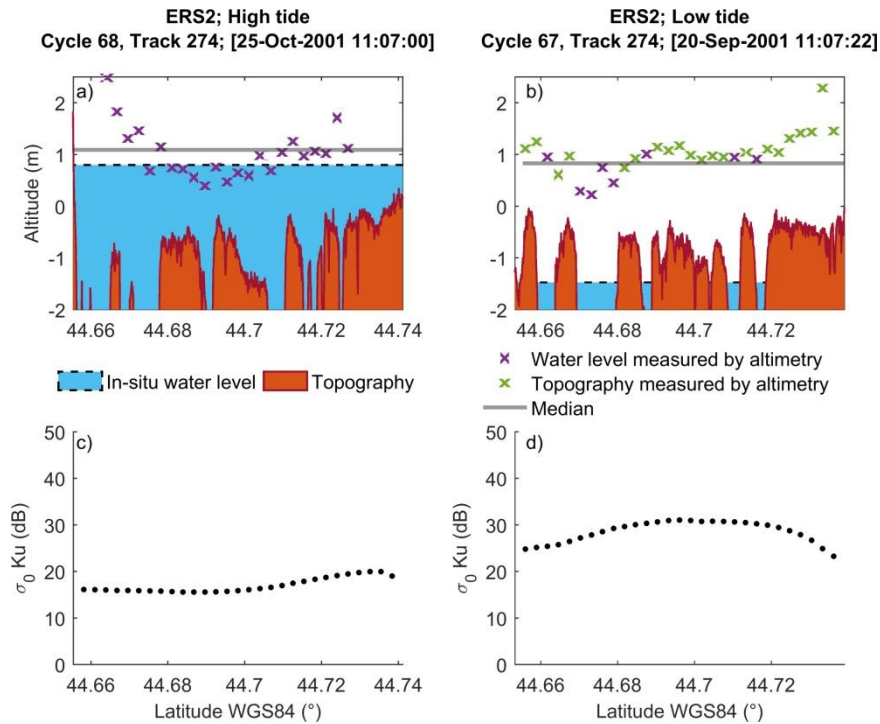


*Supplementary Materials:*

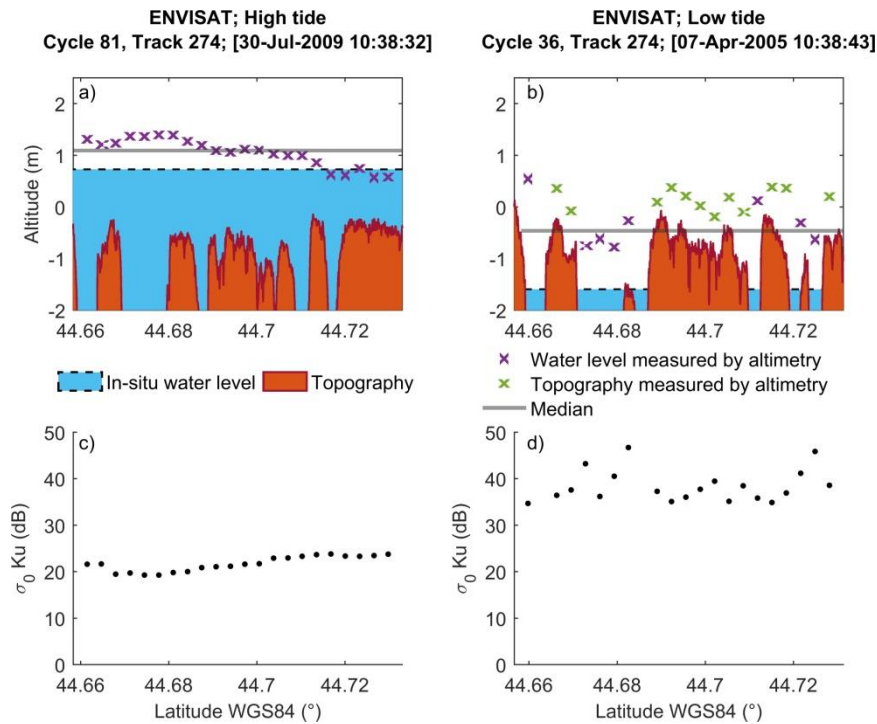
## **Monitoring sea level and topography of coastal lagoons using satellite radar altimetry: the example of the Arcachon Bay in the Bay of Biscay**

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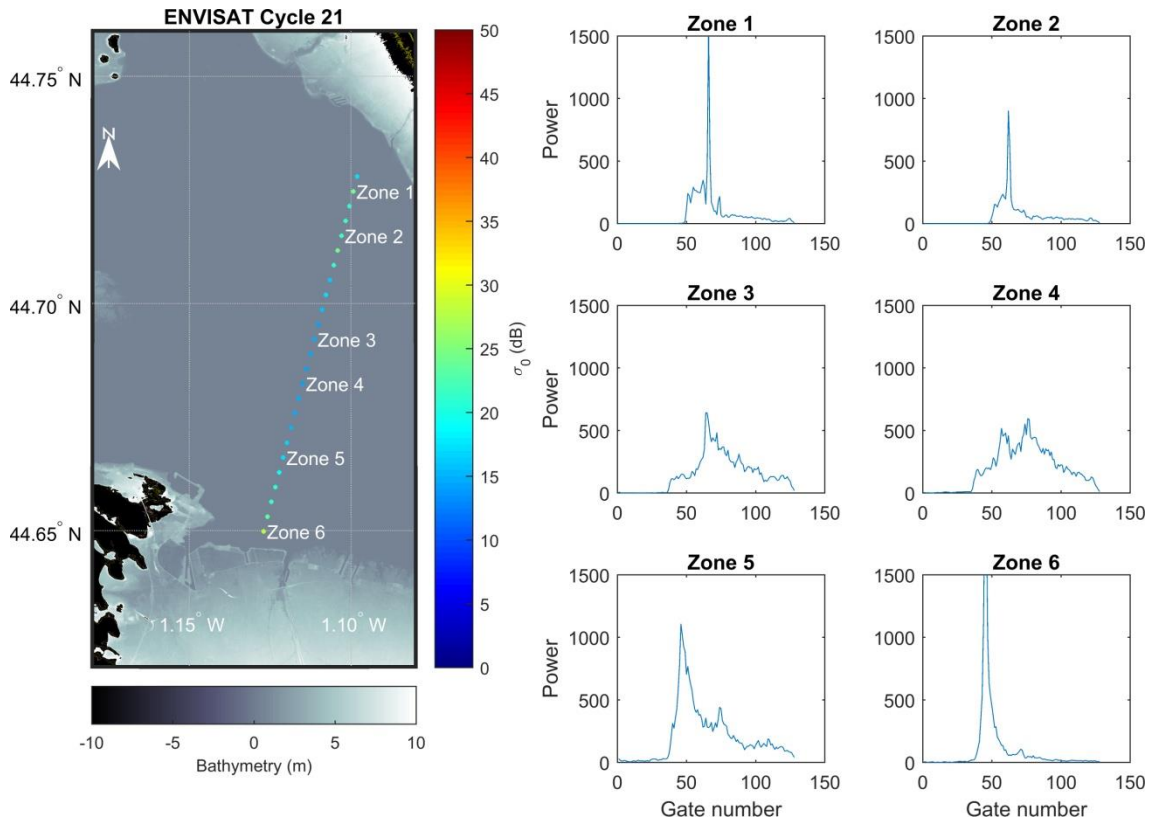
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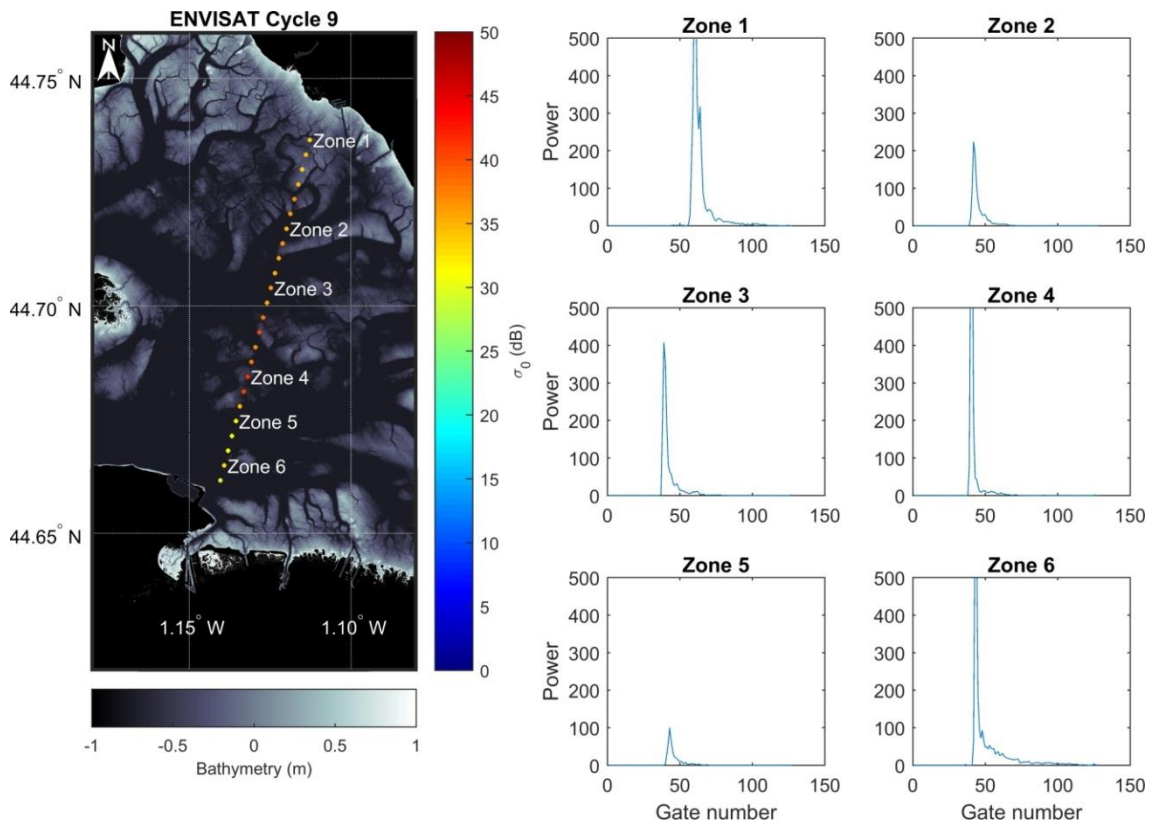
**Figure S1.** (a, b) Examples of ERS-2 along-track profiles of altimetry height over water (purple crosses) and land (green crosses) at high (a) and low (b) tides, the topography under the altimeter ground track is represented in brown and it is filled with water (in blue) using leveled tide-gauge records; (c, d) Variation of Ice-1 backscattering coefficients of Ku-band (black dots) at high (c) and low (d) tides.



**Figure S2.** (a, b) Examples of ENVISAT along-track profiles of altimetry height over water (purple crosses) and land (green crosses) at high (a) and low (b) tides, the topography under the altimeter ground track is represented in brown and it is filled with water (in blue) using leveled tide-gauge records; (c, d) Variation of Ice-1 backscattering coefficients of Ku-band (black dots) at high (c) and low (d) tides.



**Figure S3.** Spatial variation of the backscattering coefficient for ENVISAT (cycle 21) at high tide along with the corresponding waveforms of the indicated zones.



**Figure S4.** Spatial variation of the backscattering coefficient for ENVISAT (cycle 9) at low tide along with the corresponding waveforms of the indicated zones.