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## Comparing impact effects of common storms and Medicanes along the coast of Southeastern Sicily

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The coastal vulnerability along the Mediterranean coasts is increasing, especially in response to the occurrence of tropical-like events, known as Medicanes, which have become more intense than in the past. A peculiar case was the impact of Medicane Zorbas occurred in September 2018 along the coasts of Southeastern Sicily, where it caused inland flooding and damages to the socio-economic activities. We reconstructed Zorbas effects through post-event geomorphological surveys, interviews to direct witness and analyses of video recorded by surveillance systems or found in the social media. These data allowed to assess the flooding extent on seven coastal sectors located between Thapsos Peninsula and Marzamemi. Flooding caused by Zorbas appears to be greater than those surveyed after the main seasonal storms occurred in the areas from 2015 to 2019, but comparable with the flooding generated by Medicane Qendresa that impacted the southeastern Sicily in 2014. Waves propagation modelling was performed through Delft 3D for the main marine extreme events occurred in the area since 2005, and analyses of data recorded by tide gauge of Catania and Porto Palo di Capo Passero and Malta since 2008 let us to hypothesize that Medicanes generate greater flooding than seasonal storms because they can induce higher and longer surge along the coastline. Collected data indicate that surge generated by Zorbas reached a maximum value between about 0.8 m and 1.2 m above mean sea level (msl) along the coast of southeastern Sicily. Results highlighted the need to better evaluate the coastal hazard related to the propagation of Medicanes, especially in the context of future climate change, when these events could be characterized by a longer duration and a greater intensity than the present, such to cause greater flooding and damage to the coastal areas.

Keywords: coastal flooding; storm wave; storm surge; Medicane; vulnerability.