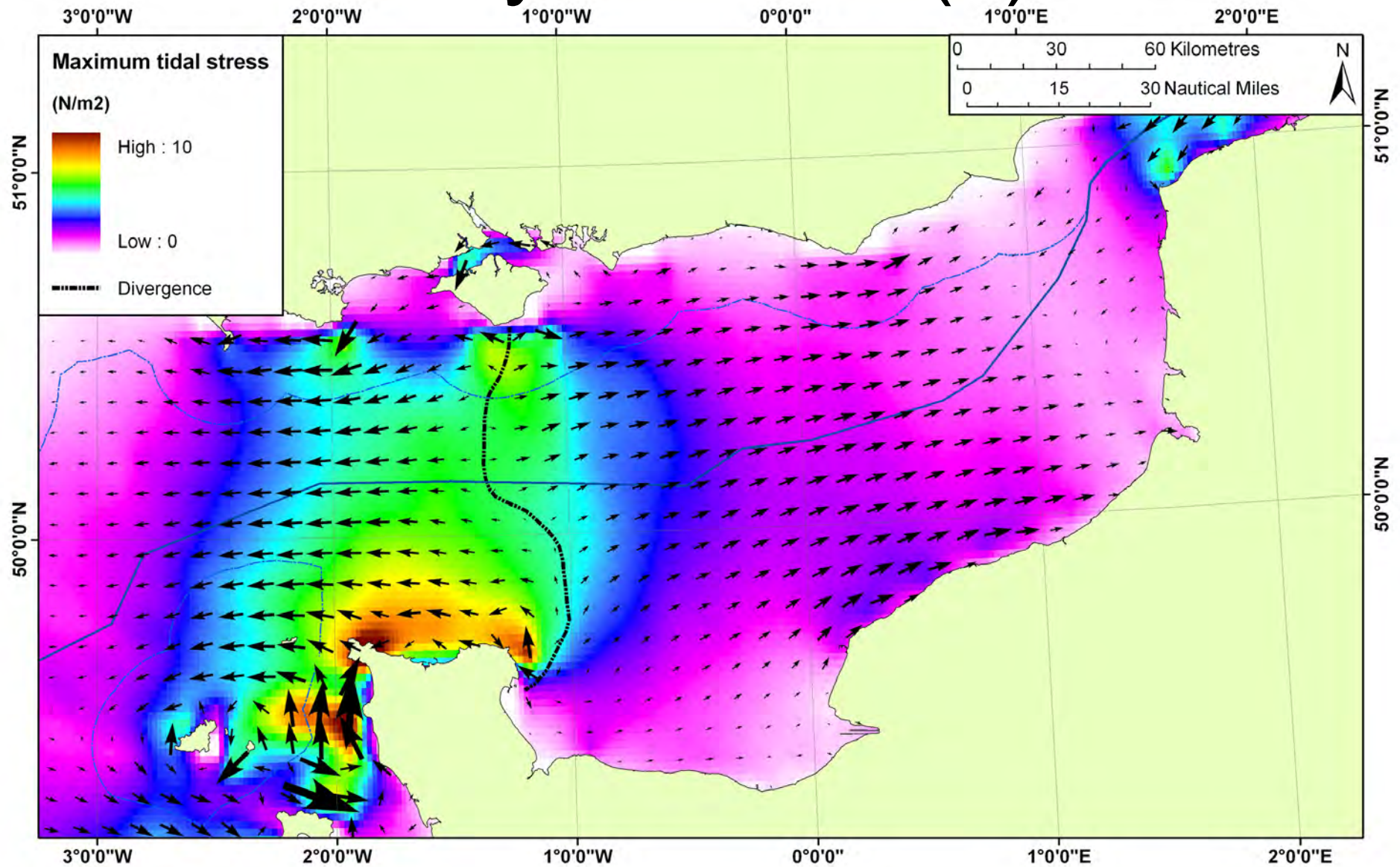
...and what we found



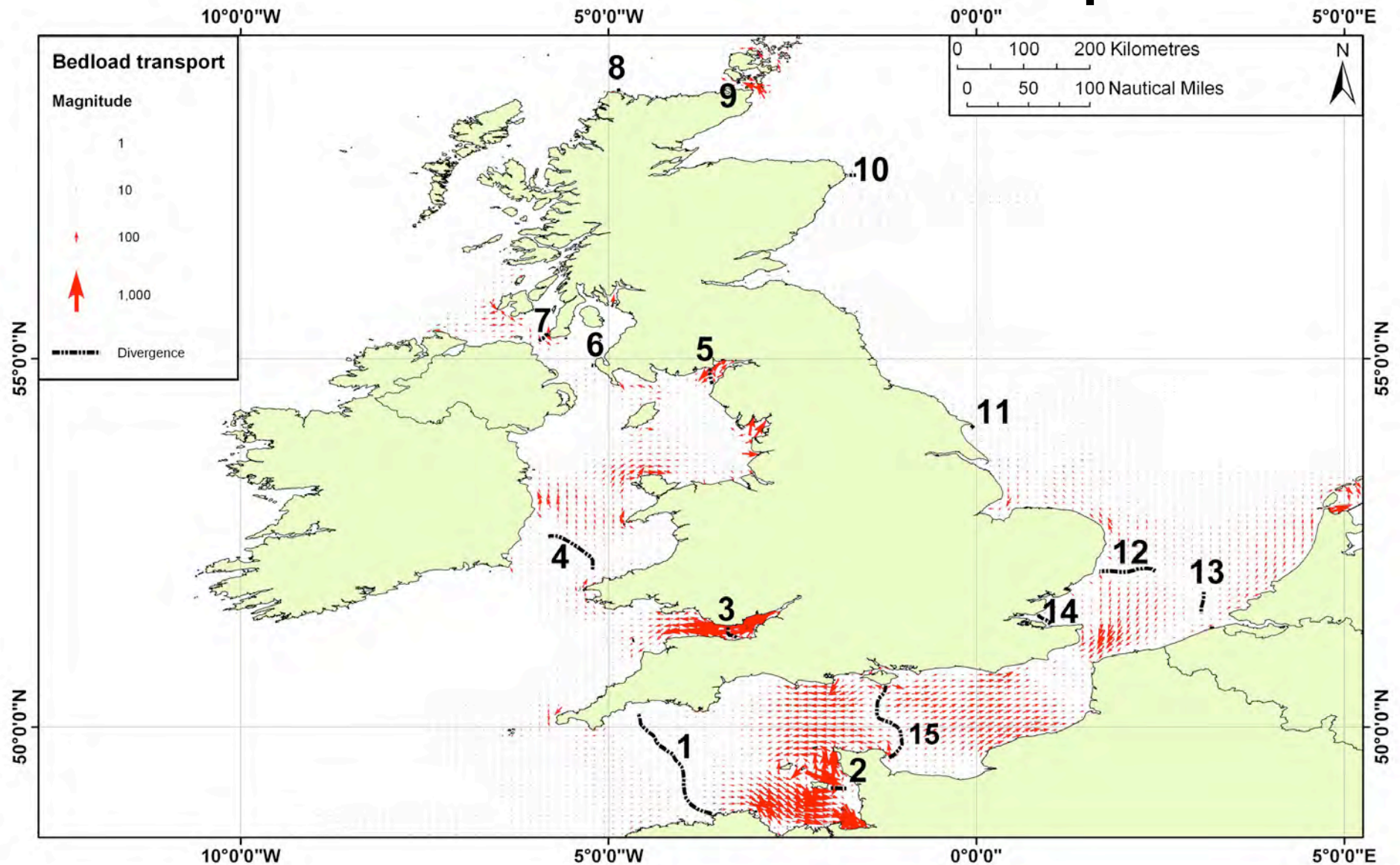
Why it's there (1)



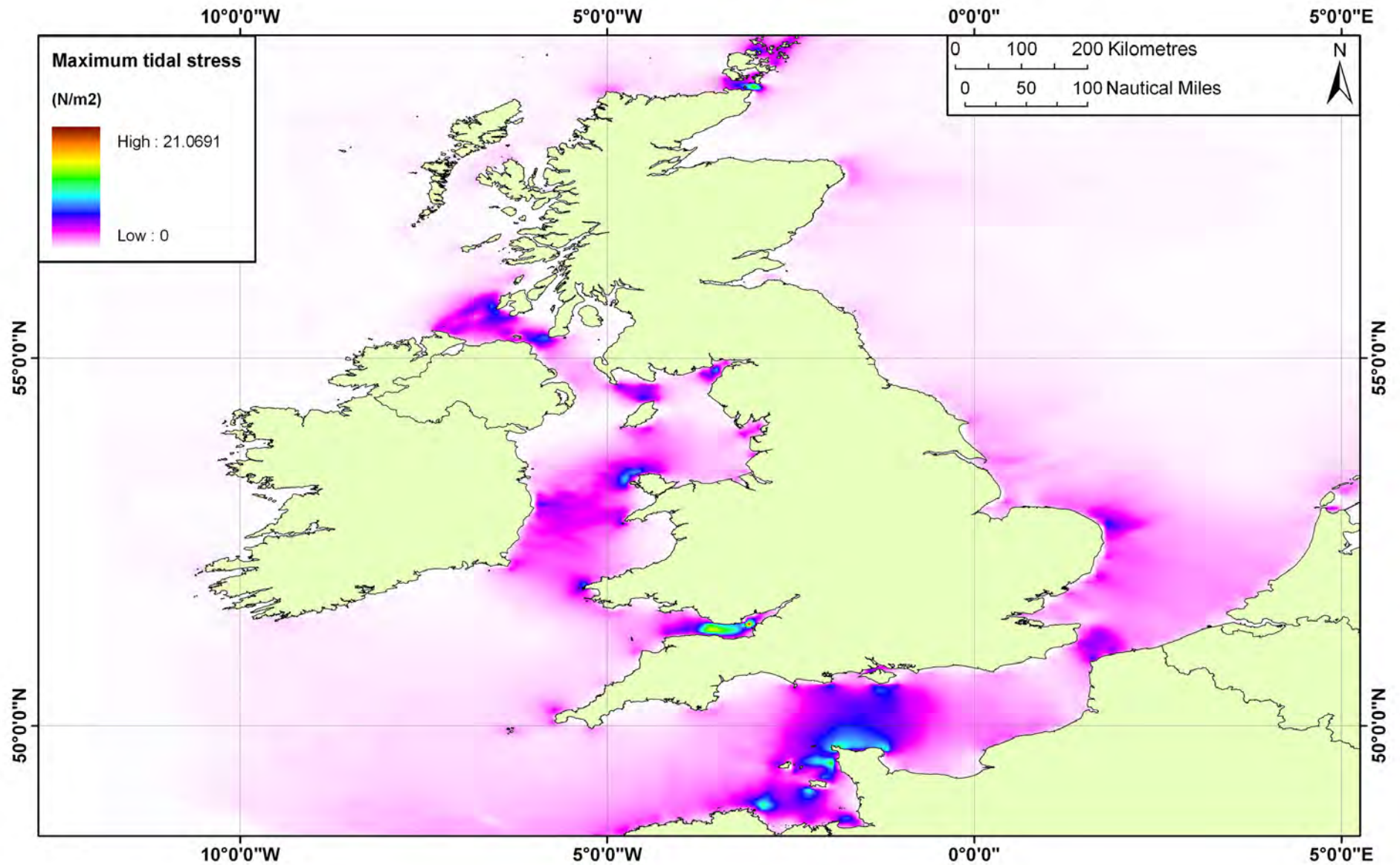
Why it's there (2)



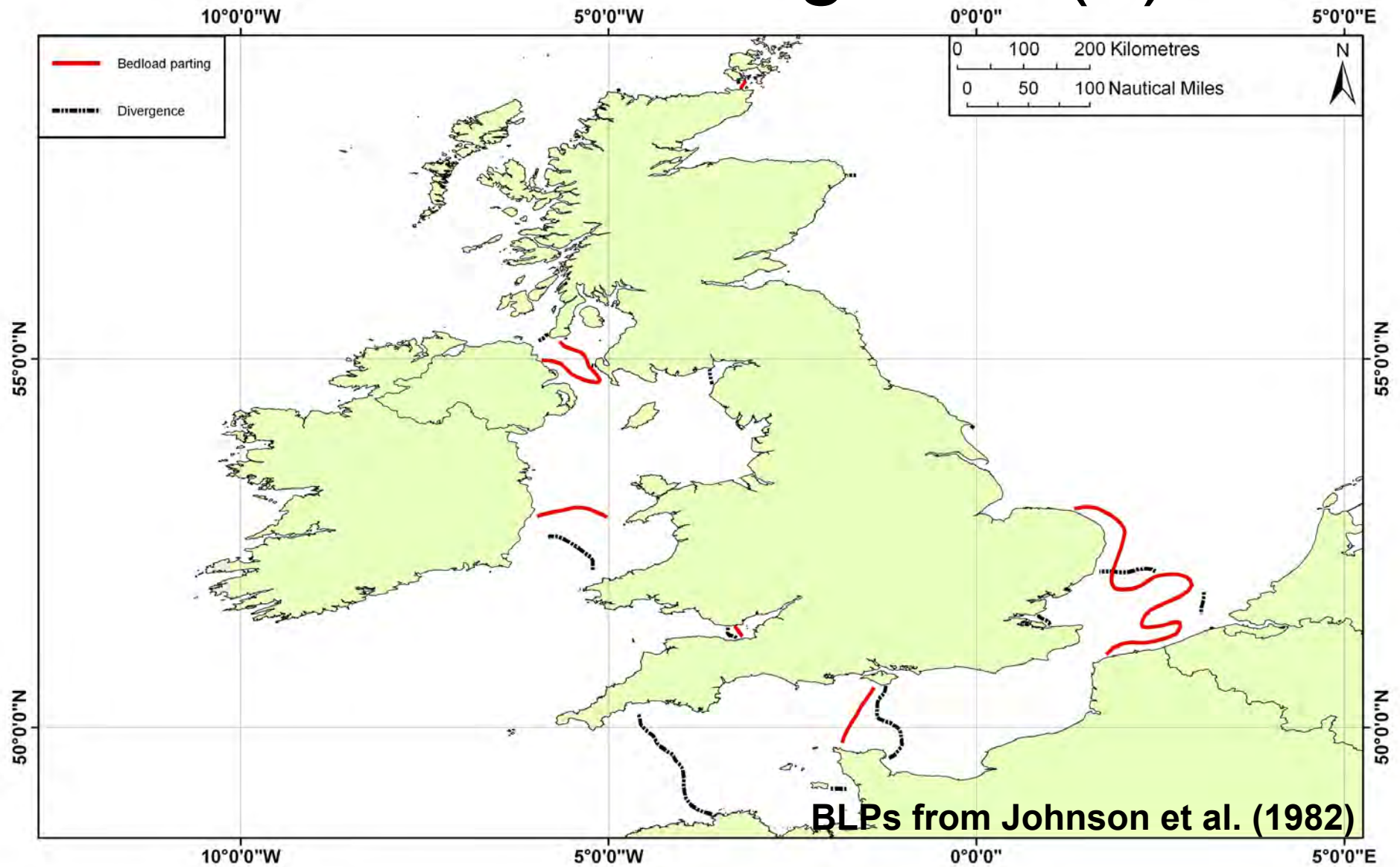
Modelled bedload transport



Tidal bed stress



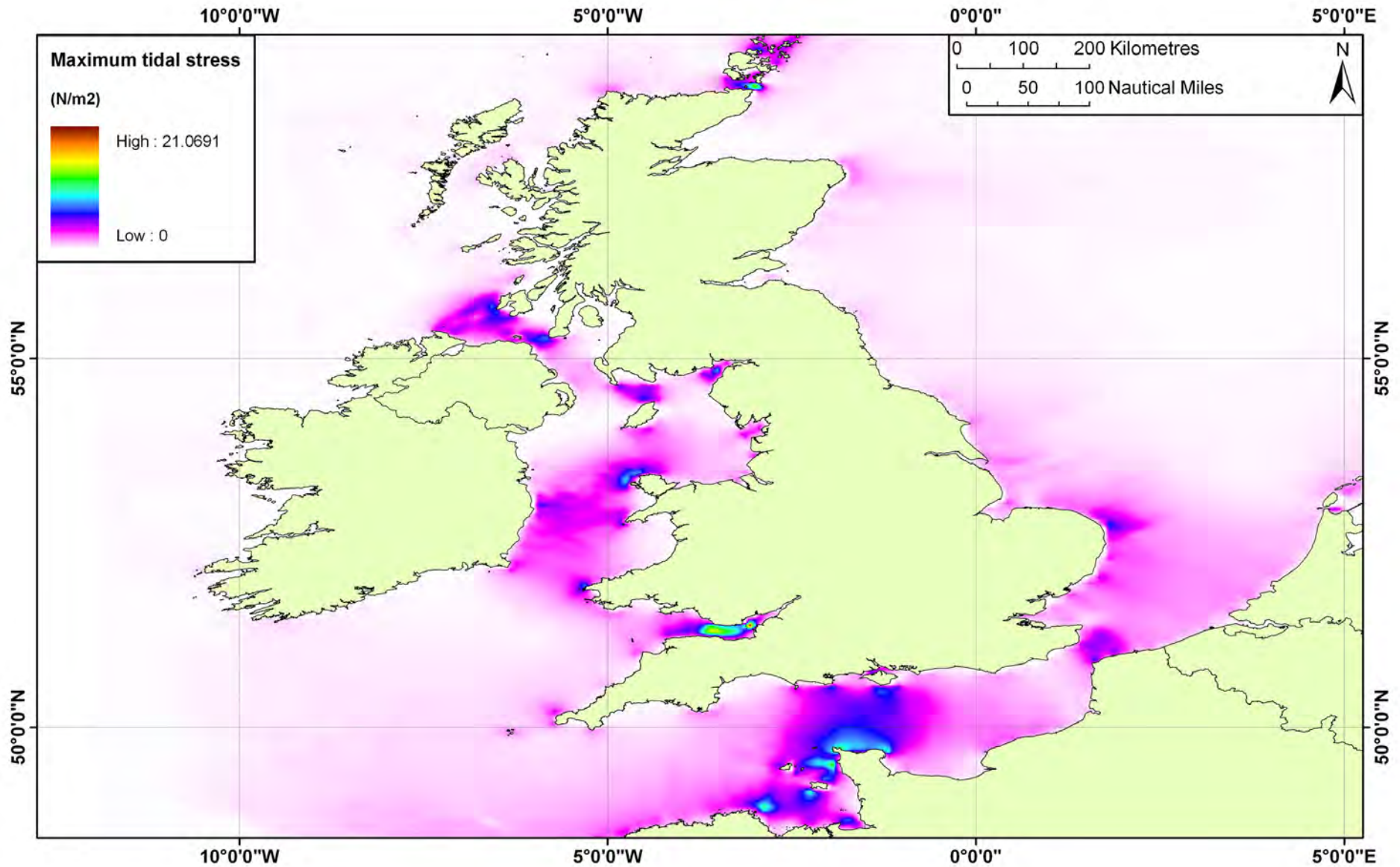
BLP and Divergence (1)



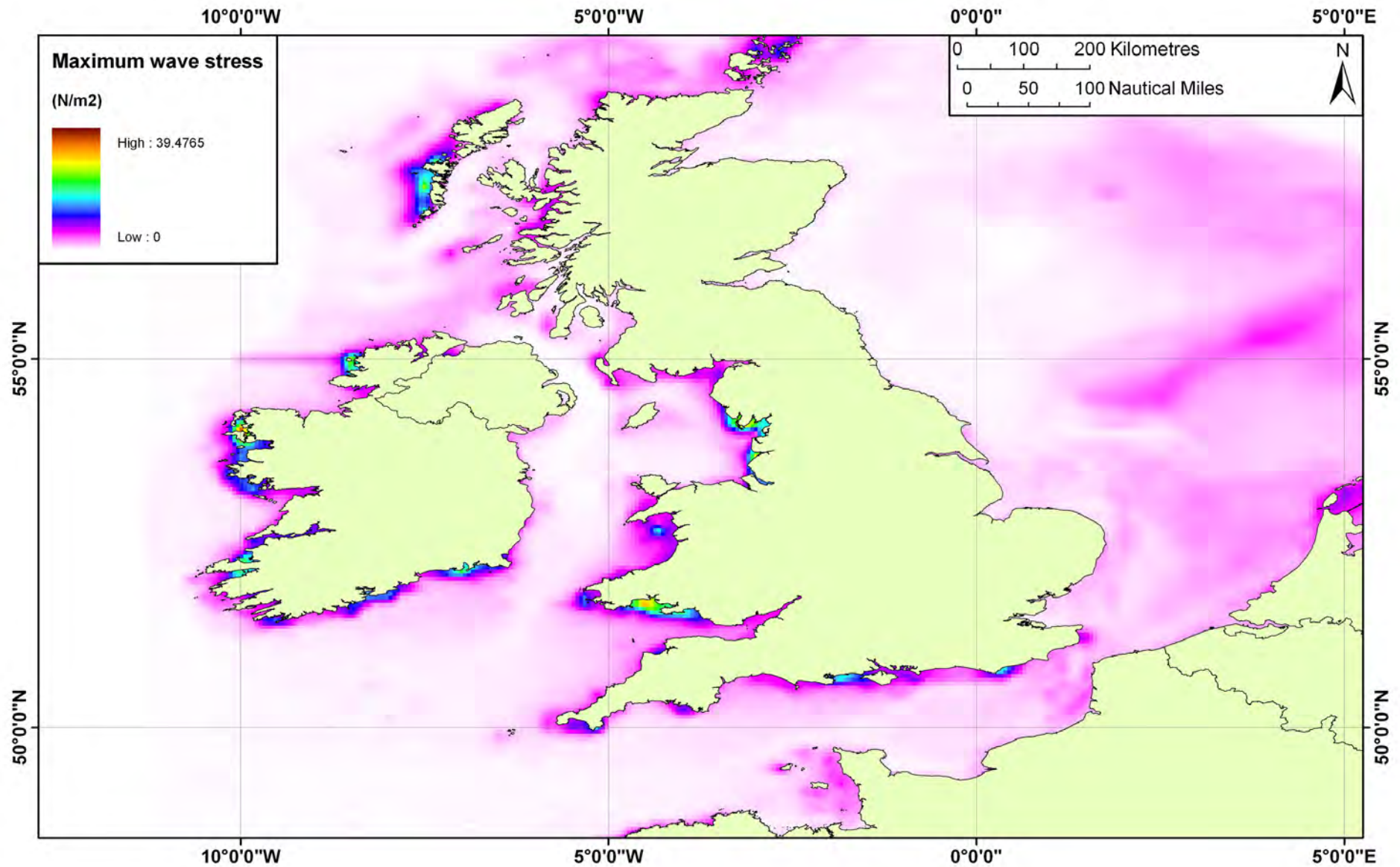
BLP and Divergence (2)

ID	Location	Current velocity (m/s)		Tidal stress (N/m ²)		BLP
		Minimum	Maximum	Minimum	Maximum	
3	Bristol Channel	0.96	3.06	1.80	12.70	Yes
7	North Channel 1	0.28	1.03	1.40	7.10	Yes
15	Wight-Contentin	1.70	3.71	0.30	6.60	Yes
9	Pentland Firth	0.54	1.16	4.20	6.10	Yes
5	Solway Firth	0.64	2.06	0.70	5.20	No
4	St. George's Channel			2.00	3.00	Yes
12	Southern Bight 1	1.23	1.87	0.40	3.00	Yes
1	Western Channel	0.31	0.95	0.10	2.30	No
2	Jersey-Cotentin	0.94	2.06	0.00	2.10	No
8	Cape Wrath	2.20	3.87	0.90	1.90	No
10	Kinneards Head	0.99	1.57	0.00	1.80	No
11	Flamborough Head	0.65	1.67	0.10	1.80	No
13	Southern Bight 2			1.40	1.60	Yes
14	Thames Estuary	0.13	1.15	0.30	1.50	No
6	North Channel 2	1.34	2.91	0.50	1.40	Yes

Other tidal stress maxima



Wave stress maxima



Summary

Where to look?

- Bedload partings
- Tidal stress maxima off headlands
- Wave-exposed coasts

But bedrock geology needs to be right as well...