Acoustic Noise Recorded by MERMAID Floats

and Its Relation to Ocean Wave Climate in the Mediterranean

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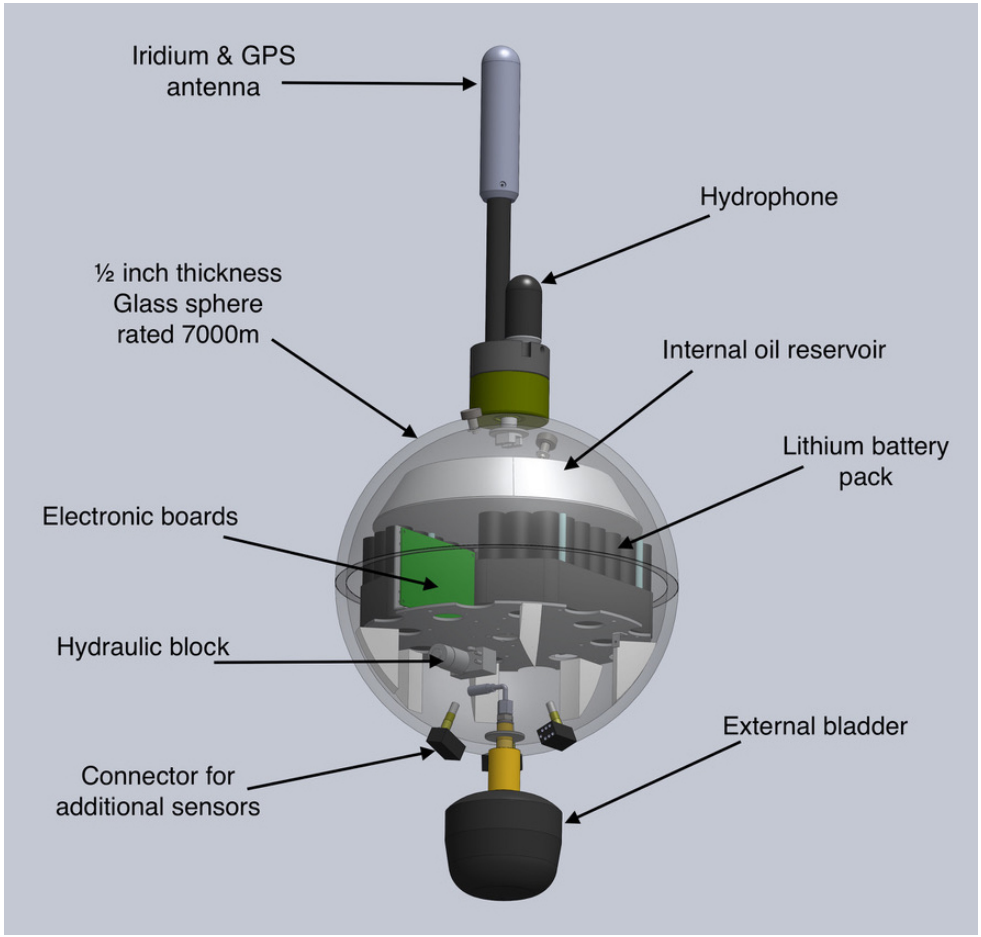
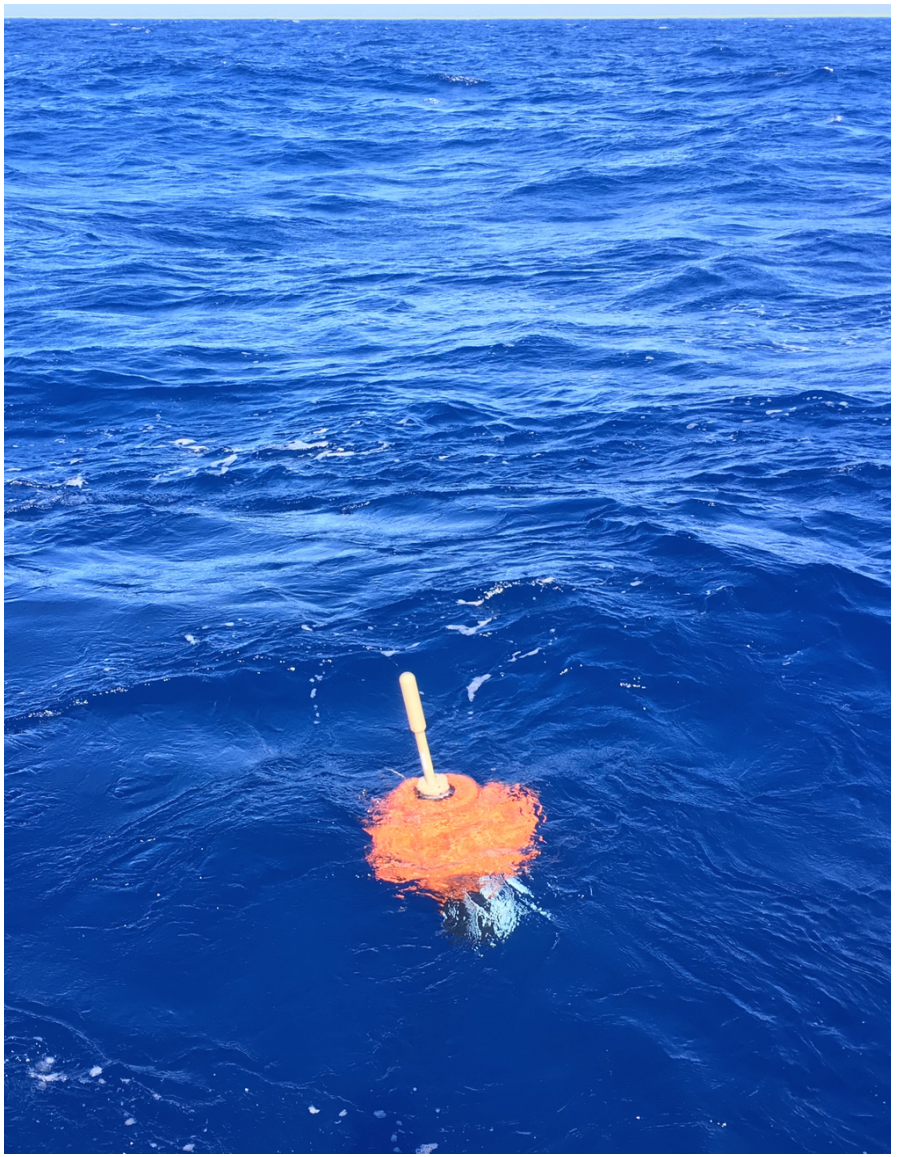
Five years of autonomy. One year of data buffer.



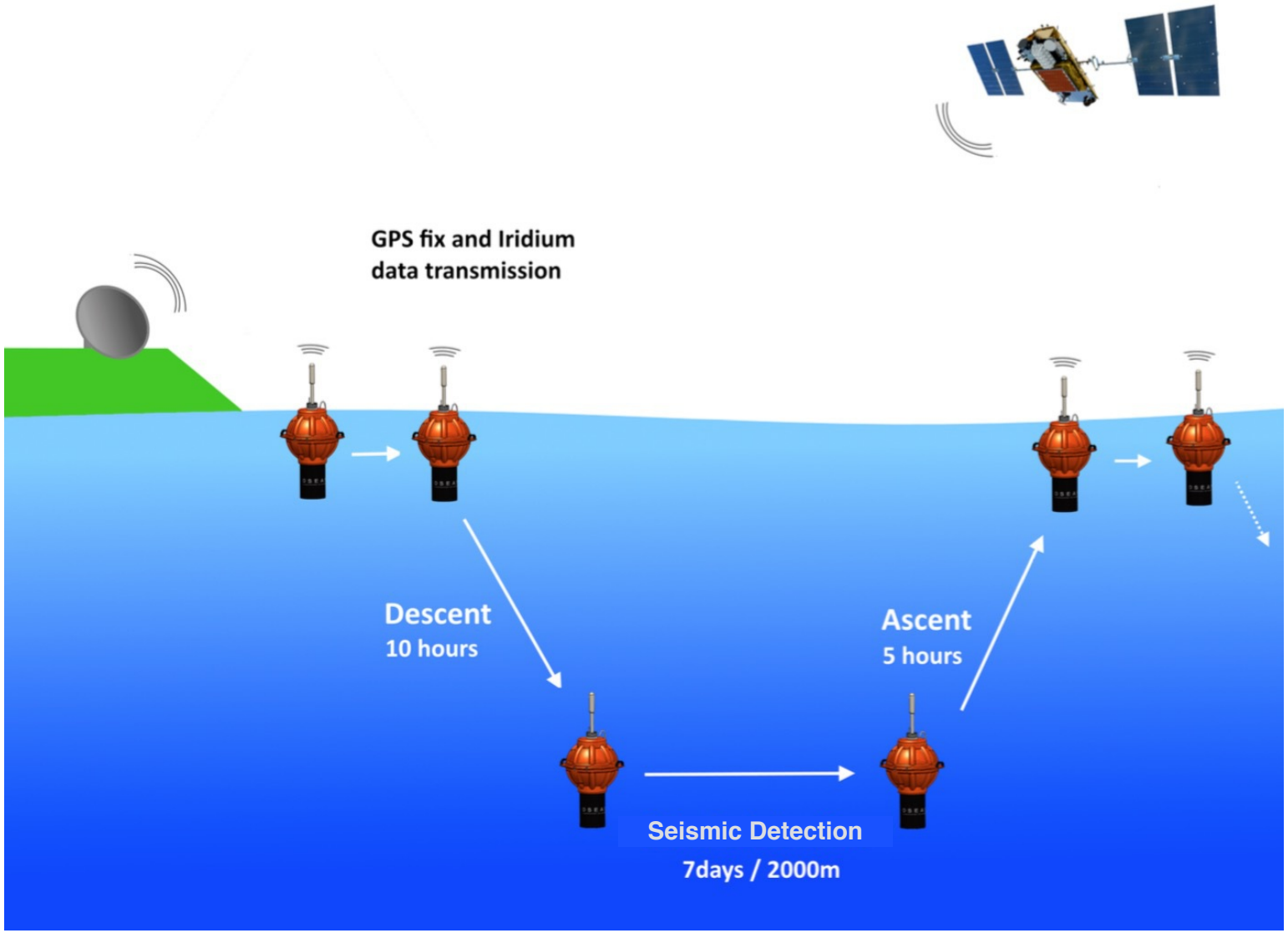
Hello & Nolet, 2020

Easily deployed. Data delivered in near-real time.

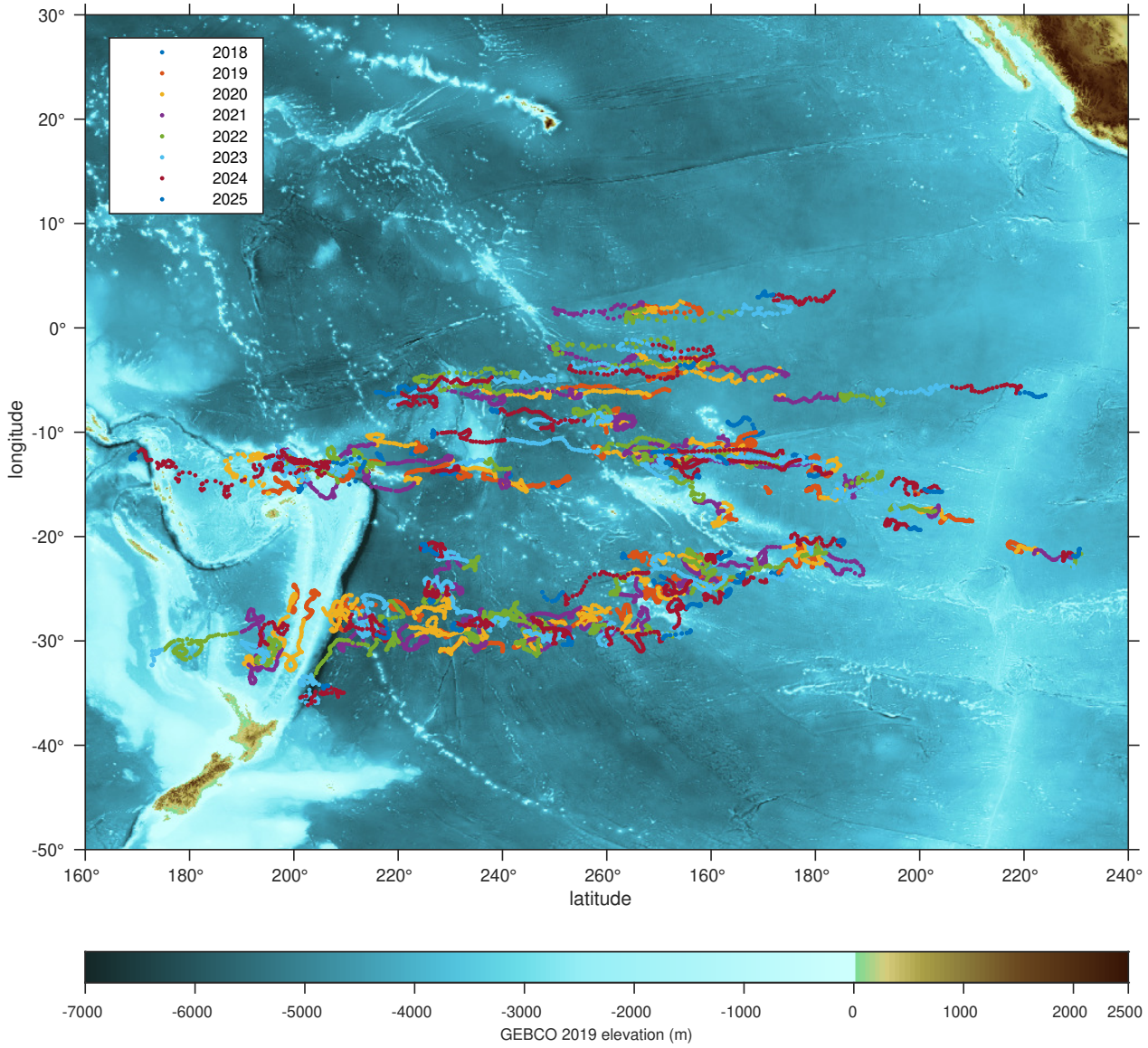


Simons, Pipatprathanporn & Simon, 2021

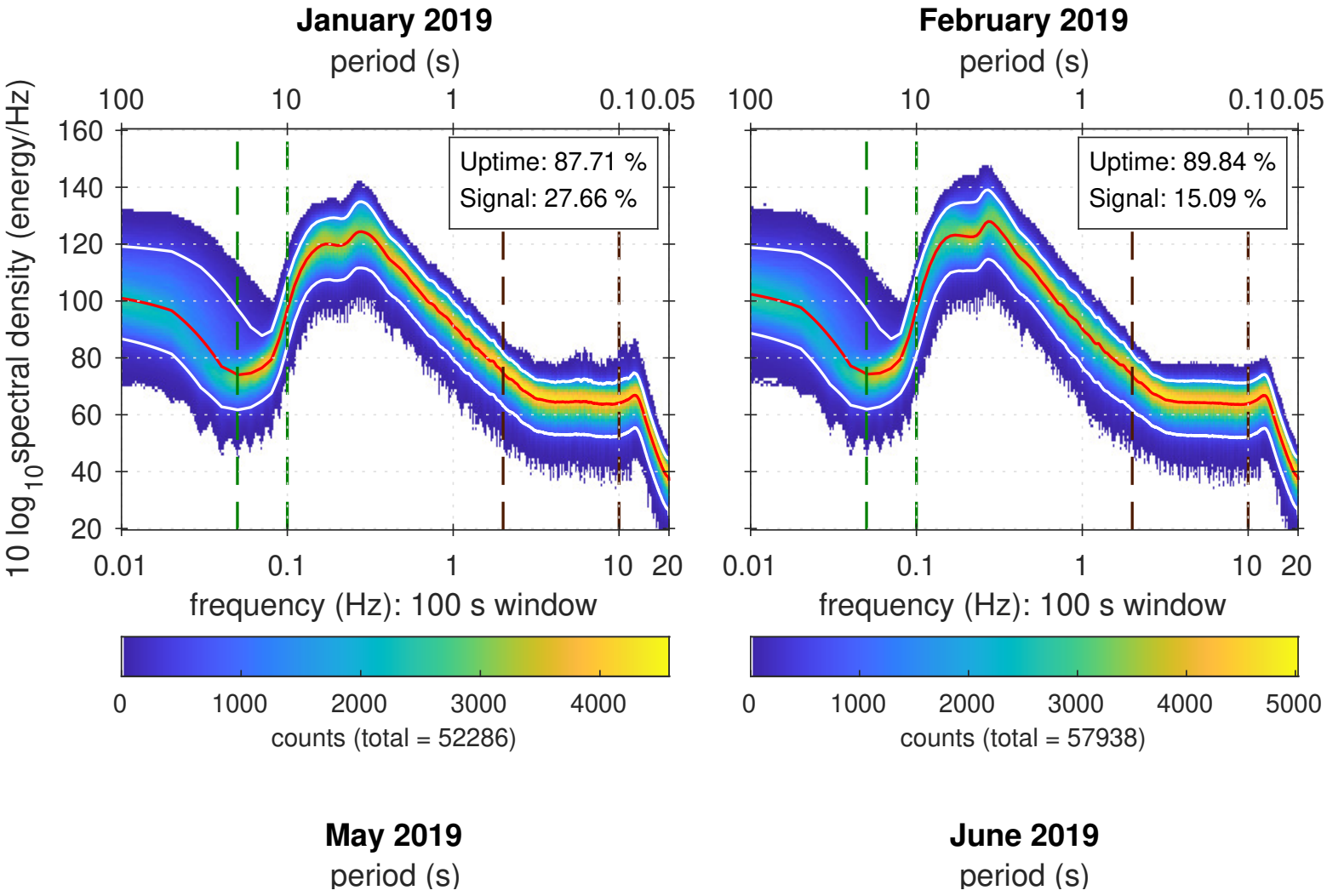
Surfacing about every week



Seven years and counting

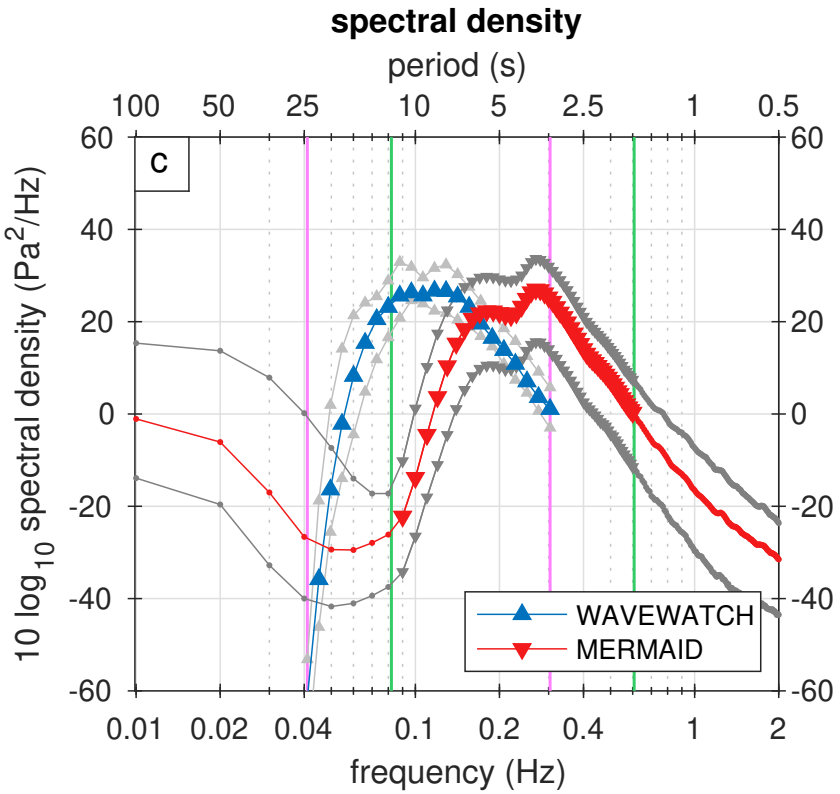


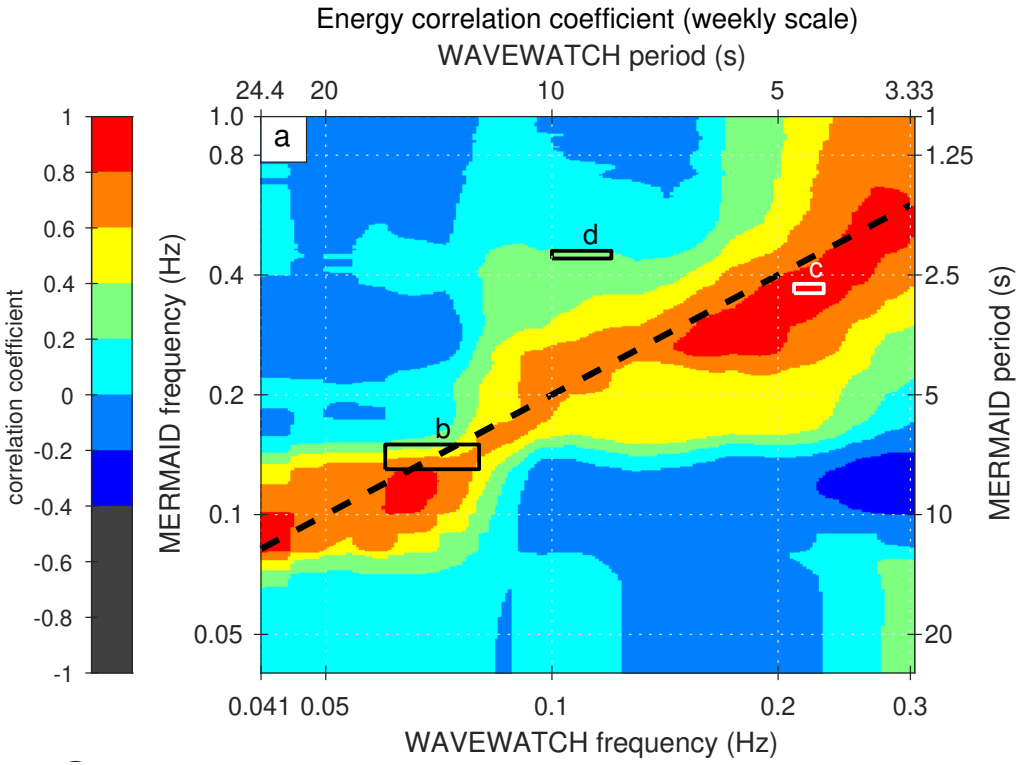
A most unusual recovery



Pipatprathanporn & Simons, 2022

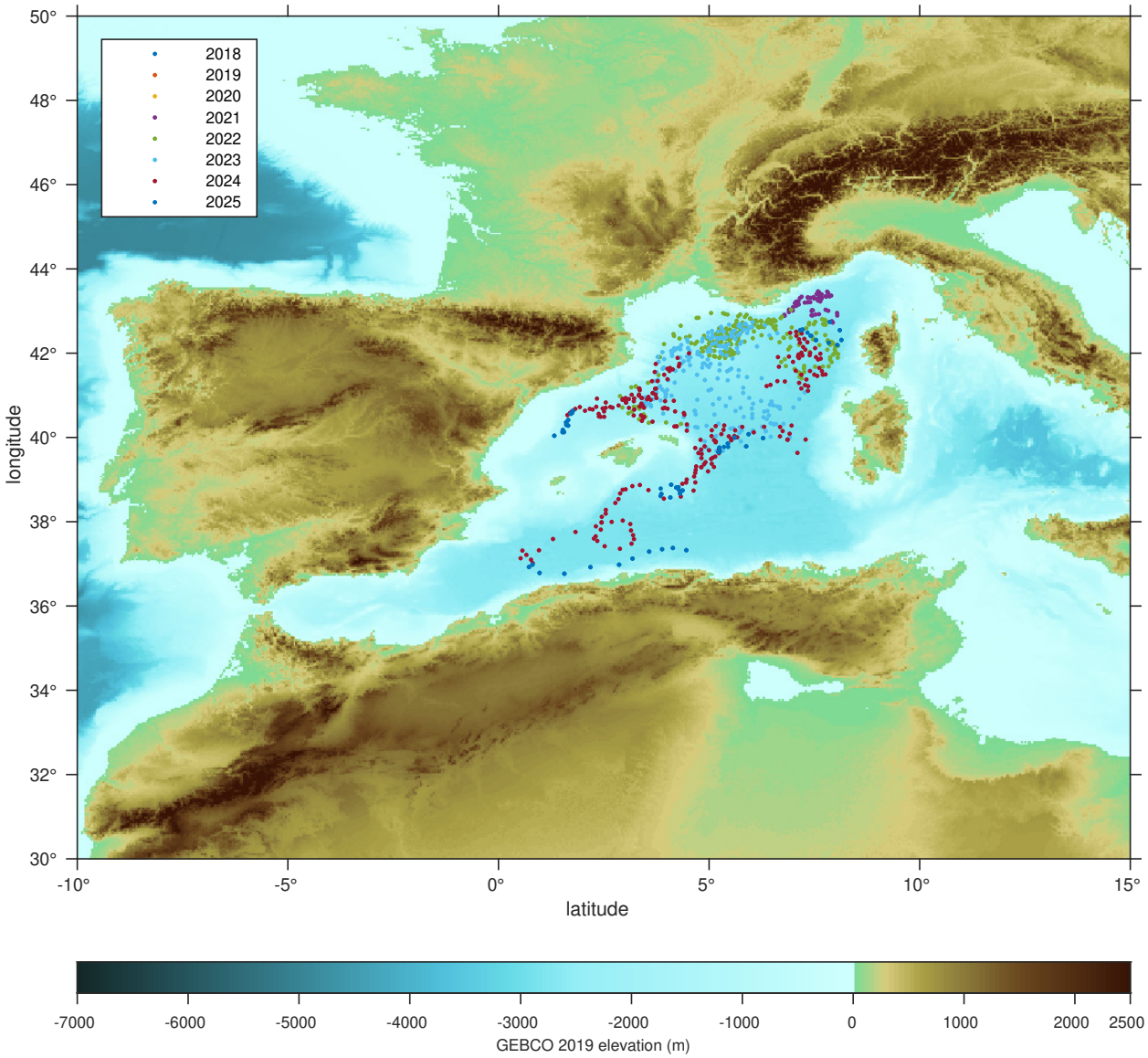
An environmental sensor



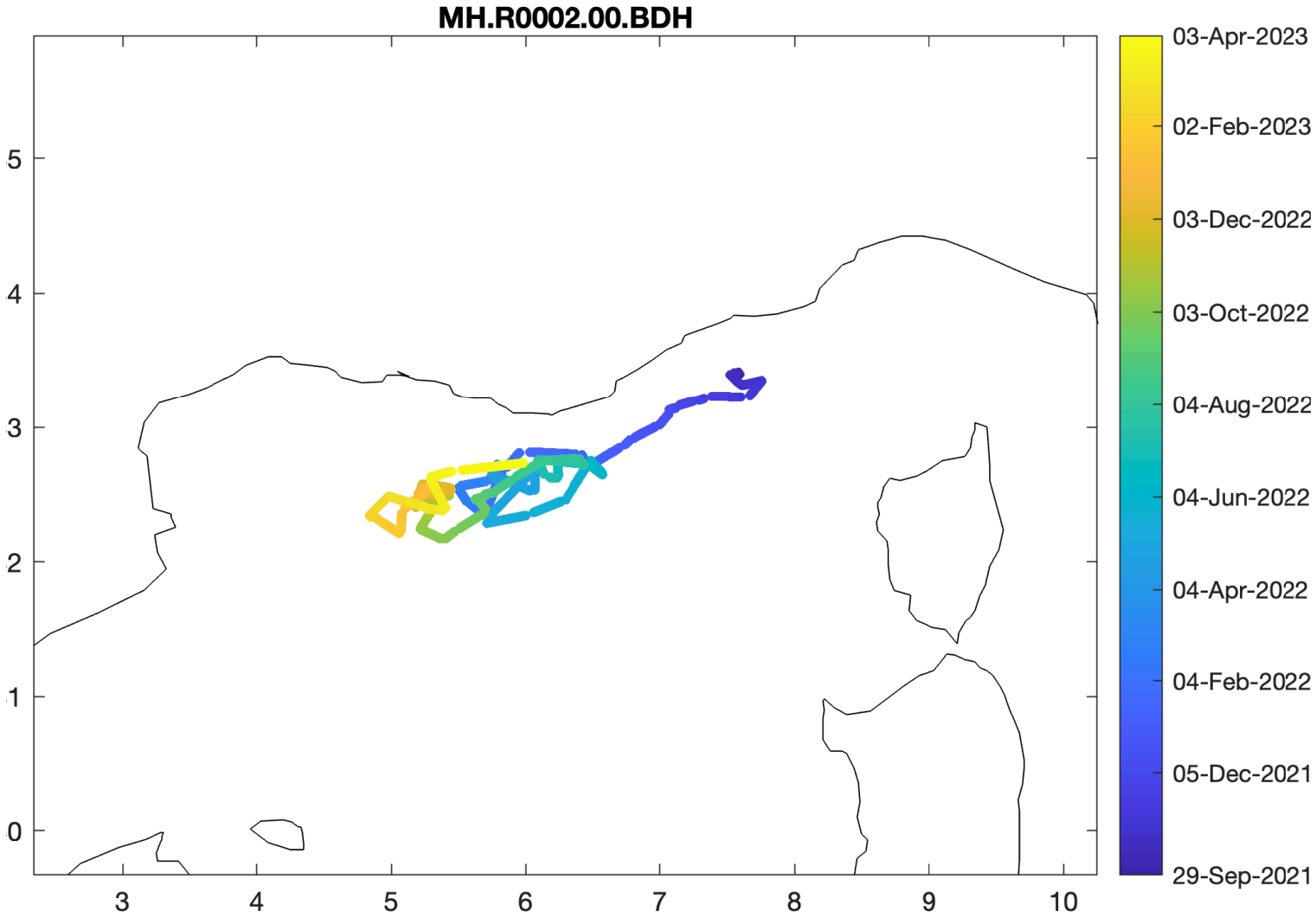


Pipatprathanporn & Simons, 2022

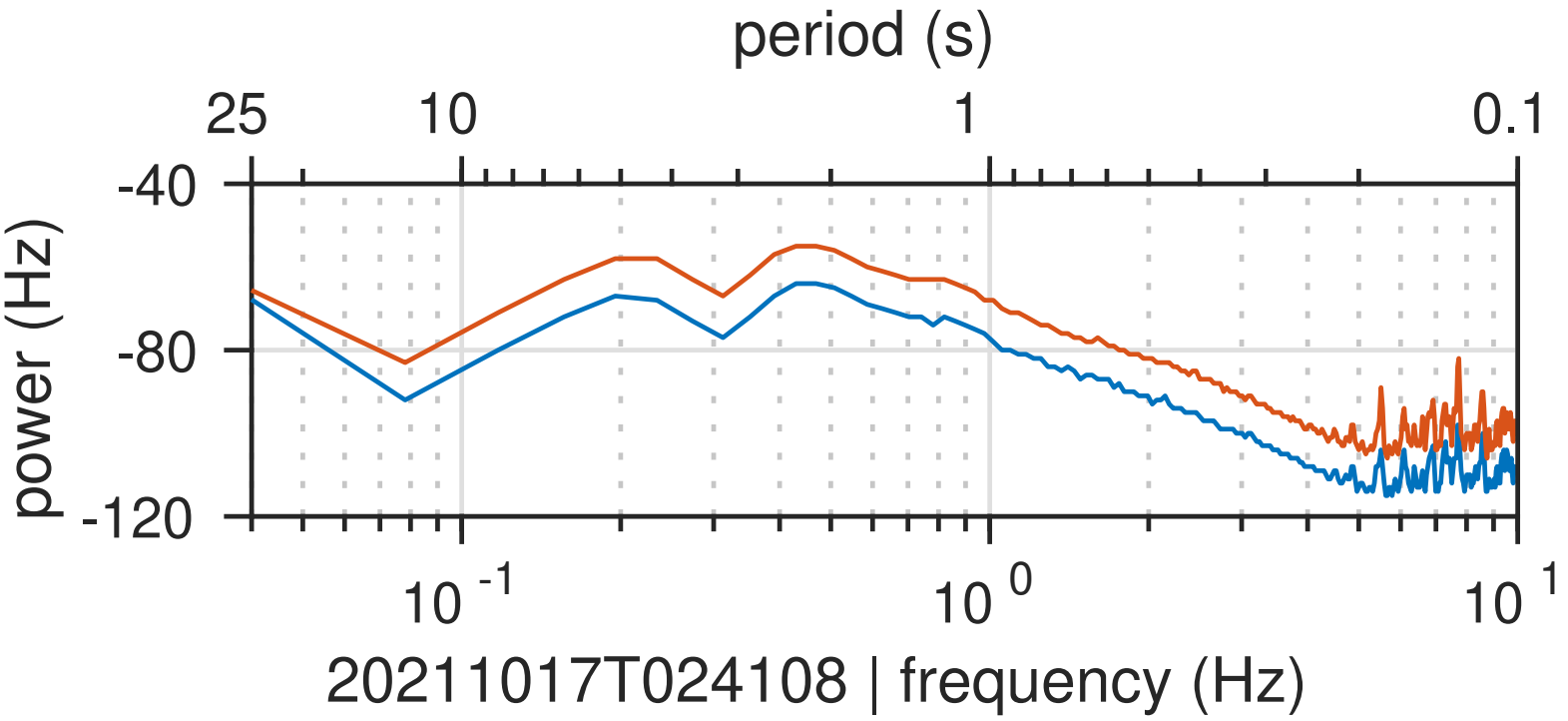
All ears on the Mediterranean



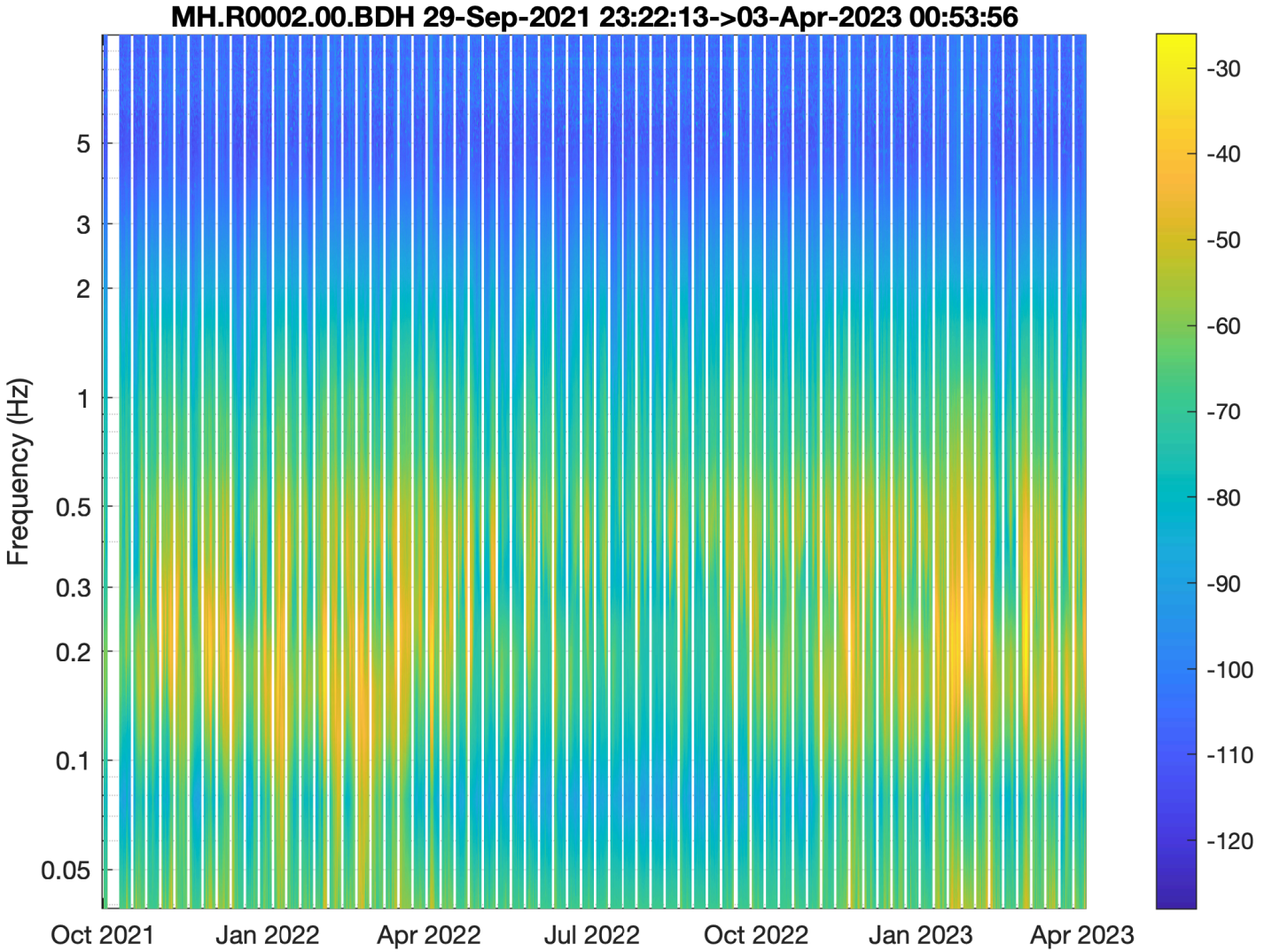
One trajectory



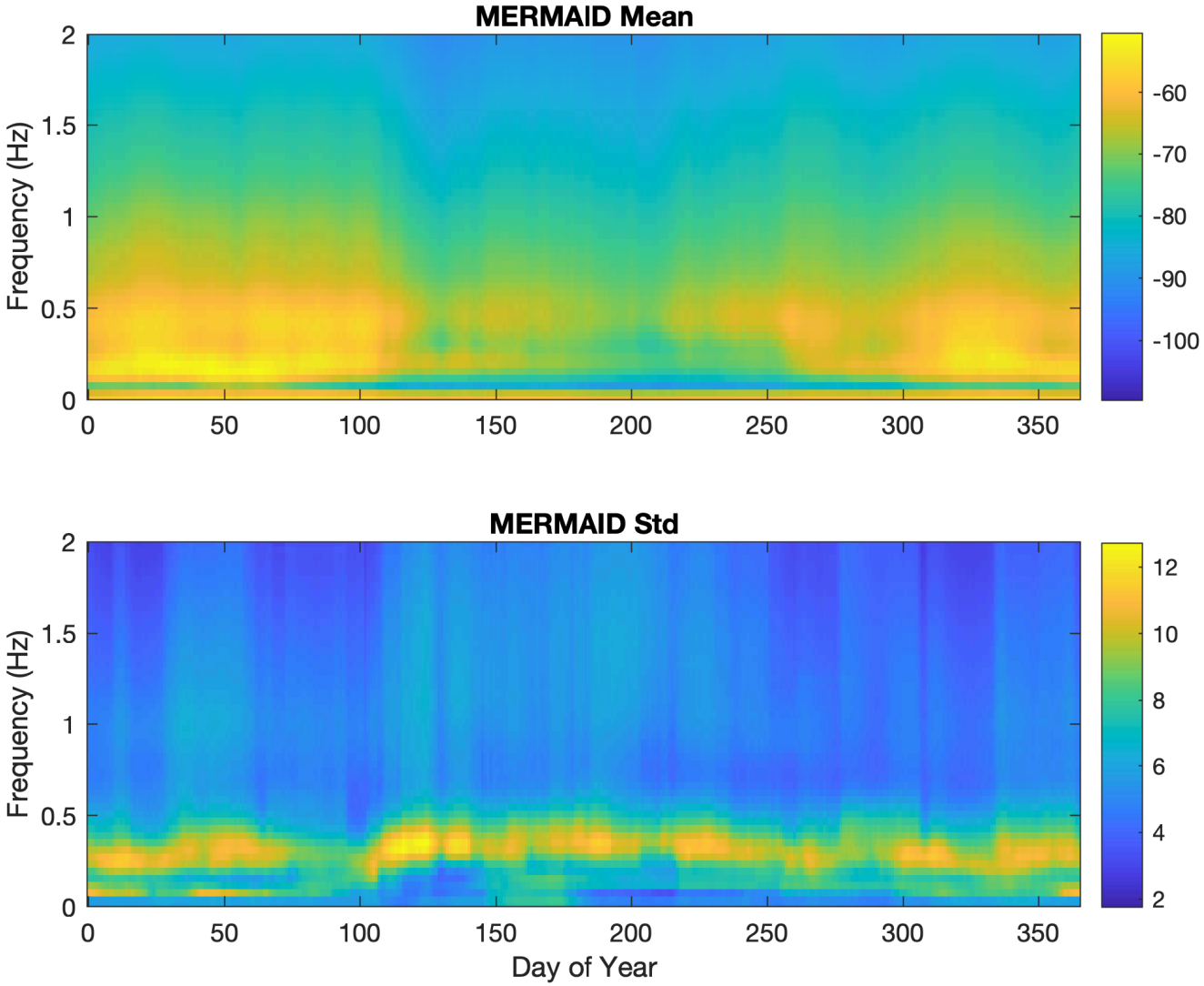
One spectral density



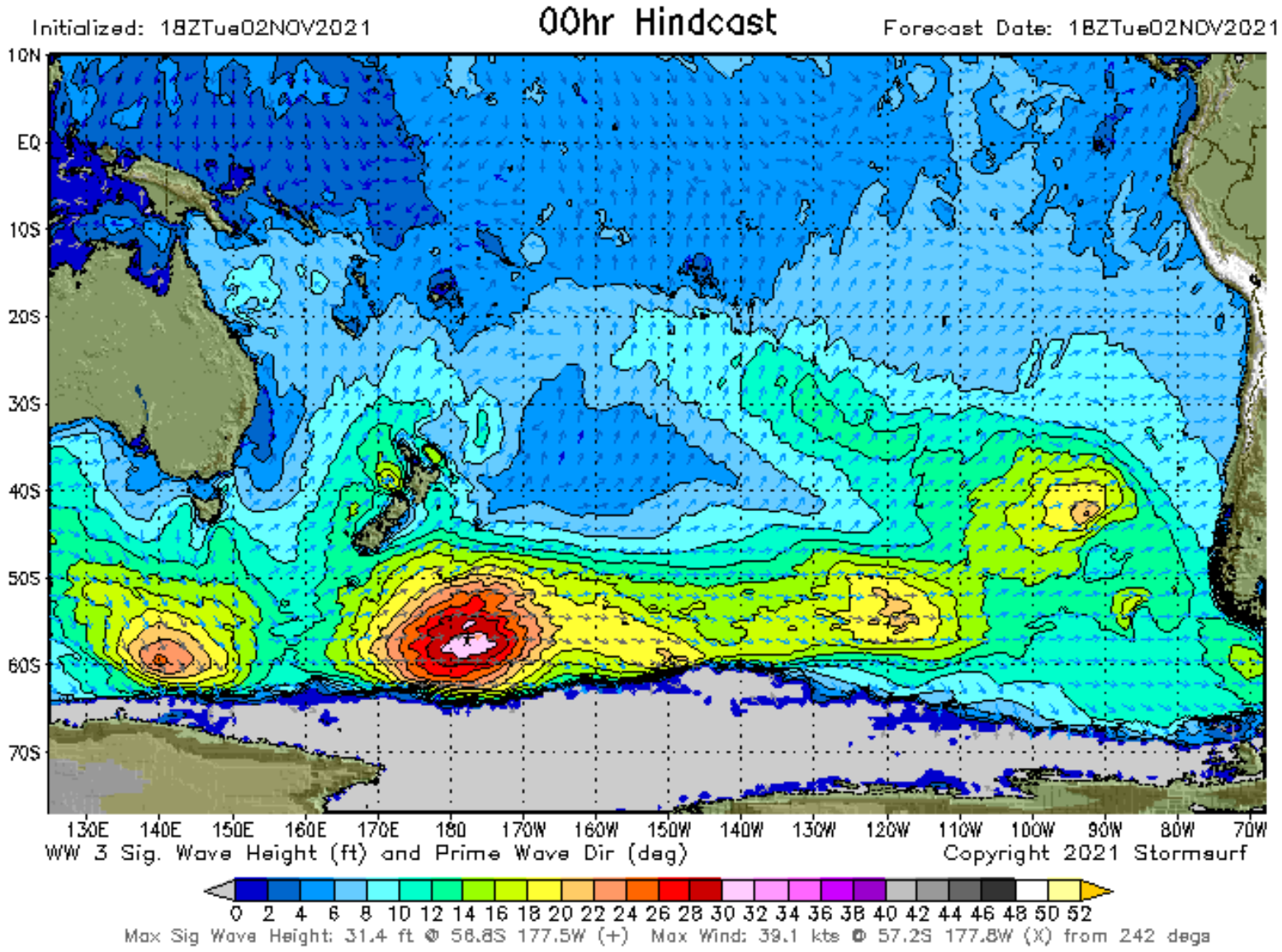
The complete record



Seasonal variability



Ocean Waves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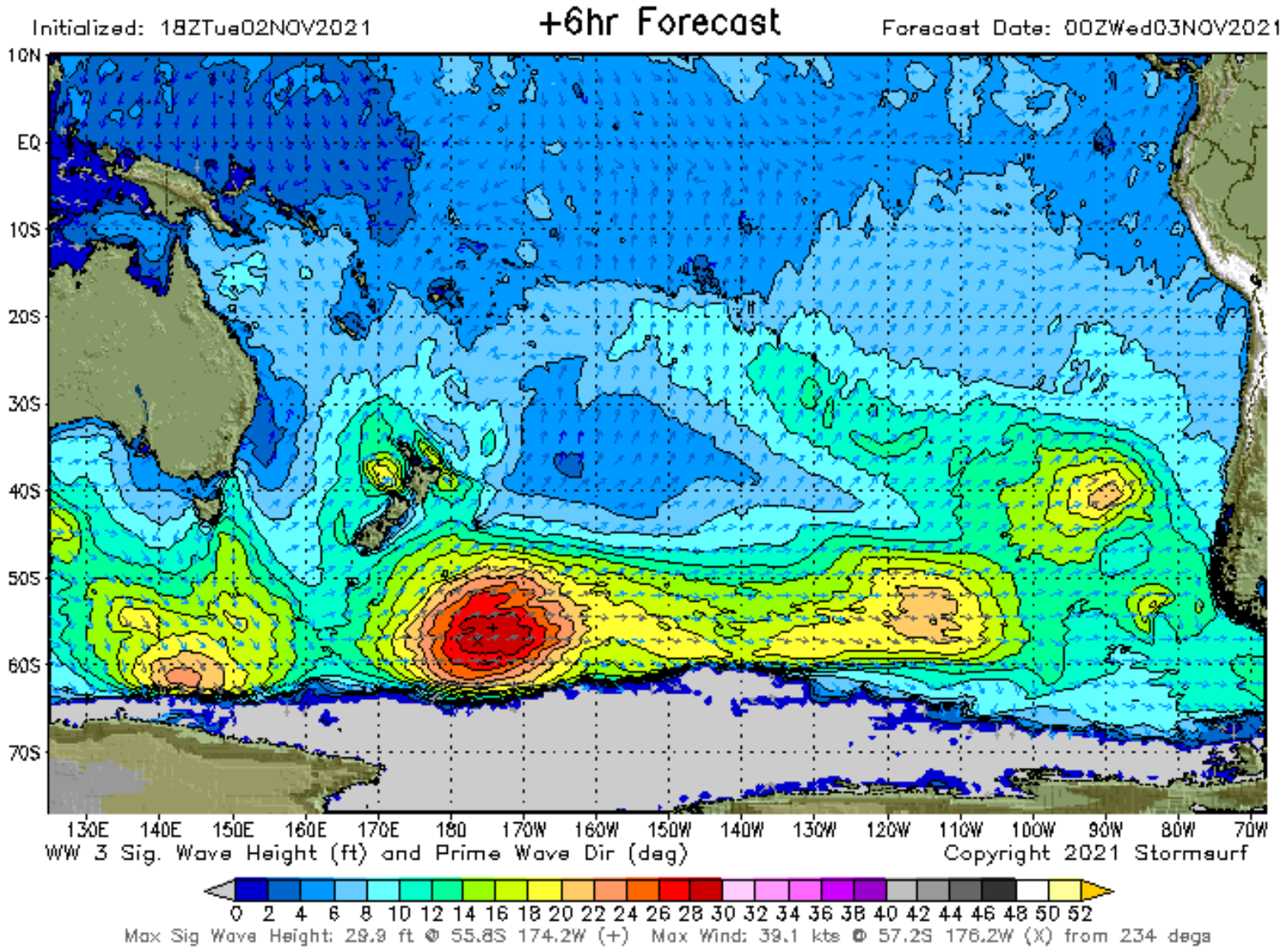
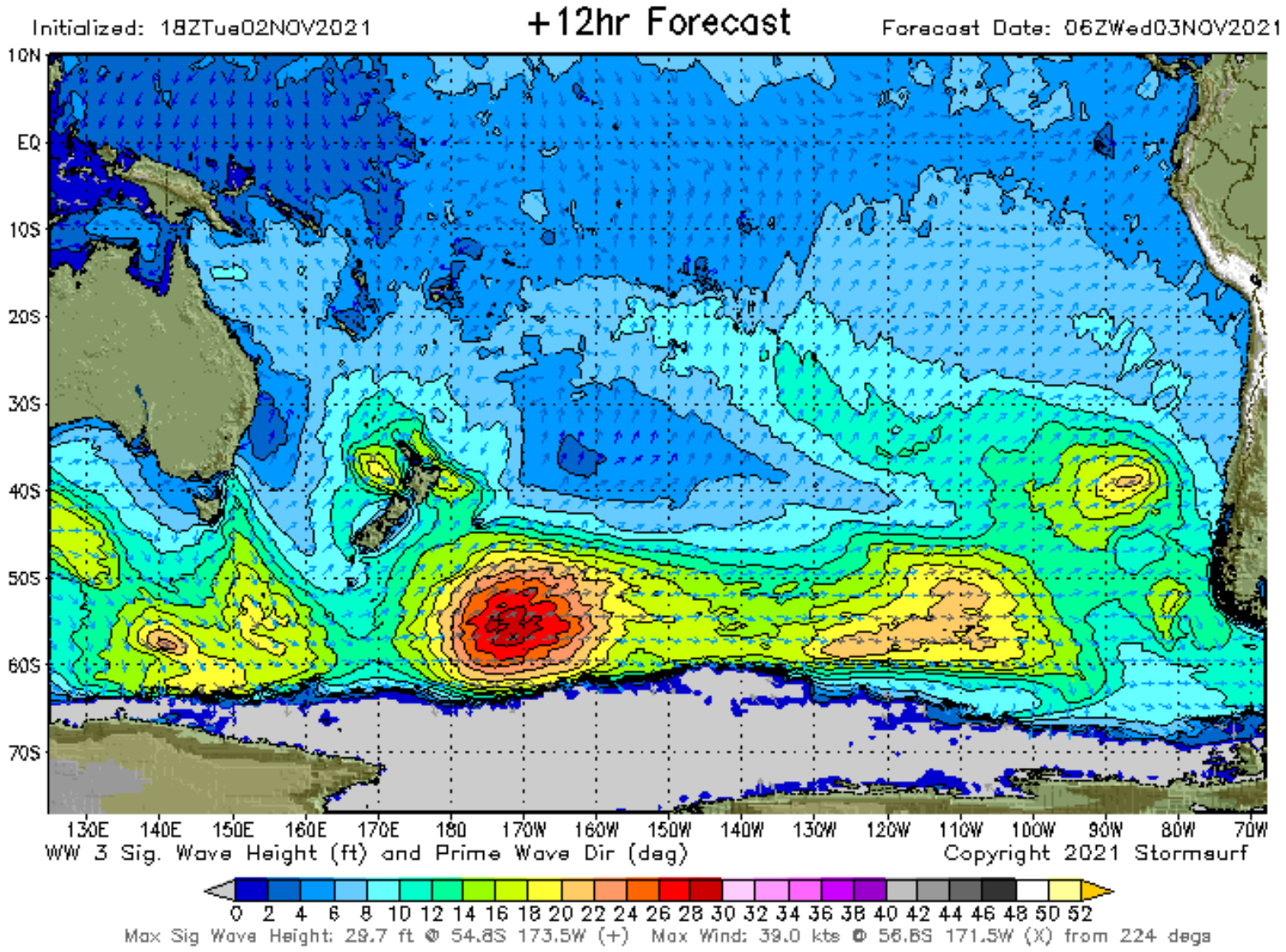
00hr Hindcast
Forecast Date: 18ZTue02NOV2021
10N
EQ
10S
20S
30S
40S
50S
60S
70S
130E 140E 150E 160E 170E 180 170W 160W 150W 140W 130W 120W 110W 100W 90W 80W 70W
WW 3 Sig. Wave Height (ft) and Prime Wave Dir (deg)
Copyright 2021 Stormsurf
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52
Max Sig Wave Height: 31.4 ft @ 56.8S 177.5W (+) Max Wind: 39.1 kts @ 57.2S 177.8W (X) from 242 degs

Ocean Waves

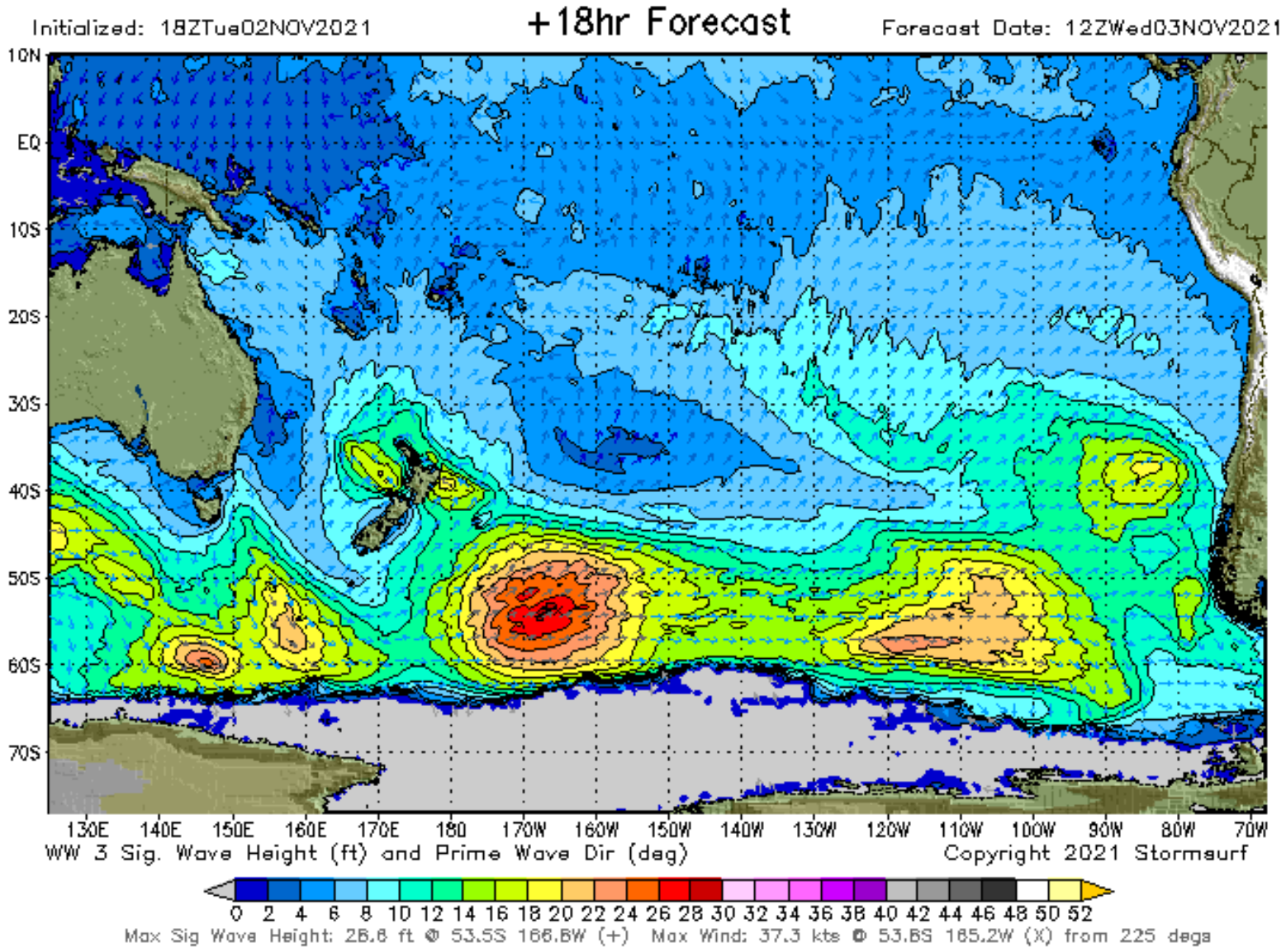

Initialized: 18ZTue02NOV2021
+6hr Forecast
Forecast Date: 00ZWed03NOV2021
10N
EQ
10S
20S
30S
40S
50S
60S
70S
130E 140E 150E 160E 170E 180 170W 160W 150W 140W 130W 120W 110W 100W 90W 80W 70W
WW 3 Sig. Wave Height (ft) and Prime Wave Dir (deg)
Copyright 2021 Stormsurf
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52
Max Sig Wave Height: 29.9 ft @ 55.8S 174.2W (+) Max Wind: 39.1 kts @ 57.2S 176.2W (X) from 234 degs

Ocean Waves



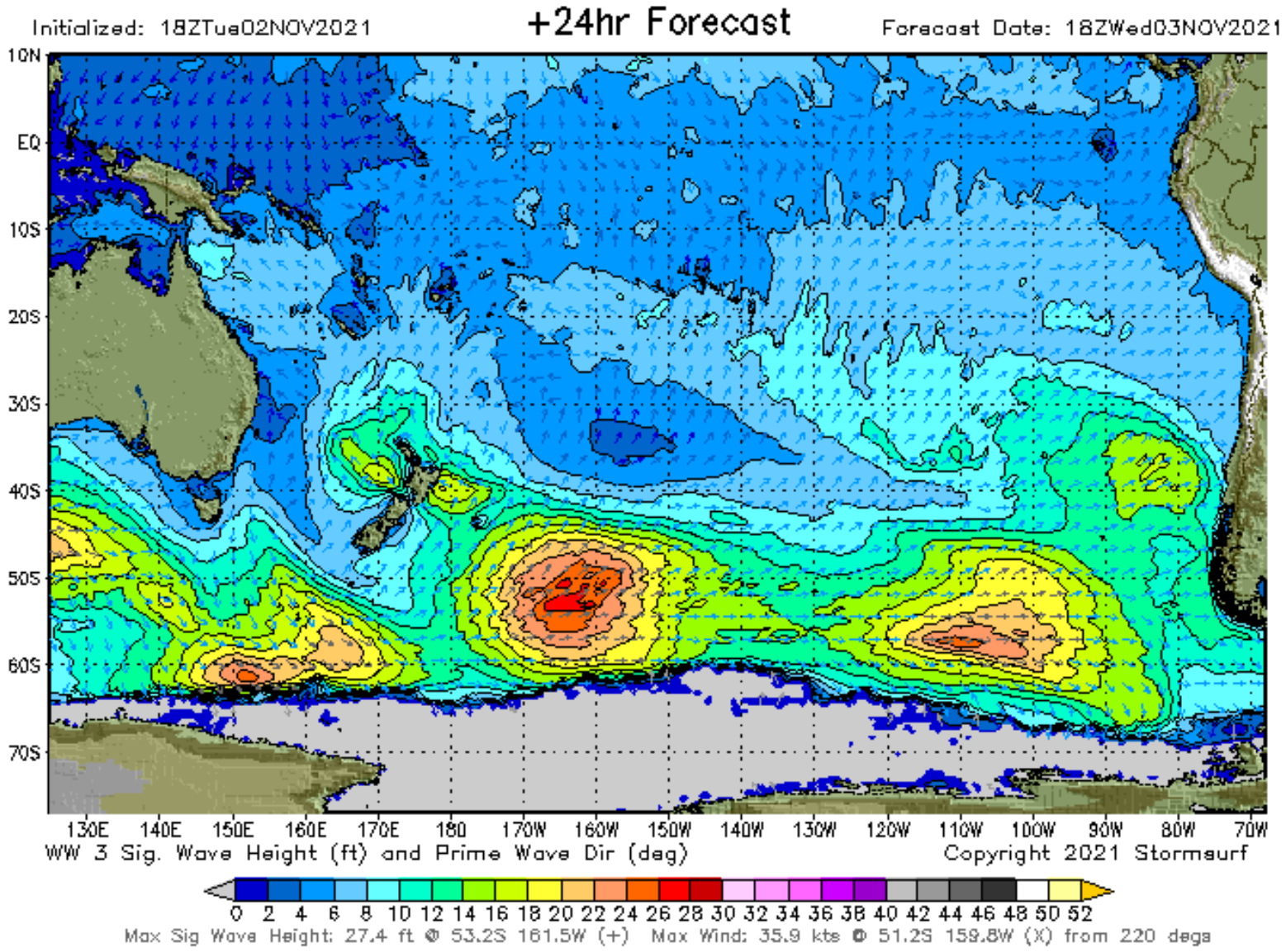
WAVEWATCH III, 2021

Ocean Waves



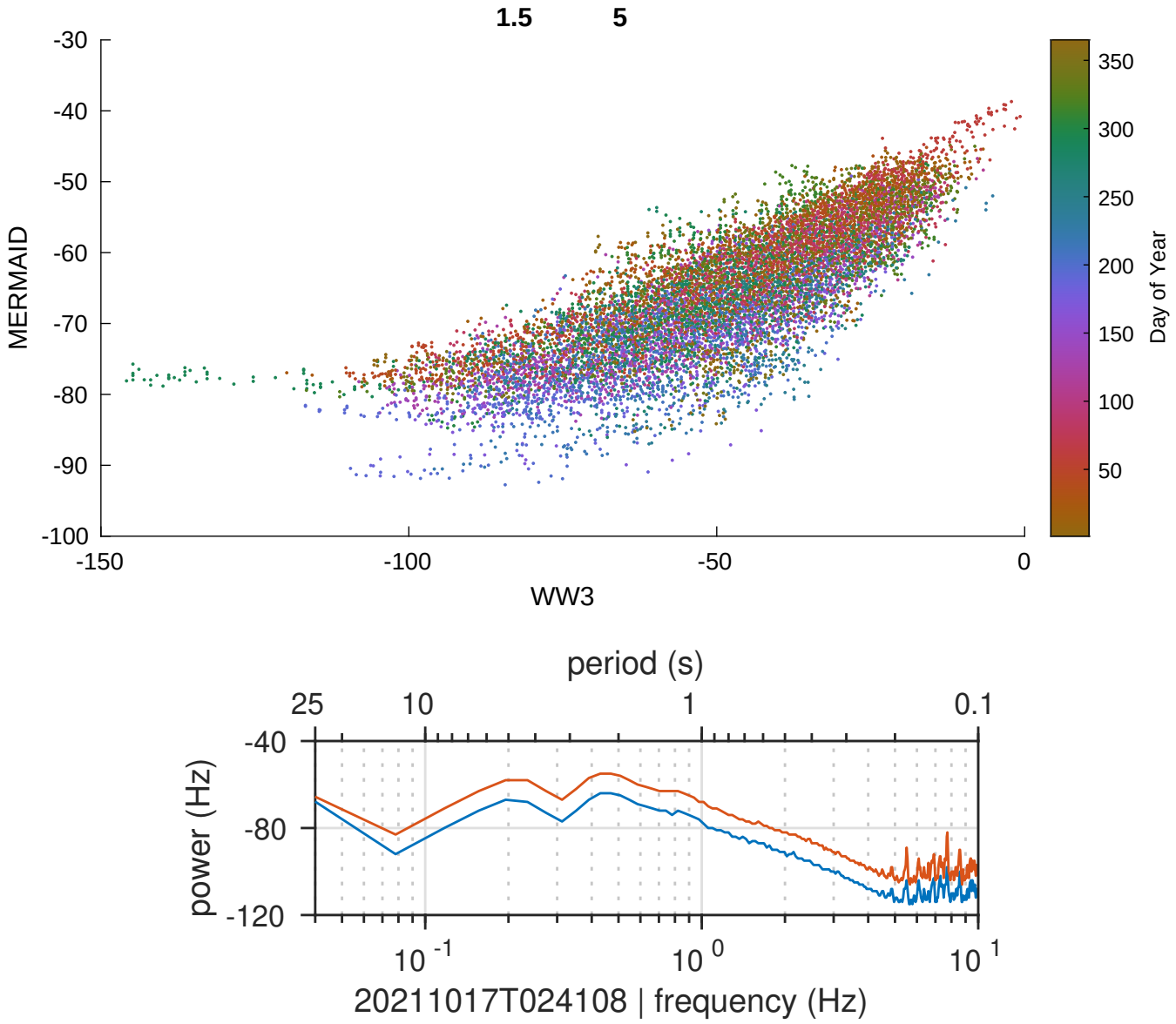
WAVEWATCH III, 2021

Ocean Waves

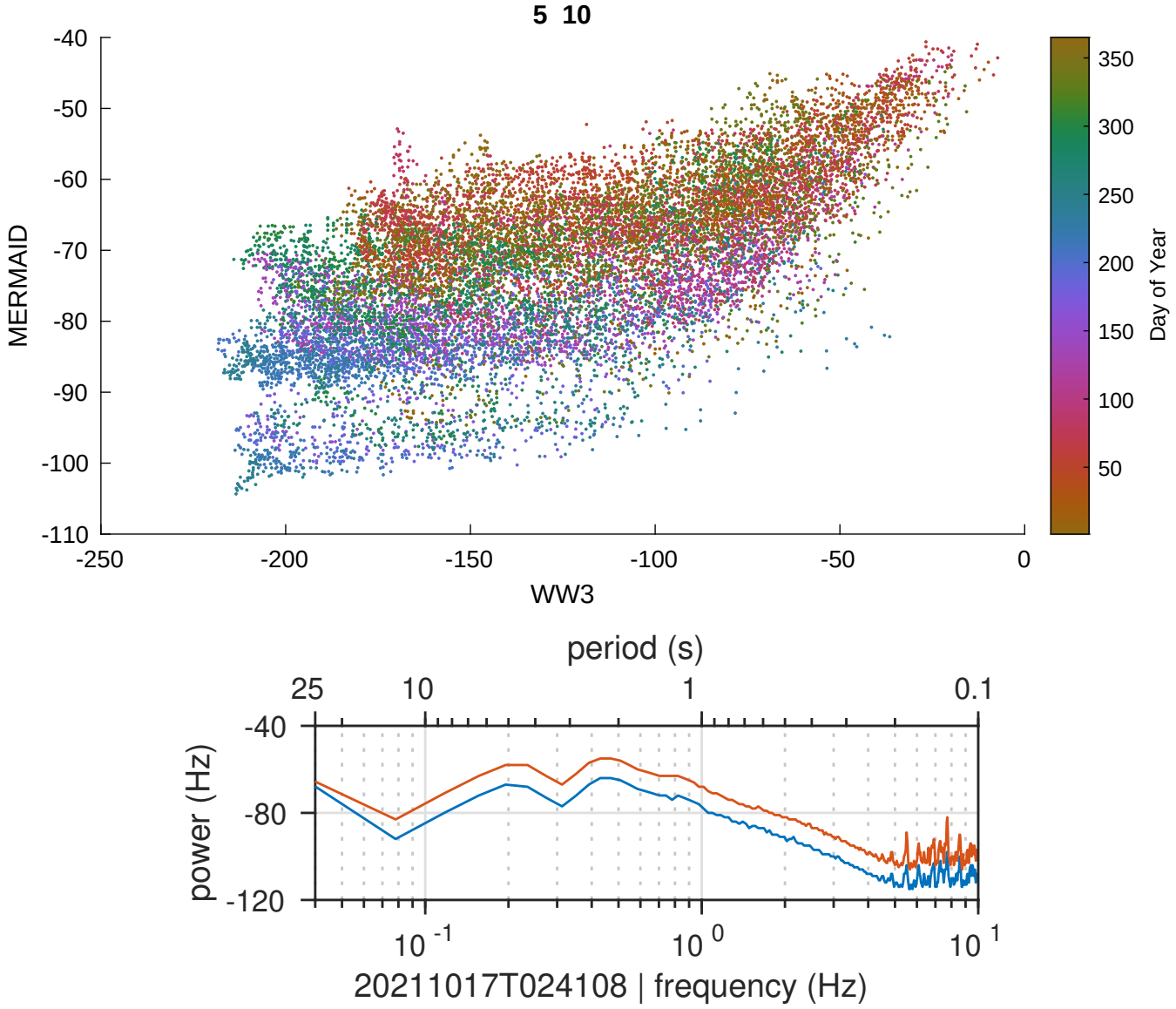


WAVEWATCH III, 2021

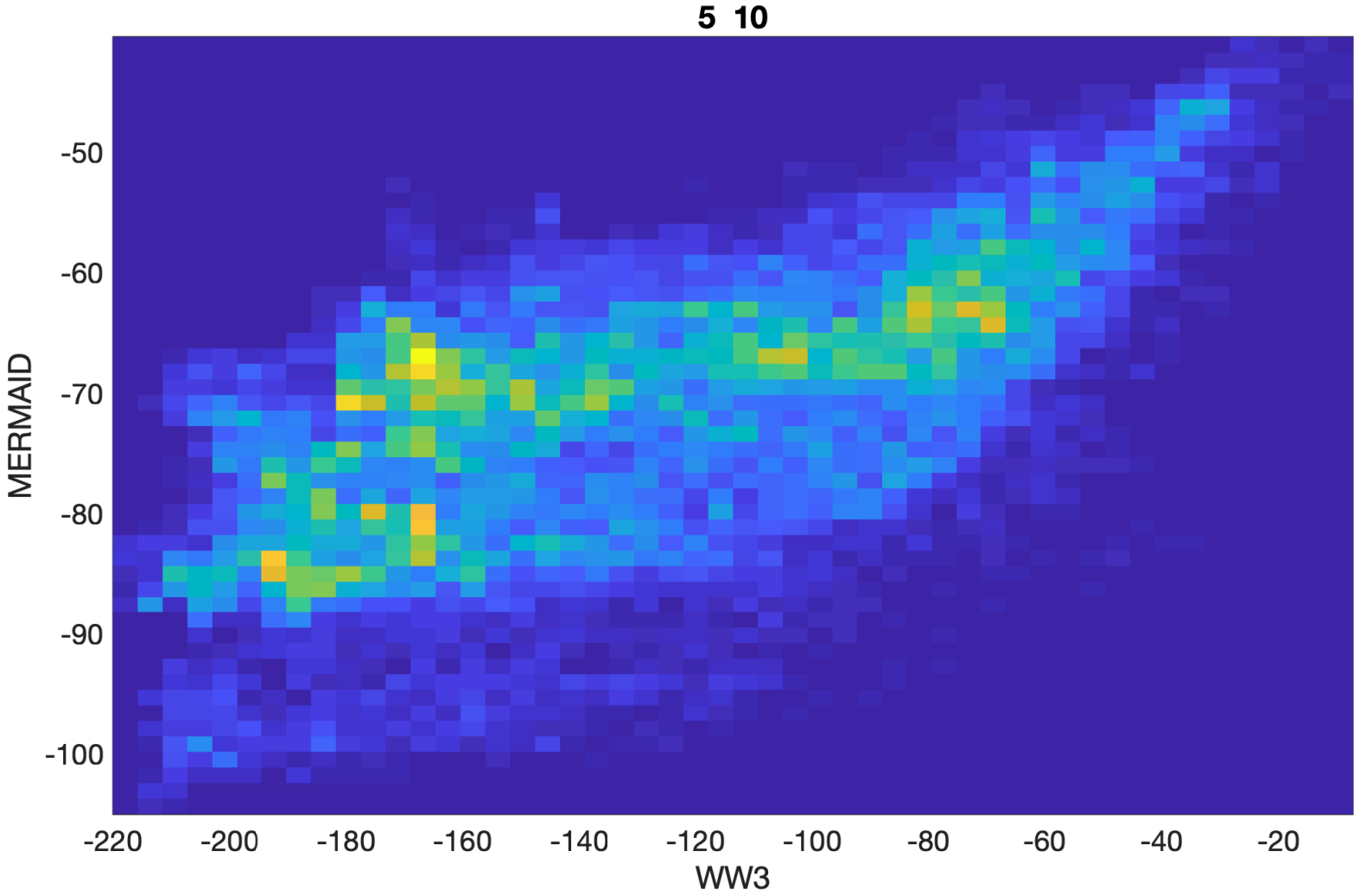
1–5 s secondary microseism



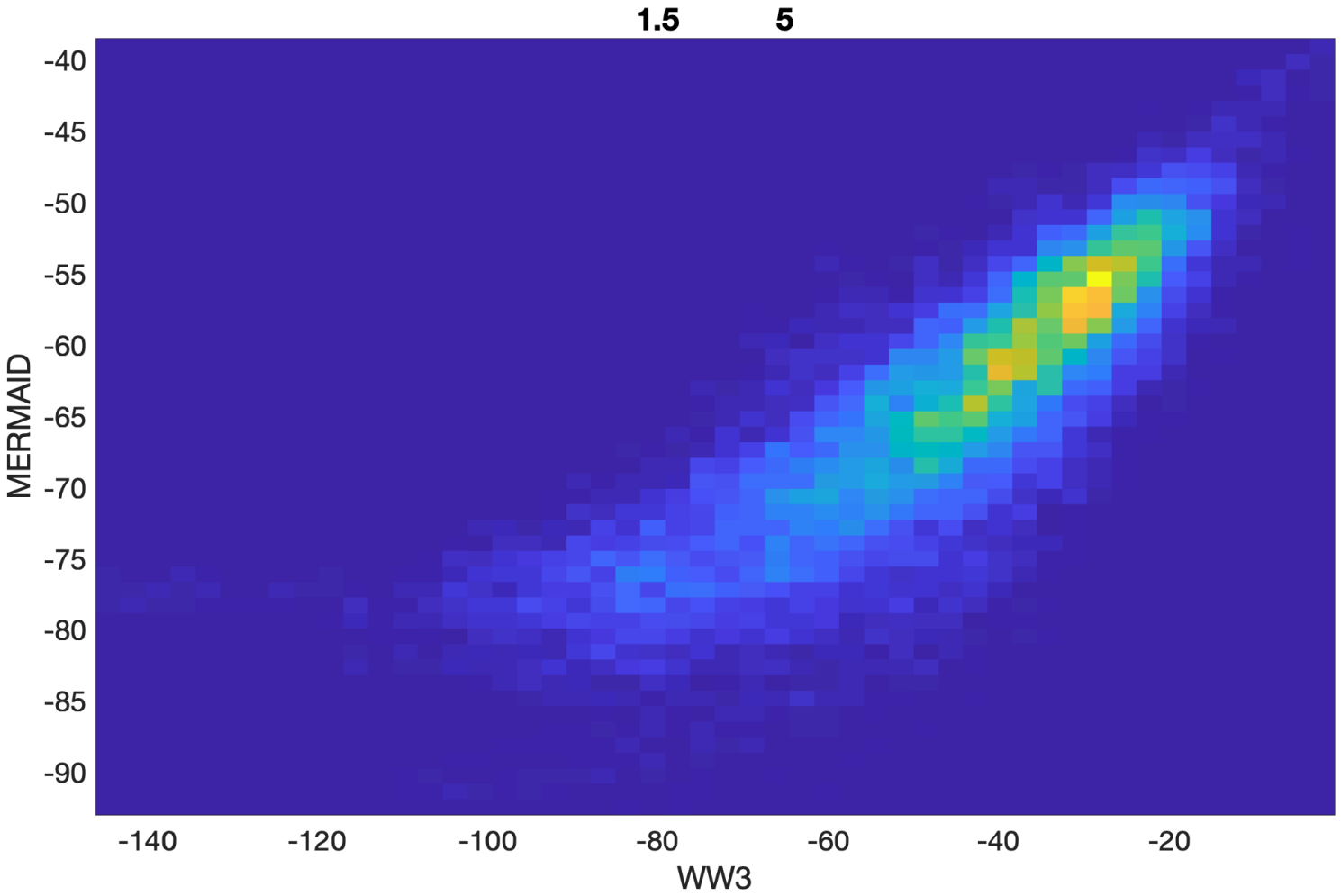
5–10 s secondary microseism



Match to wave models: 5–10 s



Match to wave models: 1–5 s



Conclusions

- Land-based seismic arrays need **oceanic** counterparts
- Floating MERMAID hydrophones record **earthquakes**

- Floating MERMAID hydrophones record **noise**
- Time-resolved infrasonic noise reveals **oceanic surface forcing**
- The **secondary microseismic** peak is well explained
  by a regional ocean model, especially between 1.5–5 s