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From drought to Storm Daniel: an overall assessment on the fragility of the Mediterranean region

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In 2022, Europe experienced an unprecedented drought. 2023 marked the warmest year globally on meteorological records, leading to droughts and wildfires in Greece during the summer. In July 2023, certain areas of the Mediterranean experienced sea surface temperatures 5.5°C higher than the annual average, contributing to severe summer heatwaves and wildfires in the Greek region. These conditions also provided ample thermal energy for the formation of Storm Daniel. From September 4th to 6th, Storm Daniel struck Greece, resulting in significant rainfall and flooding. Coordinated satellite monitoring revealed that the flooded area in central Greece reached 875.28 km². On September 10th, Storm Daniel hit Libya, leading to dam collapses and claiming the lives of over 11,000 people. Concurrently, the flood area in the northern deserts of Libya exceeded 1,000 km². From a global perspective, Europe has witnessed an increased frequency of extreme droughts and floods in recent years, while North Africa grapples with geopolitical instability. Climate change-induced natural disasters are further heightening the vulnerability of the Mediterranean region. Consequently, this study underscores the importance of (1) enhancing hydrological monitoring in arid and semi-arid regions of the Mediterranean, (2) developing a Mediterranean scale early warning system, and (3) stressing the imperative for the European Union and North African countries to collaboratively establish climate change adaptation strategies, aiming to avert humanitarian disasters triggered by climate crises.