

# A database of Black Sea Beaches

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GI4 – Atmosphere and ocean monitoring  
GI4.1 Open session on atmosphere and ocean monitoring

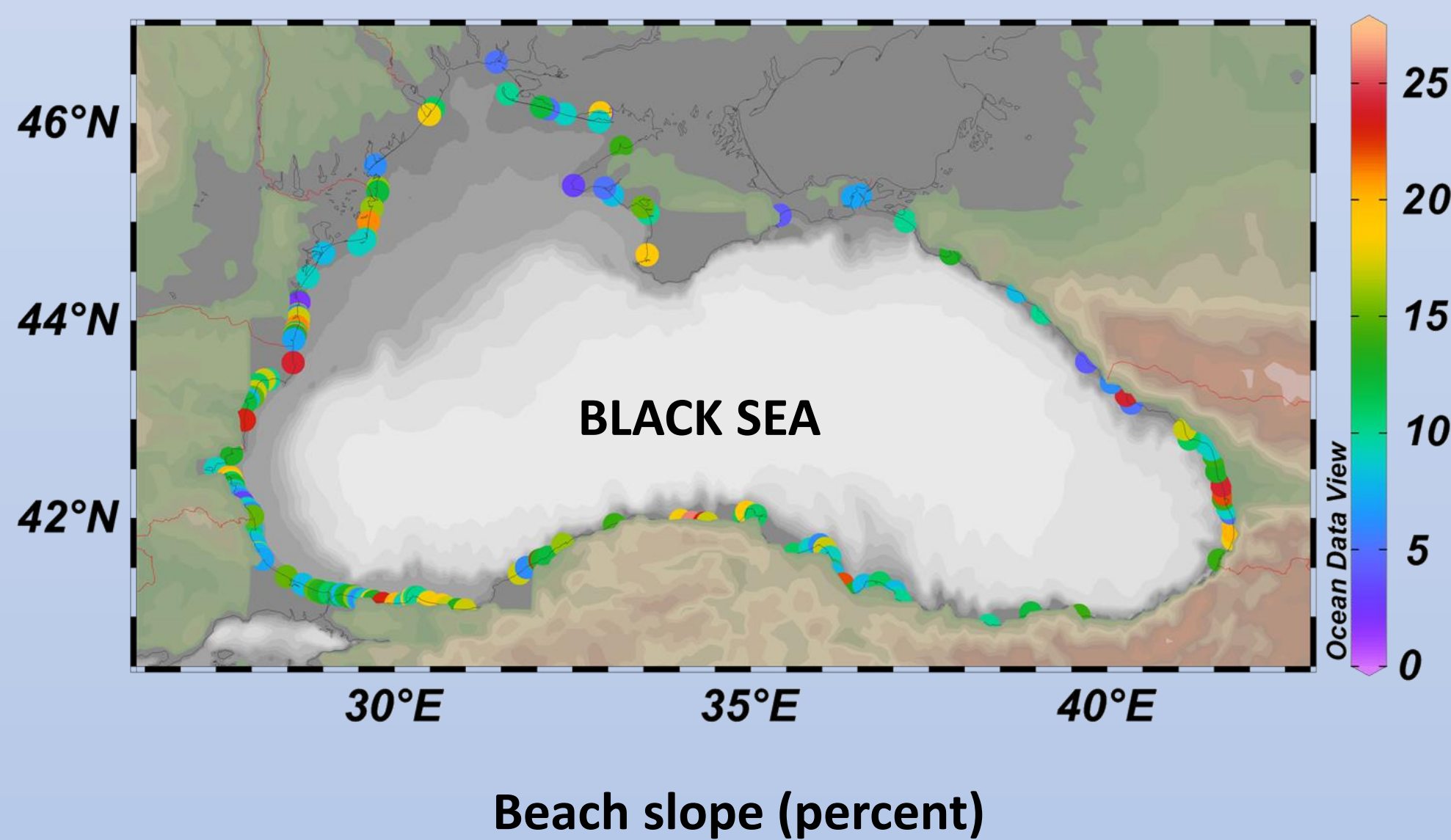
In this study, a database for all the beaches along the Black Sea coastline is created to help the efforts on marine conservation and coastal management. 1553 beaches have been digitized as polygons using satellite images between 2013 and 2016 covering the entire Black Sea coast.

## Geometric properties

Results indicated that Black Sea beaches are relatively narrow. Most of them are either experienced erosion or have a vulnerability to erosion. Among all 1553 beaches, only 28 beaches have an average width wider than 100 m. In the basin, the average width of the beaches is 26.04 m, the average beach area is 70384 m<sup>2</sup> and the total beach shoreline length is 2116 km, which covers 43% of the Black Sea coastline.

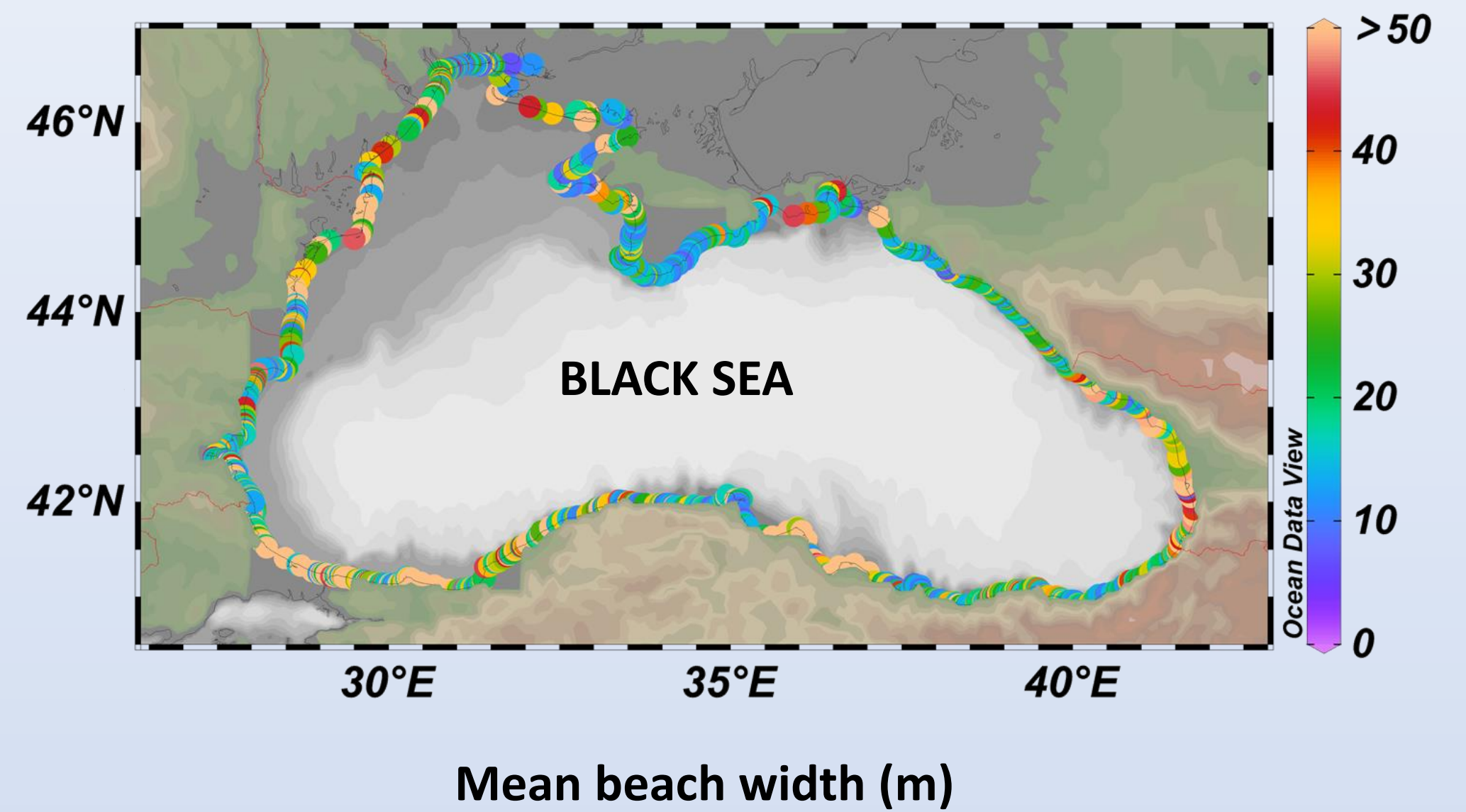
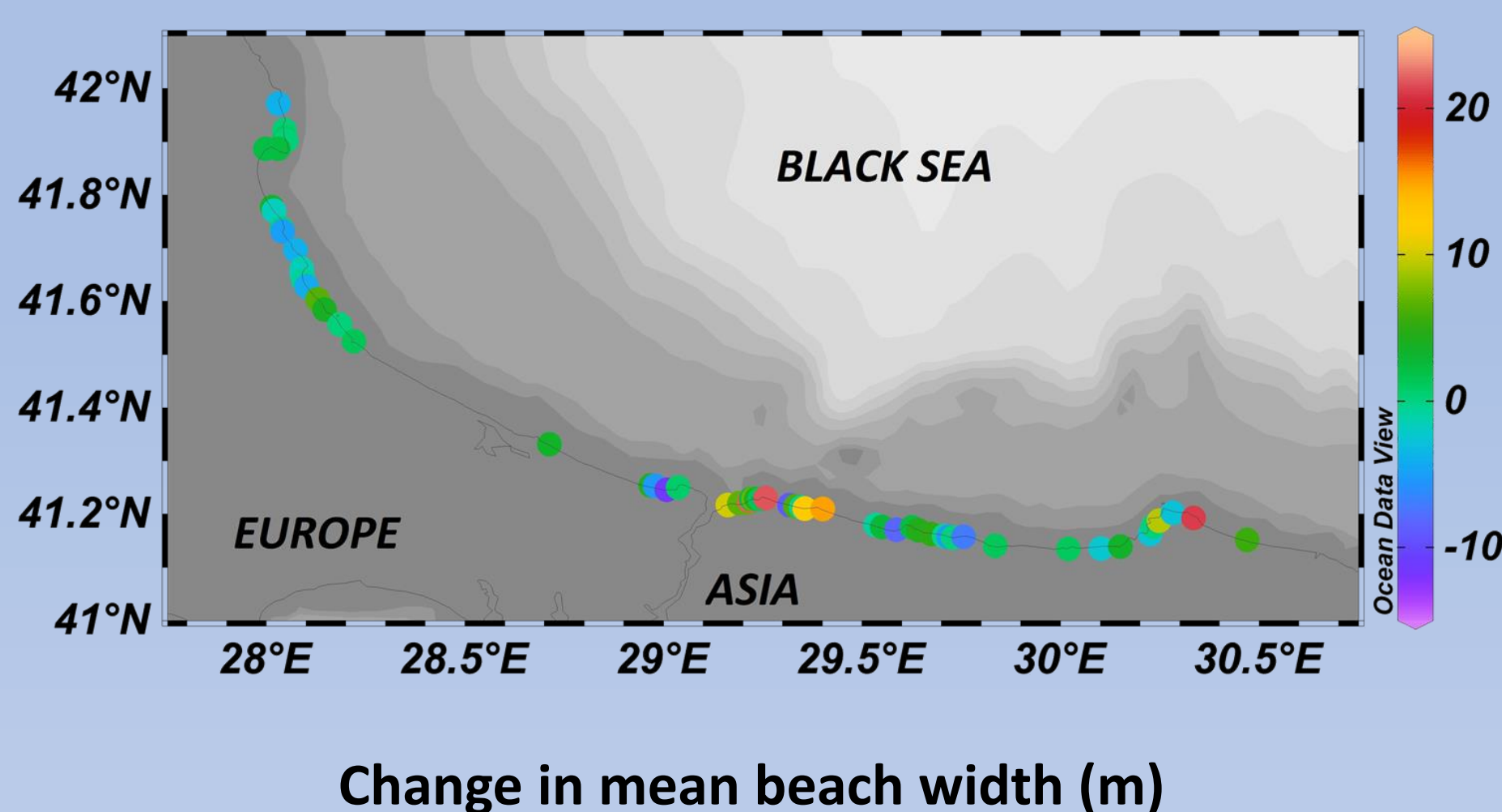
## Slope

The mean slope values of the beaches with a maximum width of greater than 100 m are calculated using ASTER DEM v2. Mean slope for these 164 beaches was 12.6 percent.



## Short-term erosion

An additional analysis is performed by creating a different layer for the South-western part of the basin, from two images approximately 5 years-apart. This analysis showed that, even in the short-term, beaches can experience significant area loss reaching up to 50% in a relatively high wave climate such as exists in the South-western part.



Geometric properties of beaches for riparian countries

	Mean area (m <sup>2</sup> )	Length < 1 km (%)	Mean width (m)	Total Shoreline length (km)	Mean shoreline length (m)
<b>Turkey</b>	84009	81	31	643	1031
<b>Georgia</b>	154709	42	32	288	3940
<b>Russia</b>	37332	74	20	217	1126
<b>Ukraine</b>	63198	75	20	636	1571
<b>Romania</b>	143976	96	37	173	3451
<b>Bulgaria</b>	27683	84	24	169	803

Number of natural features for riparian countries

	Beaches counted and digitized	Estuaries counted and marked	Harbors counted and marked
<b>Turkey</b>	624	324	140 (mostly fisheries)
<b>Georgia</b>	72	108	6
<b>Russia</b>	72	71	24
<b>Ukraine</b>	405	28	30
<b>Romania</b>	50	4 (Danube as 1)	5
<b>Bulgaria</b>	209	39	18

## Coastal structures

Nearly half of the Black Sea beaches have no coastal structure; and for the structured beaches, coastal protection is mostly provided with hard structures. 397 groins, 306 revetments and/or seawalls, 233 piers, 111 breakwaters, 58 off-shore breakwaters and 38 jetties are located inside or adjacent to the beach polygons.

