



2023-09-07, Sentinel-2



2023-09-12, Sentinel-2

In September 2023, storm Daniel caused a severe flooding crisis in the region around Derna, a coastal city in Libya. Satellite images captured the extent of the disaster, showcasing large areas submerged under water, the change in the vegetation and the increased sediment load of the sea water after the event.

The heavy rainfall associated with this event was unprecedented, with rainfall levels surpassing 200 millimetres in just 48 hours. This led to the collapse of two dams regulating the water flow in the upstream part of the valley. The city's inadequate infrastructure and urban planning exacerbated the situation, making it more susceptible to flooding.

The flooding in Derna was particularly devastating, with more than 30% of the city inundated by floodwaters and many buildings destroyed. This equated to approximately 15 square kilometres of land affected. Several thousand casualties were the consequence.

While it is not possible to attribute the event to climate change directly, it has played an important role in this flooding event. Rising global temperatures have led to more extreme weather patterns, increasing the frequency and intensity of heavy rainfall in many areas, including Derna.

Exercises

- Look at the satellite image from 2023-09-12 and compare it with the image acquired five days before on 2023-09-07, before the flood. Which changes can you detect?
- Due to the false-colour infrared visualization, the vegetation appears in red colour. Why do you think this makes sense here?
- Look at the town at the coast and try to identify the changes in detail (coastline, vegetation, roads near the coast, water).
- Compare your findings with the flood damage assessment map from the Copernicus Emergency Management Service provided below.

Additional Material



*Damage assessment map from the Copernicus Emergency Management Service
(red: objects destroyed by the flood, orange and yellow: damaged, blue: flooded)*

Links and Sources

- <https://www.globalfloods.eu/news/146-Libya%20Floods,%20September%202023/> - the Copernicus Emergency Service description of the flooding.