



## Storm Daniel and the timing and magnitude of floods in Northeast Libya

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Storm Daniel caused major flooding throughout much of the Jebel al-Akhdar massif in Northeast Libya, leading to huge damage and loss of life in the city of Derna and widespread damage to infrastructure through the region in September 2023. There is little historical record of significant floods in the region. We conducted dendrogeomorphological and palaeohydrological research in the wadis Kouf and Bottamsa in the Jebel al-Akhdar. Radiocarbon- and tree-ring dated flood return and flood magnitude sequences suggest three major floods during the 17<sup>th</sup> to 19<sup>th</sup> centuries AD in the Wadi Kouf and one major flood during the 18<sup>th</sup> Century in the Wadi Bottamsa, with major flood return intervals of about one per 100 years. The timing of the major floods in these two catchments seem to be different, suggesting the storms that caused them were localised. The major floods in the Wadi Kouf would have been large enough to have caused considerable damage to modern infrastructure, which seems to have been designed to cope with the much smaller floods of the mid-20<sup>th</sup> Century. Storm Daniel, however, was the product of a much larger weather system than the storms that gave rise to the earlier floods and it caused the largest floods in these wadis in the last 400 years.