Anatomy of a Flash Flood in a Hyperarid Environment: From Atmospheric Masses to Sediment Dispersal in the Sea

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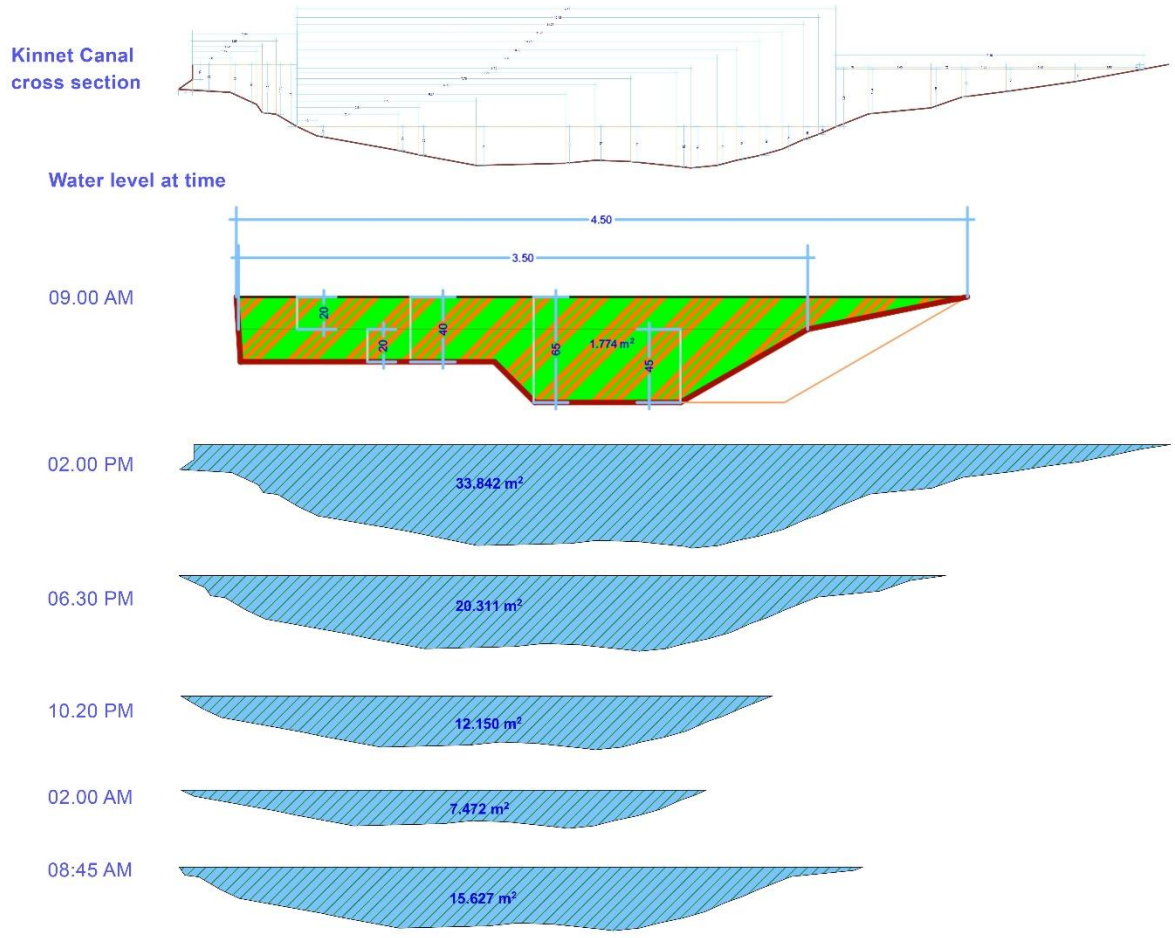
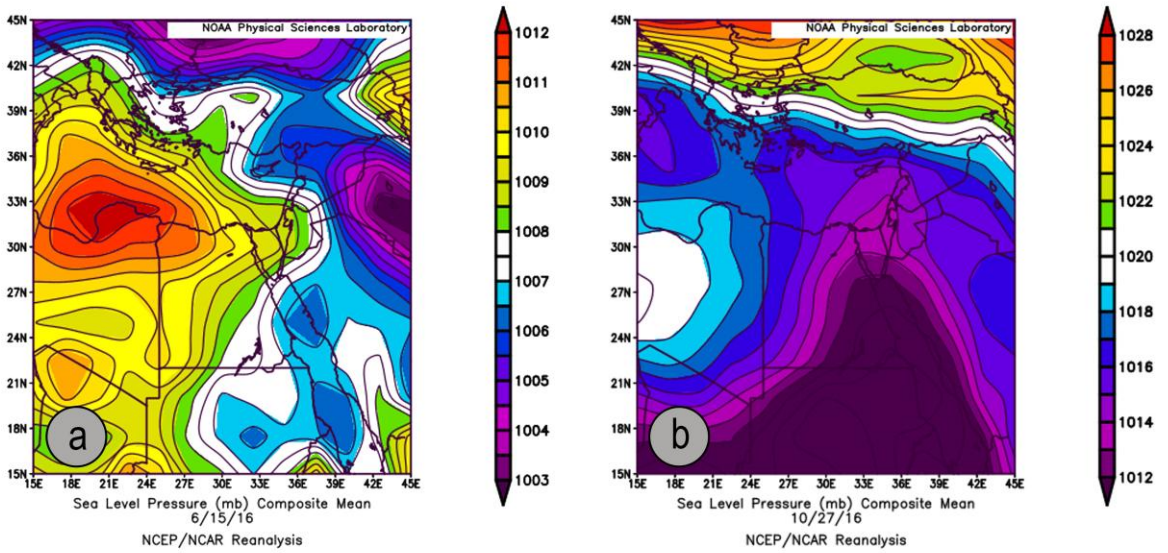
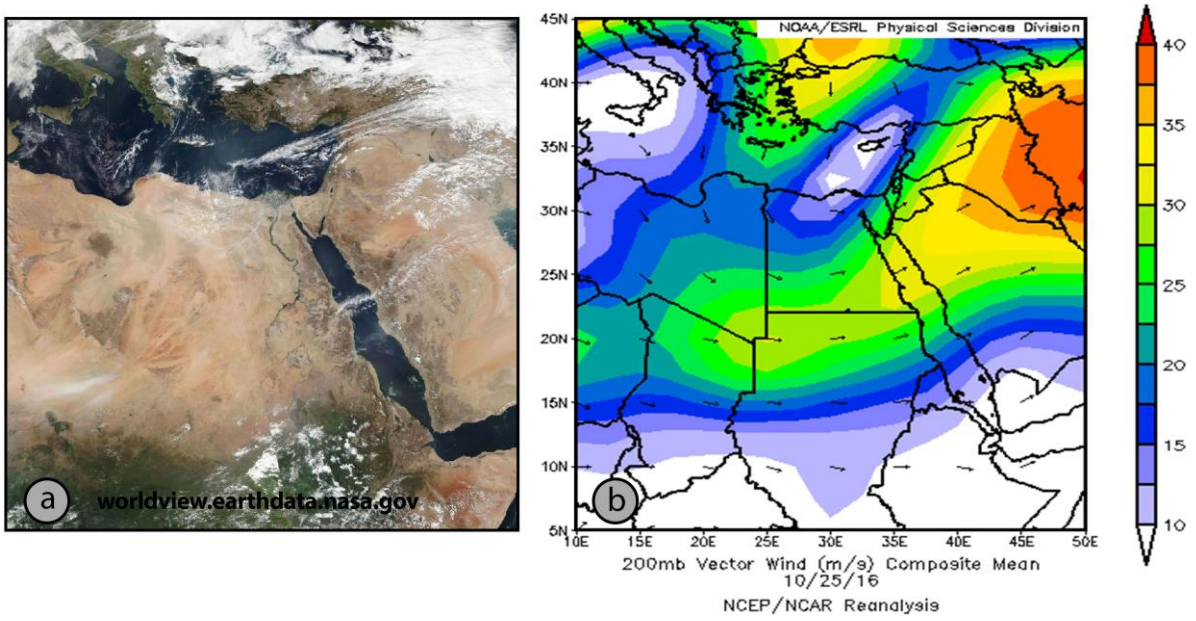
Supplementary Figures



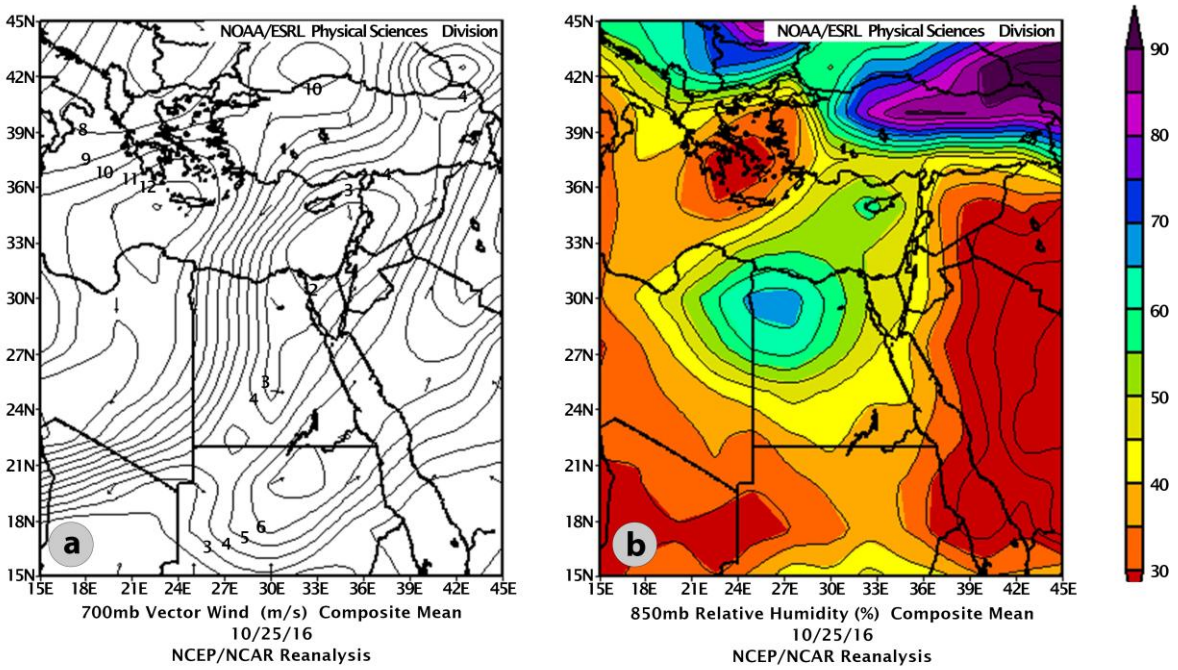
Supplementary figure 1: Cross-section areas (m^2) of the Kinnet Canal measured at 3-hour intervals throughout the flood event. Flood levels along the banks were recorded regularly during the event, allowing for post-flood reconstruction of water stage and corresponding cross-sectional area over time.



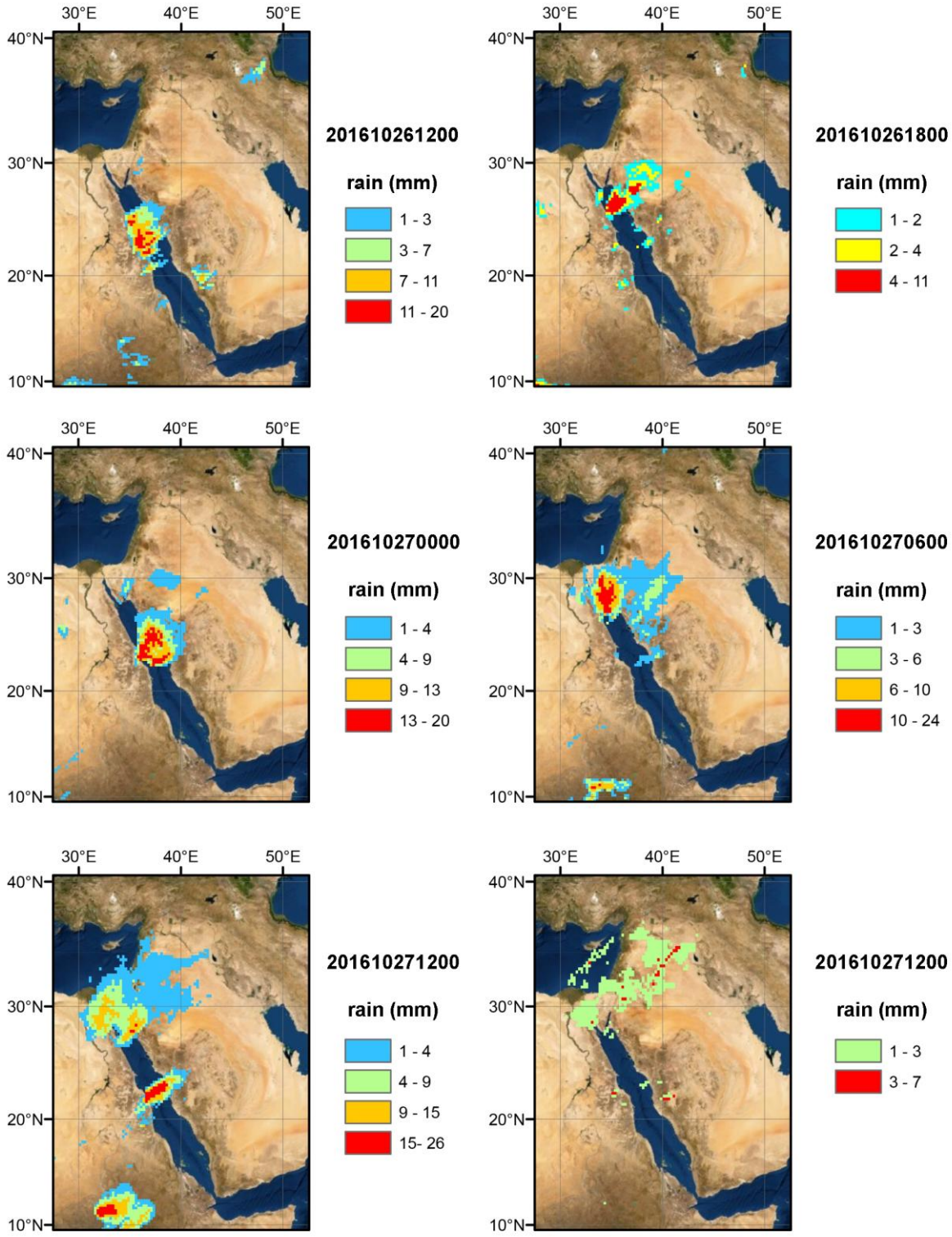
Supplementary figure 2: Sea-level pressure patterns over the Red Sea in two cases. (a) A summer scenario without the presence of the Red Sea Trough (RST). (b) A case where the RST is present on the flooding day in Eilat, illustrating its influence on regional pressure distribution.



Supplementary figure 3 Influence of the subtropical jet (STJ) on cloud formation. (a) Satellite image showing cloud cover over the mid-Red Sea. (b) 200 hPa vector wind composite map indicating that the observed clouds formed due to the intensification of the STJ.



Supplementary figure 4: Moisture transport towards the Red Sea. (a) 700 hPa vector wind composite map showing the wind flow patterns. (b) 850 hPa moisture map indicating that moisture was transported at this level from the Libya-Egypt border toward the Red Sea.



Supplementary figure 5: Advancement of precipitation centers. PERSIANN data with a 0.25° x 0.25° spatial resolution showing the movement of precipitation centers from the mid-Red Sea towards the northern tip of the Gulf of Aqaba-Eilat. Over the course of a day, these precipitation centers advanced approximately 1000 km, reaching Eilat, where the rainstorm triggered a flash flood that eventually drained and transported sediment into the sea.