

FLOODS AND FLOOD PROTECTION 41

Venice, Italy

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 increasing risk of flooding from the sea, the Italian government decided to install MOSE (Modulo Sperimentale Electromeccanico, 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. 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.



5. Development of the number of acqua alta events (high water levels) in Venice per year.



6. Venice. View of the closed MOSE barrier near Malamocco in the south of Lido.



7. Venice, Italy. Image acquired while the MOSE flood barriers were closed. Data: Sentinel-2, 2022-11-24.



8. Venice, Italy. True colour image of the central part of the lagoon with the MOSE flood barriers open. Differences in the ocean colour from sediments show sea currents. Data: Sentinel-2, 2021-11-04.