



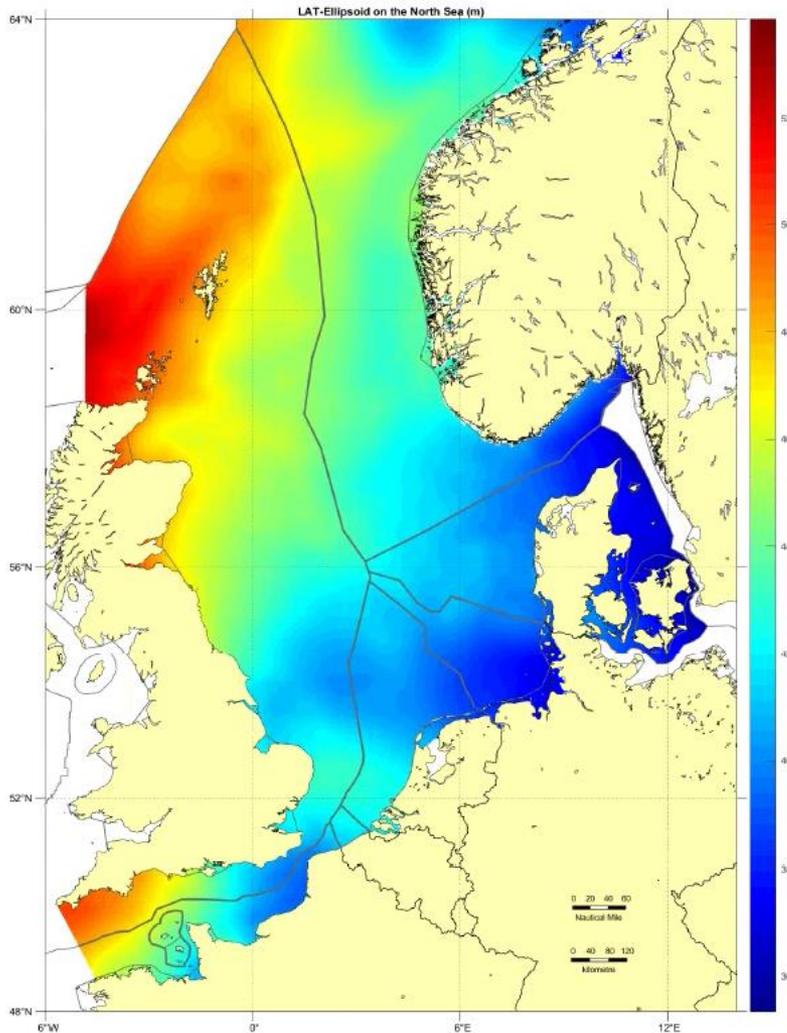
Royal Netherlands Navy

LAT differences on the North Sea

Update work of NSHC TWG

NSHC TWG27 – 04 Feb 2025
Ronald Kuilman, Thijs Ligteringen

Hydrographic Service
Geodesy and Tides



The LAT surfaces do not connect seamlessly to each other.

The NSHC tasked the TWG to improve the North Sea wide realization of the reference surfaces



Work plan items NSHC TWG

WP18/01

Improve North Sea wide realisation of reference surfaces

Explain and reduce differences in reference surfaces at the international boundaries.

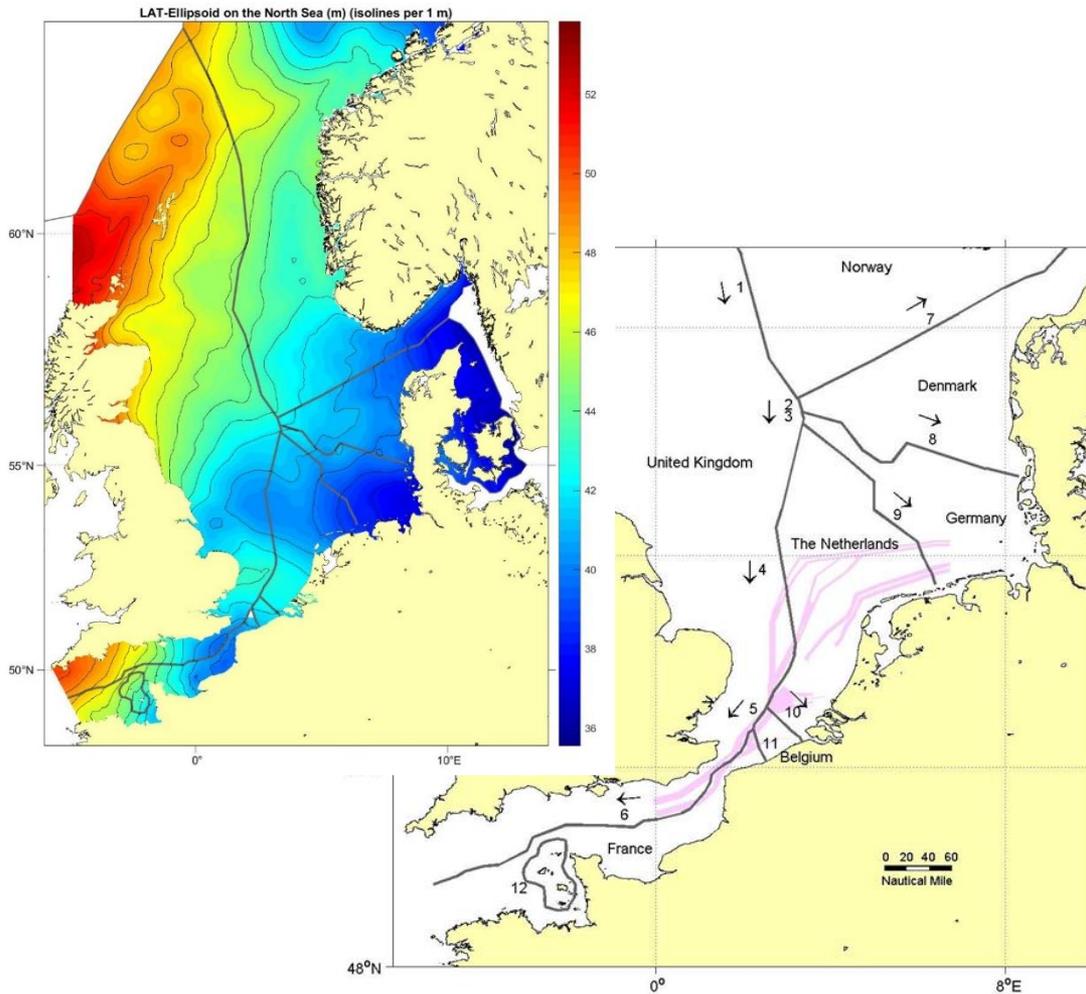
AP 23/02

Investigate all LAT differences at the borders.

AP 25/01

Investigate LAT differences at overlapping parts of surfaces.

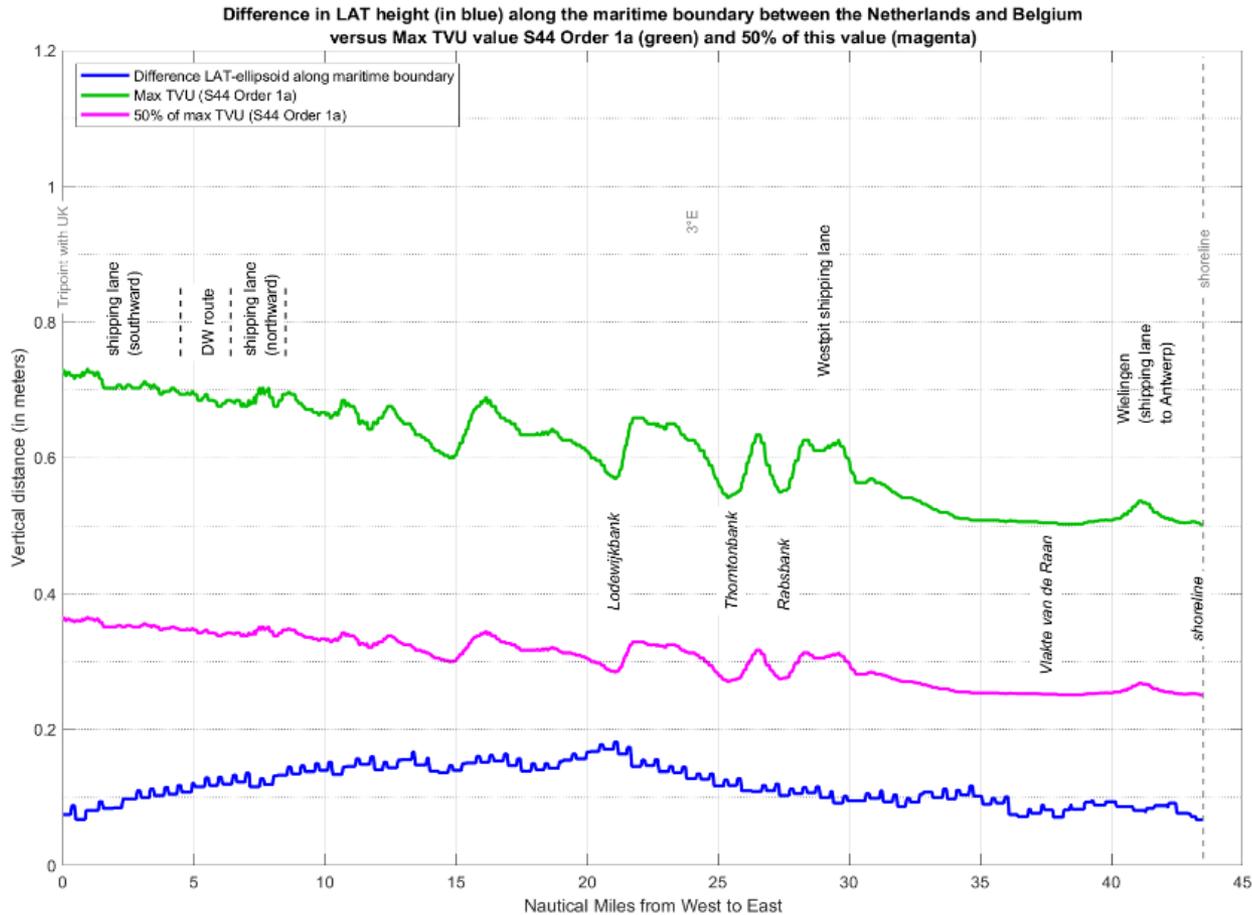
AP23/02: LAT differences at the borders



LAT difference = $\leq (1/2) \text{ TVU norm}$

| Depth (m) | TVU order 1a, 1b (m) | 1/2 TVU order 1a, 1b (m) |
|-----------|----------------------|--------------------------|
| 5 | 0,50 | 0,25 |
| 10 | 0,52 | 0,26 |
| 15 | 0,54 | 0,27 |
| 20 | 0,56 | 0,28 |
| 25 | 0,60 | 0,30 |

10. Netherlands-Belgium



If the blue line is entirely under the magenta line, we are in a safe status.

When some parts of the blue line go between the magenta line and the green line, there should be concerns.

Any parts of the blue line over the green line is definitely an issue.



data

2024 → received new data from France → compared
→ received new data from Denmark → work in progress

2026 → new data expected from Germany

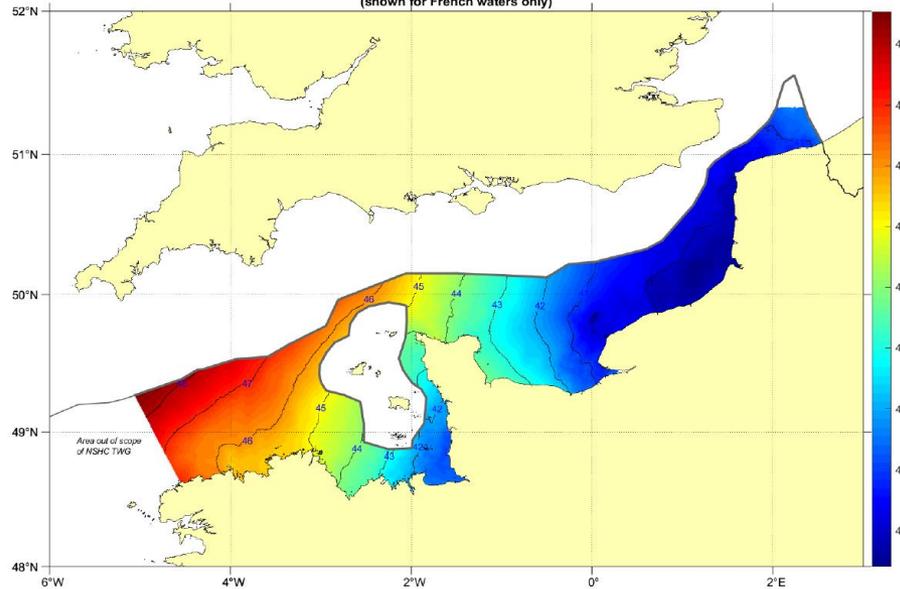
202.. updates from other countries are welcome 😊



New data France (BathyElli 2.2)

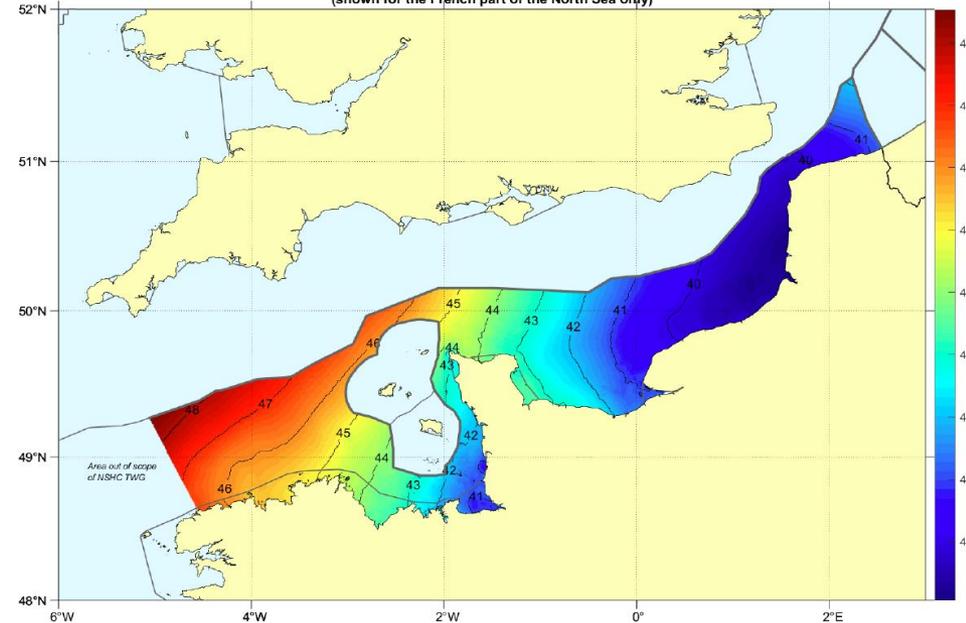
2022

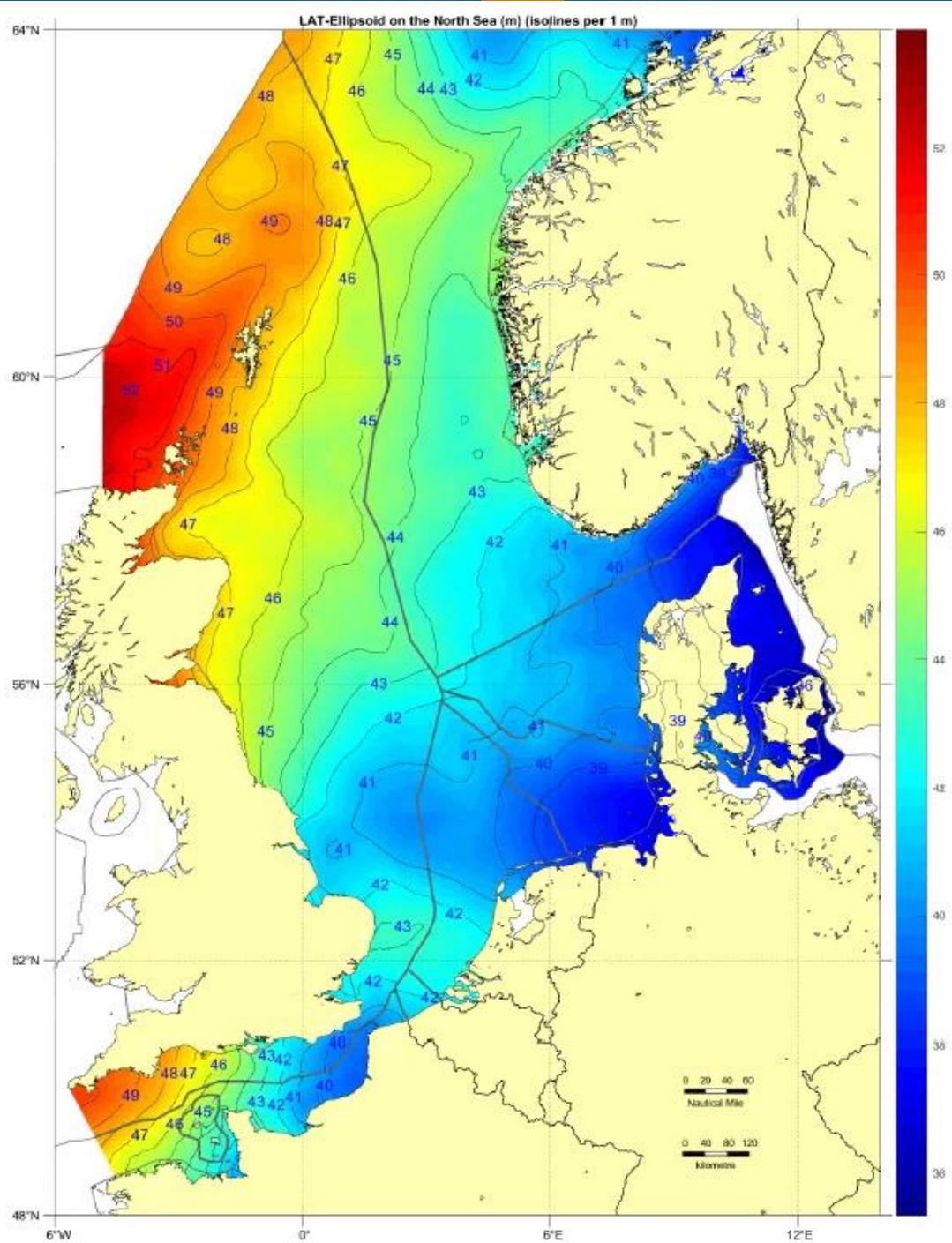
LAT-Ellipsoid on the North Sea (m), France (isolines per 1 m)
(shown for French waters only)



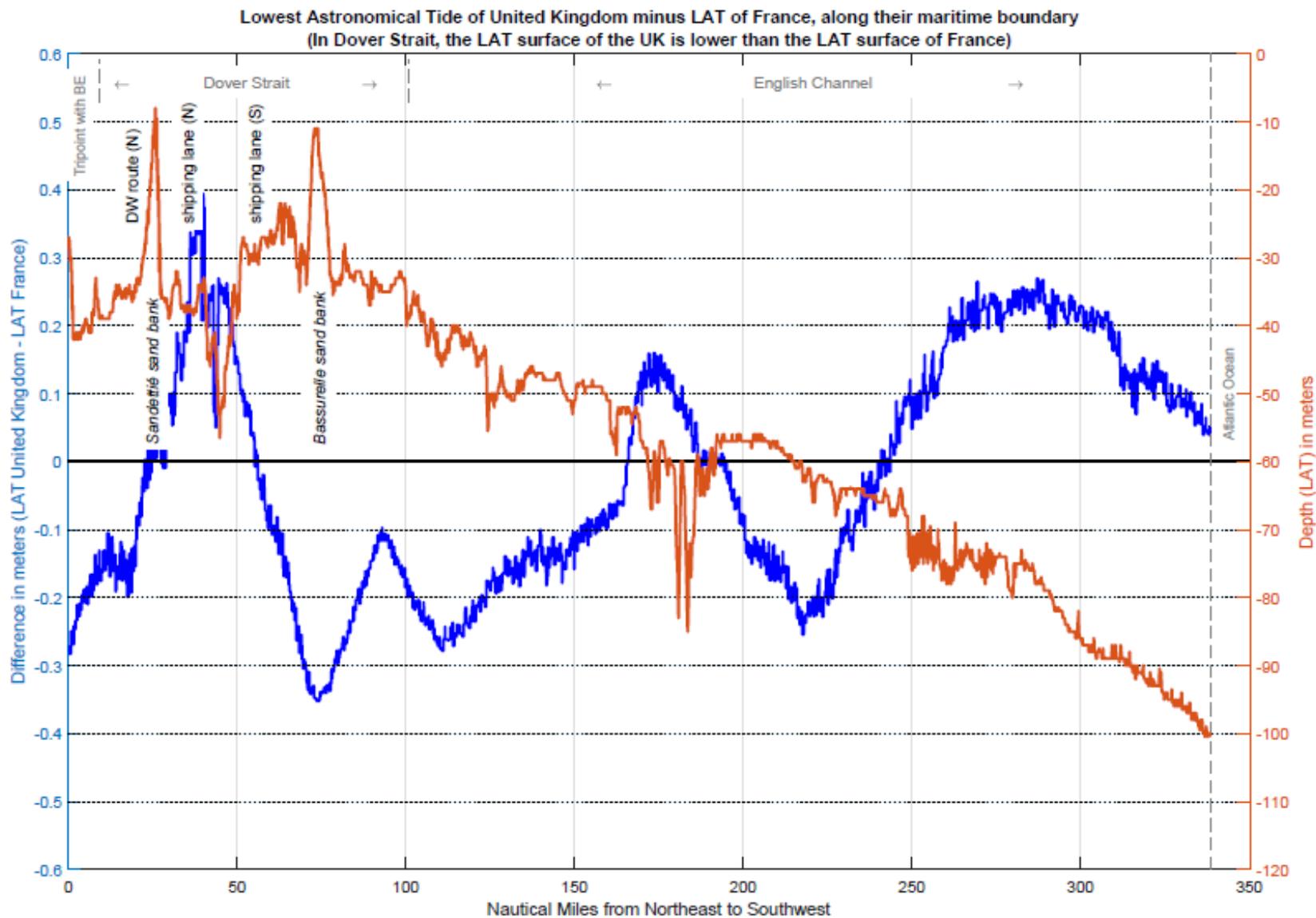
2024

LAT-Ellipsoid on the North Sea (m), France (isolines per 1 m)
(shown for the French part of the North Sea only)

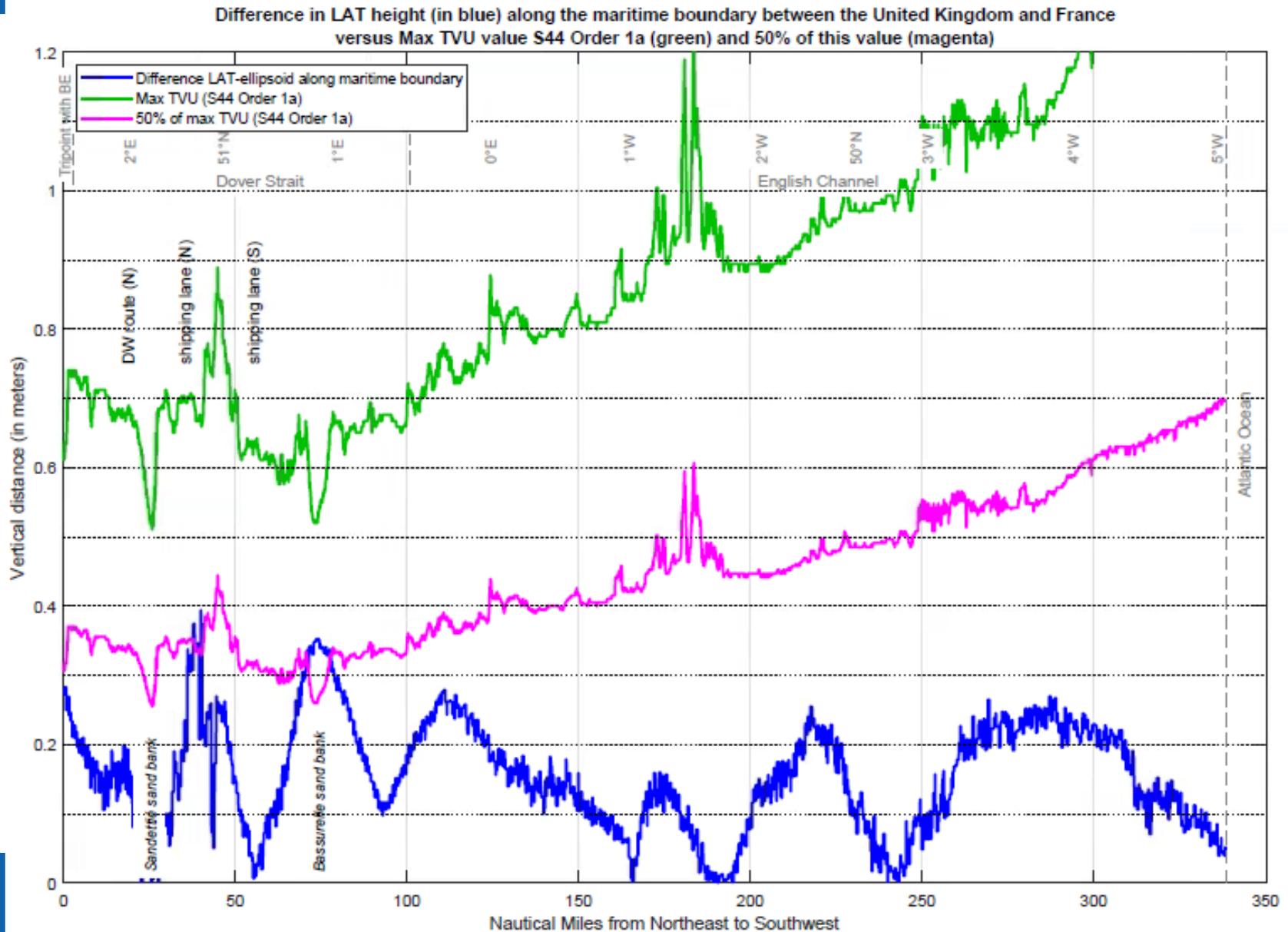




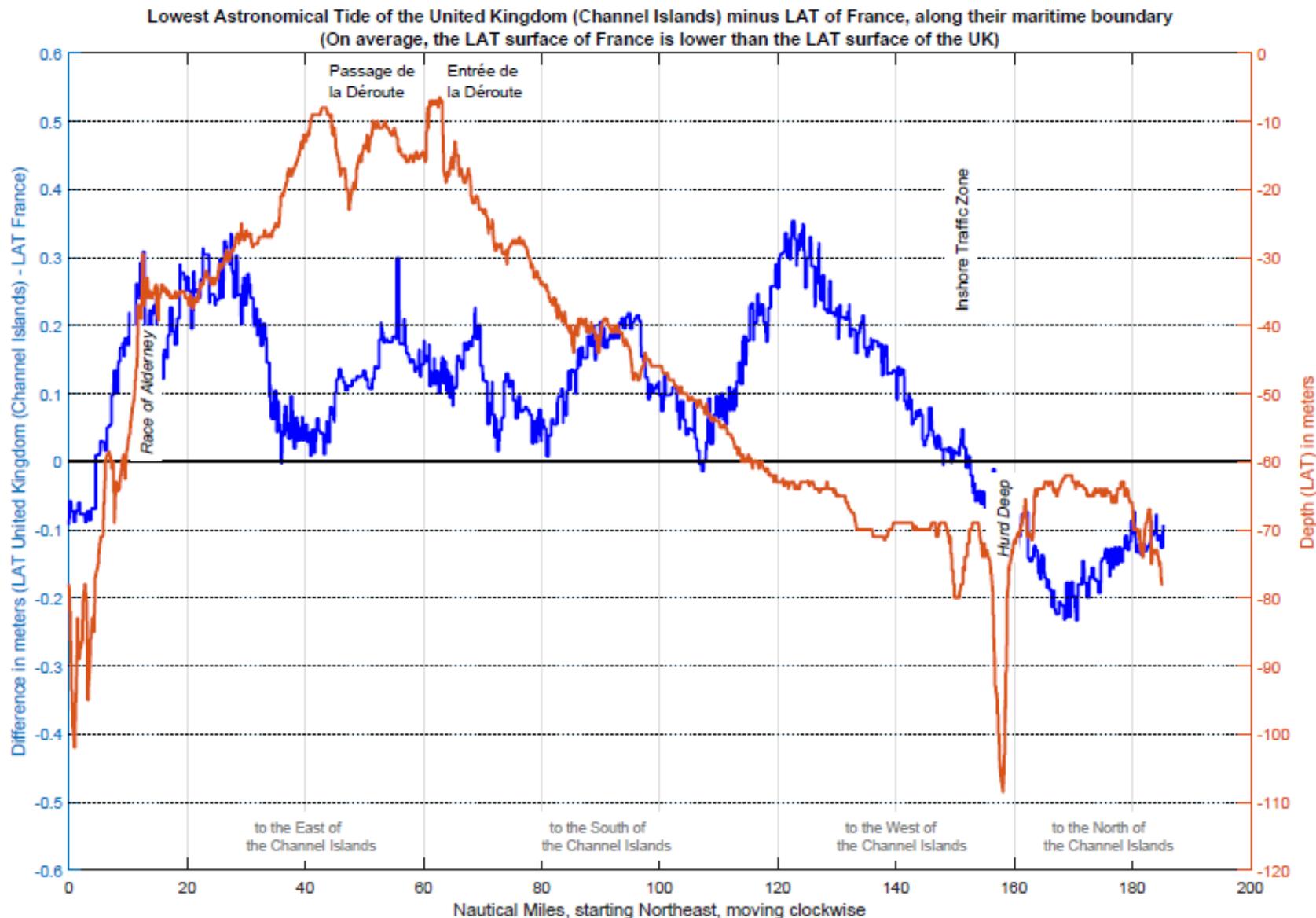
Boundary 6: UK – FR



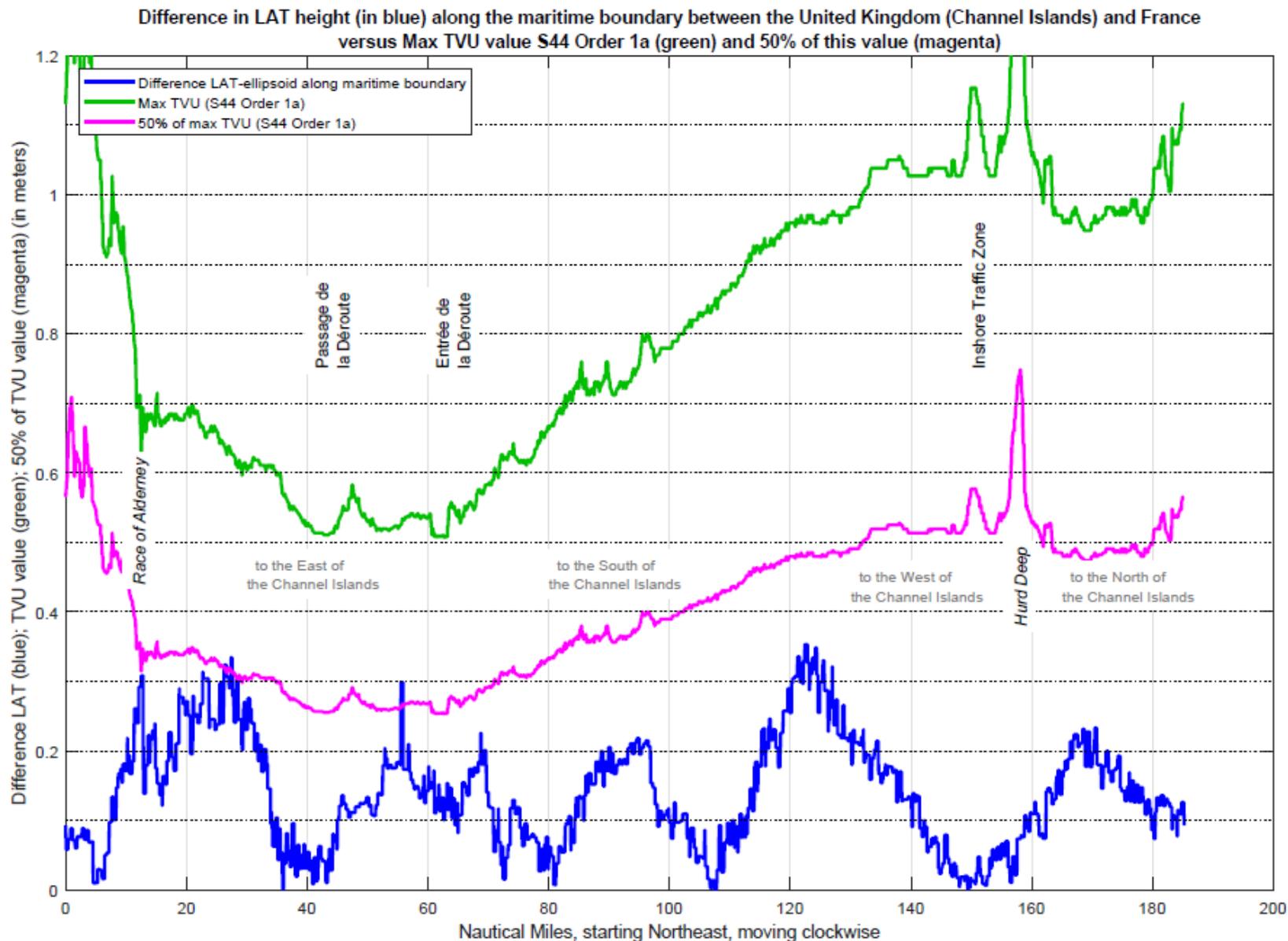
Boundary 6: UK - FR



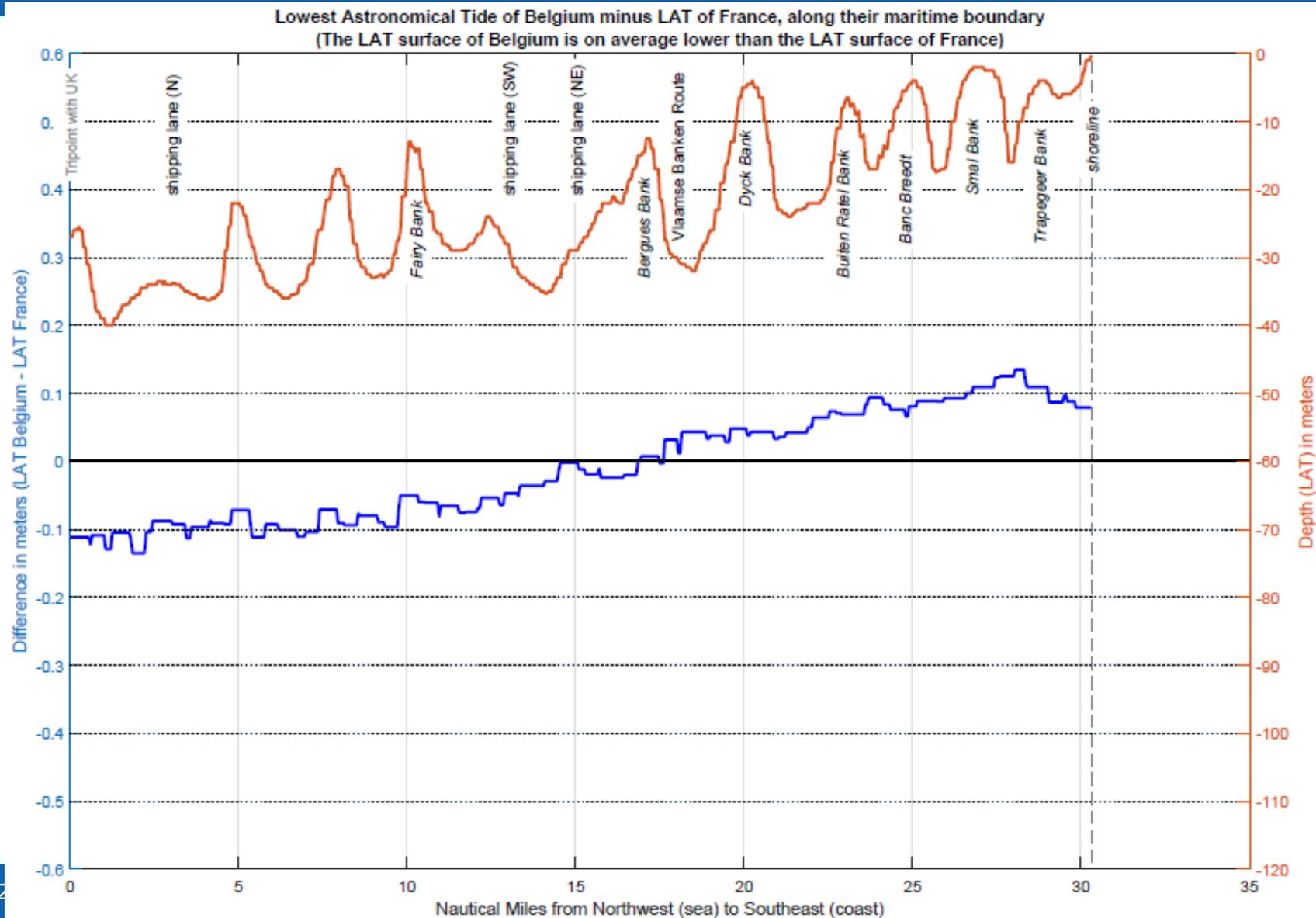
Boundary 12: UK (Channel Islands – France)



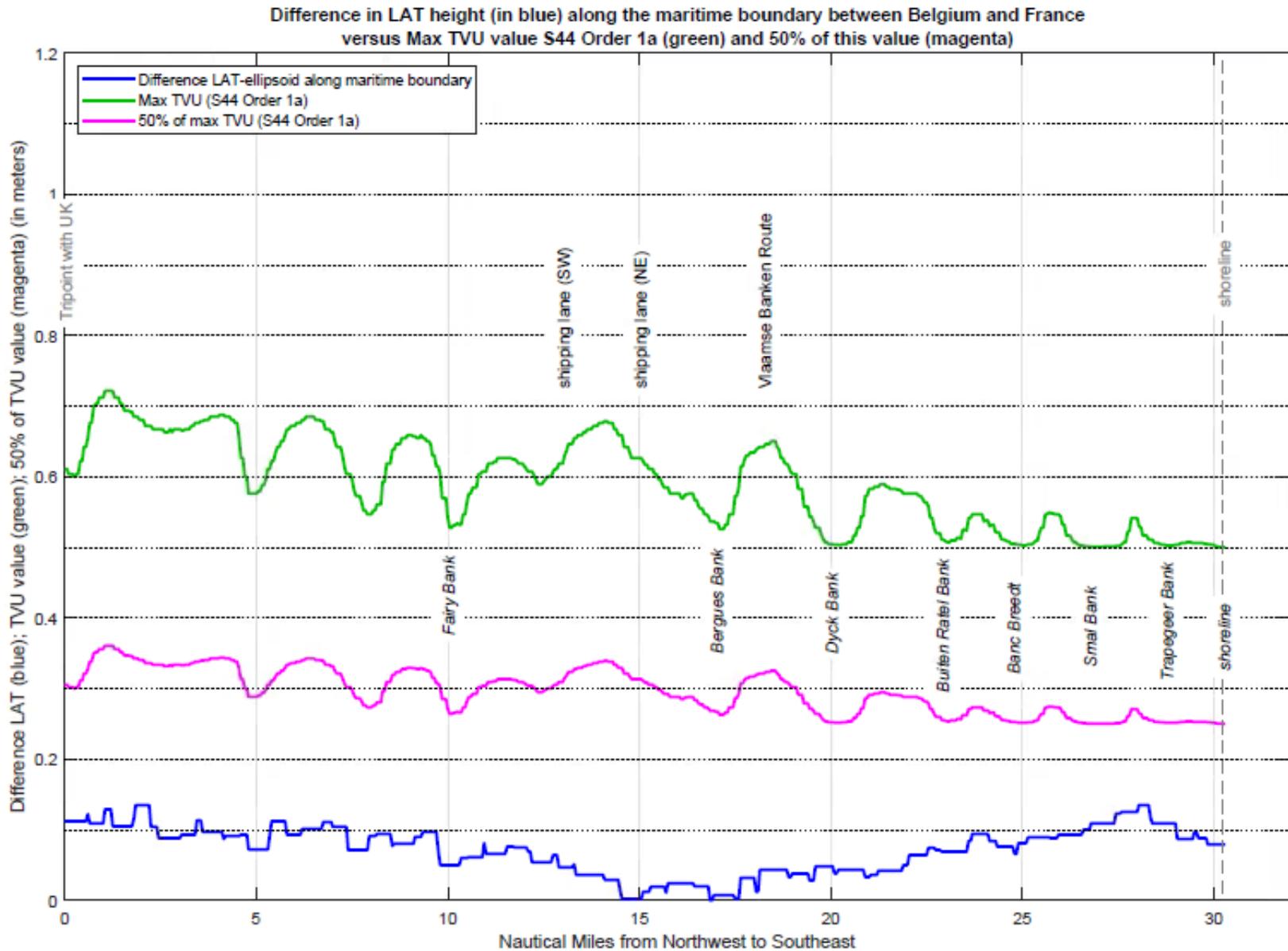
Boundary 12: UK (Channel Islands – France)



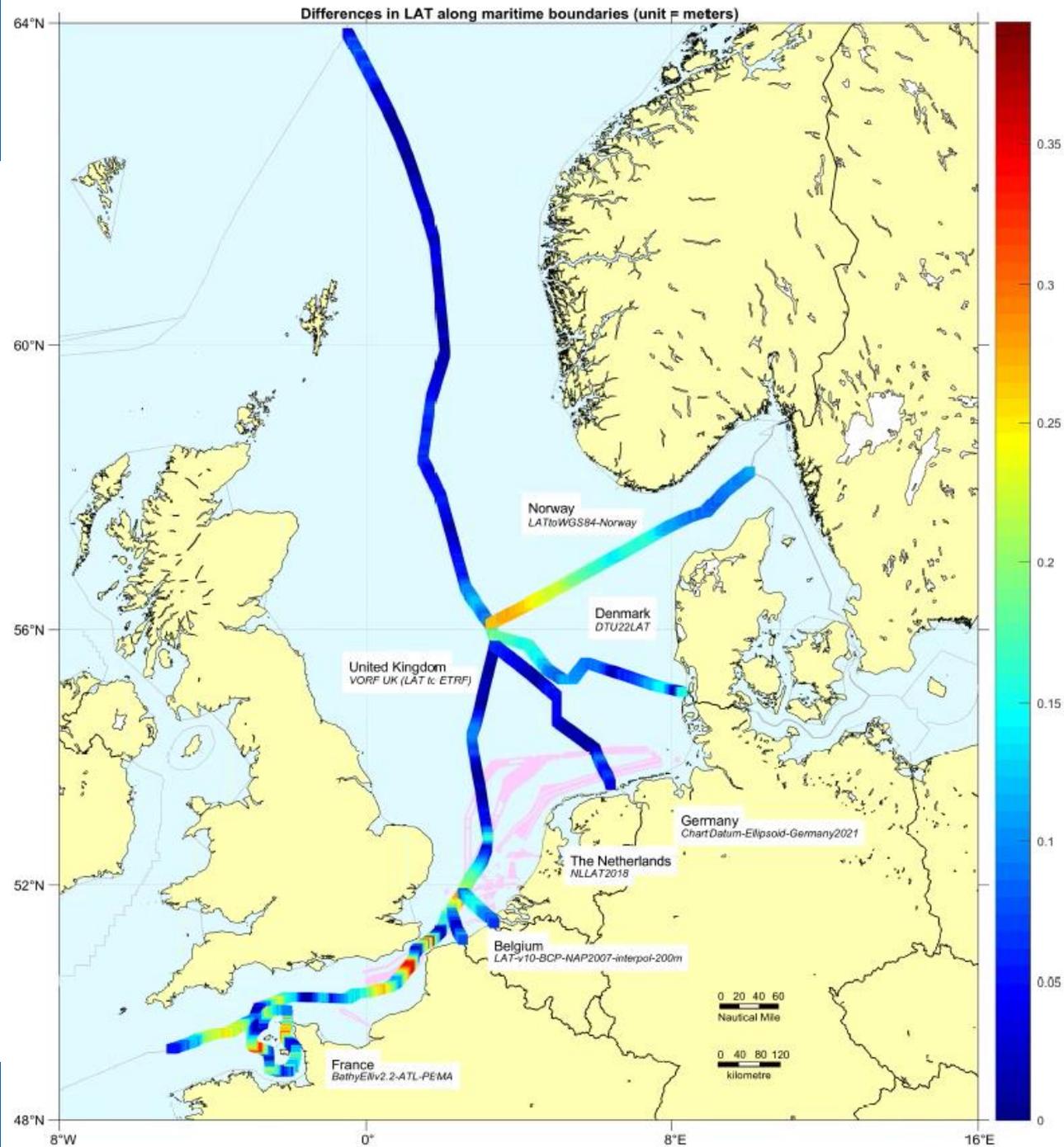
Boundary 11: BE - FR



Boundary 11: BE - FR



Overview LAT differences





Roadmap NSHC TWG

Continue to investigate the LAT differences at overlapping parts of surfaces:

- 1) *To explain and reduce differences in reference surfaces at the international boundaries.*
- 2) *From a scientific point of view.*



Questions?