

2022-11-24, Sentinel-2

Venice, the famous "Floating City" of Italy, has been built on hundreds of islands in a lagoon near the Adriatic Sea. Due to this exposed situation the town has long struggled with flooding both from the sea and from the mainland.

To reduce the risk of flooding from the sea, the Italian government decided to install MOSE (Modulo Sperimentale Elettromeccanico, *Experimental Electromechanical Module*), an innovative flood protection system.

MOSE consists of three hydraulically operated barriers installed at the entrances to the Venetian Lagoon. Two of these entrances are visible in the overview satellite image to the left. When water levels rise, sensors activate the system, filling the barriers with compressed air and forming a solid barrier against high tides and storm surges.

MOSE integrates advanced technology for monitoring and control while considering the ecological balance of the lagoon. As a pioneering example of adapting to climate change, MOSE demonstrates how coastal cities can adapt to the risks of rising sea levels, and, as well, how big the effort of adapting is.

So far, MOSE has been successfully activated several times. One example of the system in its activated state is shown in the satellite map from 2022.



2021-11-04, Sentinel-2 (detail, MOSE barriers open)



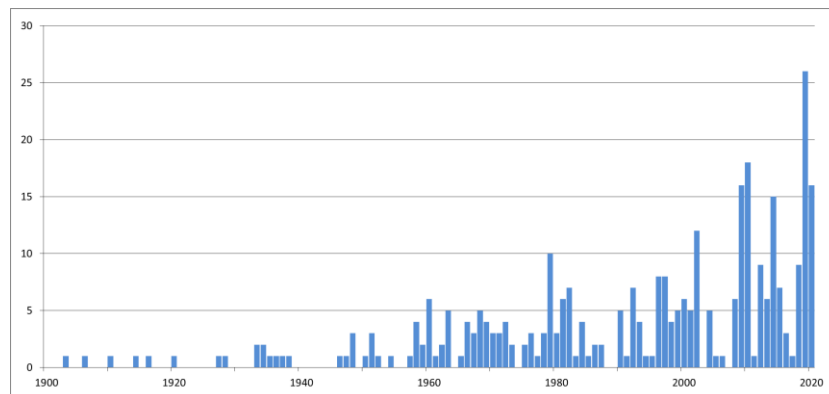
2022-11-24, Sentinel-2 (detail, MOSE barriers closed)



Exercises

- Explain the purpose of the MOSE project and how it addresses the city's vulnerability to flooding.
- Look at the satellite images and compare the state of Venice before the activation of the MOSE system with its condition after its activation. What visible changes can be observed?
- Analyze the role of satellite technology in assessing the environmental impact of the MOSE project. How can these images help evaluate the effects on the lagoon ecosystem and surrounding habitats?
- What does MOSE symbolize in terms of adapting to climate change?

Additional Material



Number of recorded "Acqua alta" events per year since 1900. Source: Città di Venezia, Alte Maree (<https://www.comune.venezia.it/it/content/grafici-e-statistiche#altmaree>).



View of the MOSE system in operation (photograph: Sandro Fusi)

Links and Sources

- <https://marine.copernicus.eu/news/record-venice-acqua-alta-copernicus-supports-flood-monitoring-and-storm-surge-forecasts> - detailed Copernicus report on an acqua alta event and the use of satellite data.

