Supplementary materials

a)

b)

c)

d)

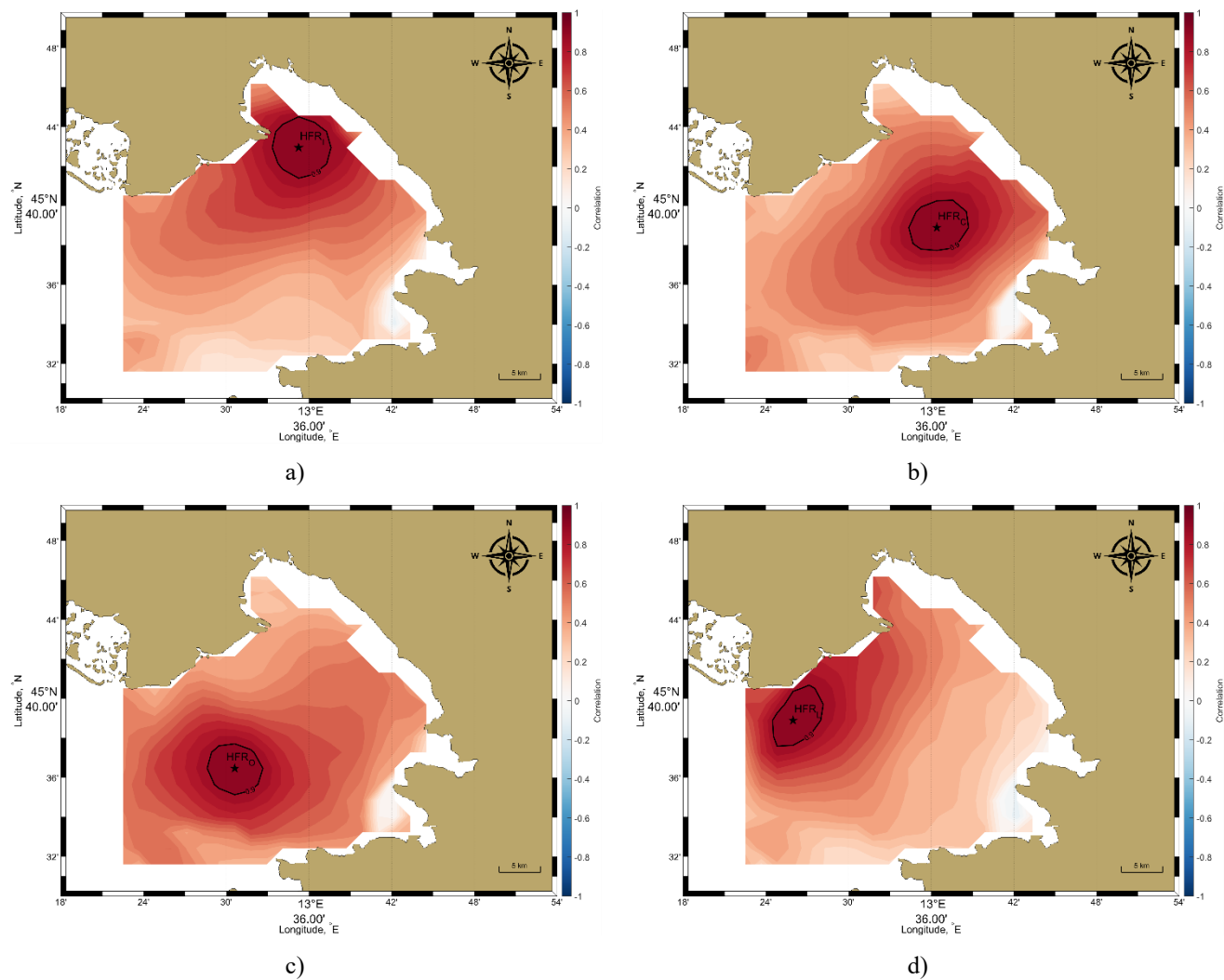



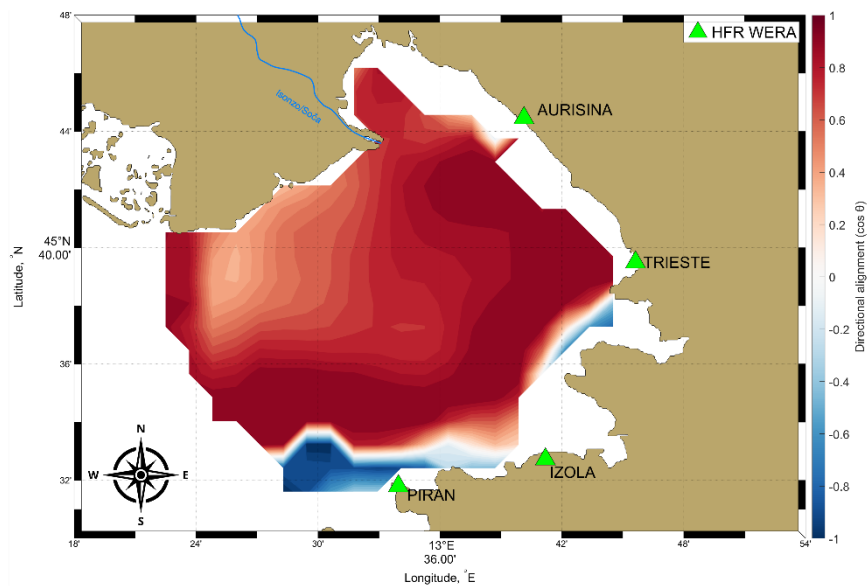
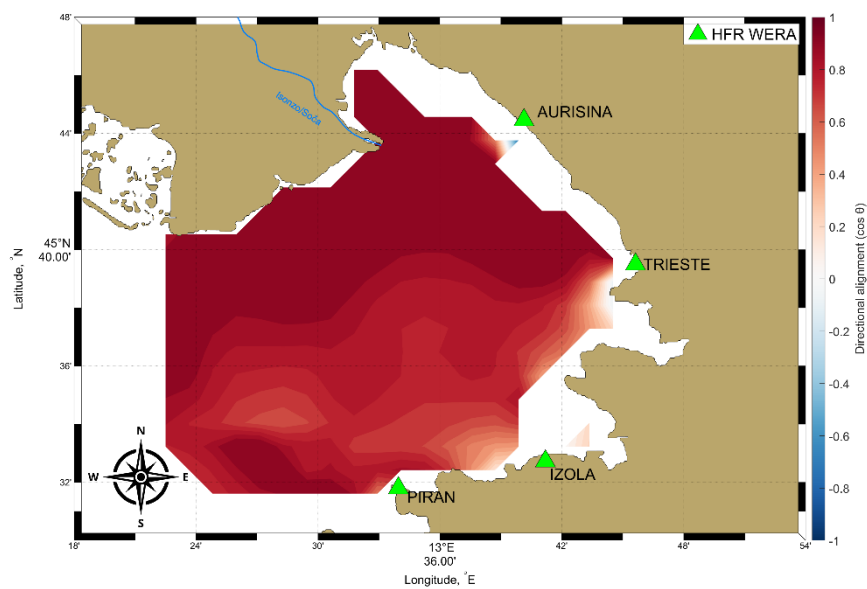
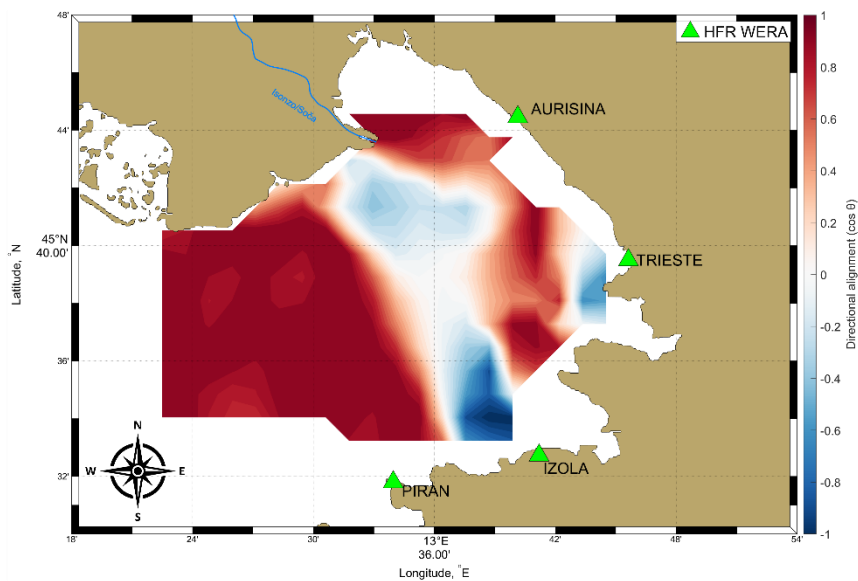
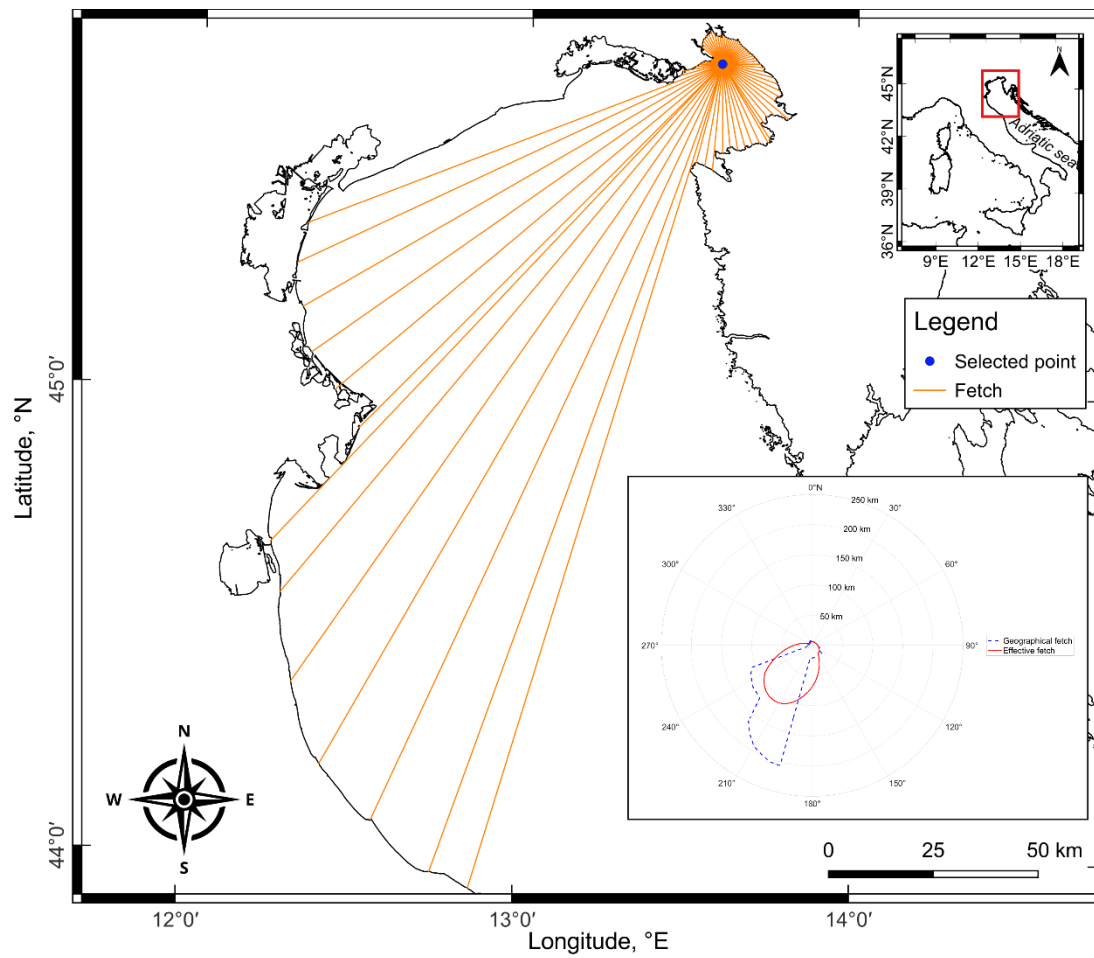
Figure S1: (a) Correlation map centred on HFR_I. (b) Correlation map centred on HFR_C. (c) Correlation map centred on HFR_O. (d) Correlation map centred on HFR_L.

a)

b)

c)

Figure S2: (a) Directional alignment (cos θ) map on 15th October 2023 19:00 UTC (Bora event). (b) Directional alignment (cos θ) map on 27th October 2023 05:00 UTC (Southerly wind event). (c) Directional alignment (cos θ) map on 28th October 2023 01:00 UTC (Southerly wind and strong river outflow event).

10   **Figure S3: Fetch and selected point.**

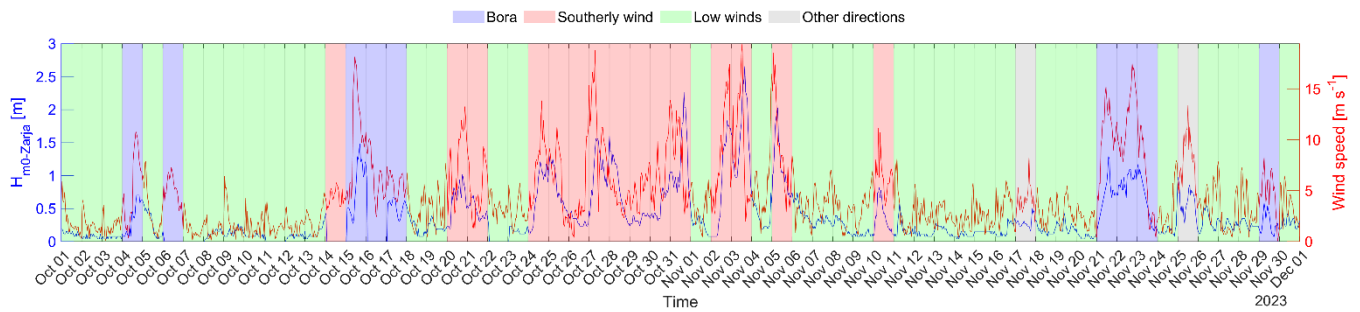



Figure S4: Time series of significant wave height, H$_{m0-Zarja}$, from Zarja wave buoy (blue), wind speed in WRF$_O$ point (red). The coloured bands represent the same (daily averaged) wind regimes described in the previous paragraph, extracted from the WRF$_O$
15   **point.**

a)

b)

c)

d)

Figure S5: Coastal storm (a-b) and storm damage (c-d) in Barcola coast from https://www.triesteprima.it/foto/cronaca/mareggiata-a-barcola-i-danni-4-novembre/.