

# Venice tide barriers pass another test but skeptics remain

December 8 2019, by Colleen Barry



A yellow barrier, part of a plan to protect the city of Venice from flooding, floats on a barge, in Venice, Italy, Friday, Nov. 29, 2019. Central to the plan to protect Venice, some, or all, of the 78 barriers will one day be raised when the sea rises more than 110 centimeters to prevent damaging high tides from pushing into the lagoon city, a UNESCO heritage site built picturesquely but somewhat precariously among more than 120 islands. (AP Photo/Antonio Calanni)

Floated along by barge , one of the 10-ton barriers designed to relieve

Venice's perennial flooding looks like a giant plaything: an oversized hinged yellow Lego.

Central to the plan to protect the city, some or all of the 78 barriers will one day be raised when the sea rises more than 110 centimeters (43 inches), to prevent damaging [high tides](#) from pushing into the lagoon city, a world heritage site built picturesquely—but somewhat precariously—upon more than 120 islands. Concerns that high tides are becoming more frequent because of [climate change](#) have increased the urgency.

While the concept is simple, its realization has been anything but.

The system of movable underwater barriers, dubbed Moses, has been beset by corruption, cost overruns and delays. Projected at 1.8 billion euros (\$2 billion) and meant to be completed by 2011, the project has so far cost 5.5 billion euros and is running a decade behind schedule.

In the wake of last month's flooding of Venice, the worst in 53 years, the consortium that oversees construction of Moses is eager to demonstrate that the project—after years of bad news—is on track and will be fully operational by the end of 2021.

Venetians say they cannot afford to be wrong. Skeptics and critics say they may be.



A worker stands on the construction site of the project in Venice, Italy, Friday, Nov. 29, 2019. The system of moveable under water barriers, dubbed Moses, has been beset by corruption, cost overruns and delays. Projected at 1.8 billion euros and to be completed by 2011, the project has cost 5.5 billion euros and won't be operational before the end of 2021. (AP Photo/Antonio Calanni)

A recent test of the deepest expanse of barriers—at the Malamocco entrance to the lagoon—was declared a success by the New Venice Consortium.

It was the last of the four sections of barriers to be completely raised—but so far only in calm seas. The real test will come when all four are raised at once, and not only in serene waters, but under flood conditions. That isn't scheduled to take place until the end of next year.

It took six years to test each of the four movable sea walls covering the three openings to the lagoon, partly because work was slowed by a 2014 corruption scandal that implicated the three main contractors and sent 35 people to jail.

Work is continuing largely with the original subcontractors now contracting directly with the consortium, which itself has been placed under government control as a result of the scandal.



A yellow barrier, part of a plan to protect the city of Venice from flooding, floats on a barge, in Venice, Italy, Friday, Nov. 29, 2019. In the wake of last month's flooding of Venice, the worst in 53 years, the consortium that oversees construction of the Moses is eager to demonstrate that the project, after years of bad news, is on track and will be fully operational by the end of 2021. (AP Photo/Antonio Calanni)

The fact that the barriers have not yet been physically tested in rough seas is a concern to critics.

Paolo Vielmo, an offshore marine engineer who has long criticized the project, said that tests carried out in a laboratory in the Netherlands in the 1990s indicated that the barriers, under certain conditions, would oscillate out of control—possibly even breaking apart.

"Its behavior is not predictable," Vielmo said. He said that the trials so far declared successful have been under only modest sea conditions that fail to represent anywhere near the threat of the phenomenon of extreme oscillation called subharmonic resonance.

Vielmo and two other offshore engineers have compiled a report for the Codacons consumer and environment protection advocacy group, which is asking officials to run additional calculations to see if the project is indeed viable.





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And if it is not, Codacons says Moses should be stopped.

"We don't want to delay by one minute the possibility to make Moses operational. But we say we cannot make it operational until we are sure it will work," said Franco Conte, president of Codacons in Venice.

"Naturally, the Venetian community is exasperated and they say, 'If we did 95%, let's do 100% and see if that works.' But that is unconscionable. If we don't know if it works, we cannot experiment."

The [barrier](#) system is made up of giant flood gates, each 20 meters (66 feet) long. The gates are attached by hinges to giant cement blocks placed on the seabed along the three openings from the sea into the lagoon, Malamocco, Chioggia and the Lido. The gates can be lifted to create a temporary barrier in high tides. Once the water has receded, they can be lowered again—allowing shipping traffic to continue and for the tidal system to flush out the lagoon.



A worker walks in an undersea tunnel part of a plan to protect the city of Venice from flooding, in Venice, Italy, Friday, Nov. 29, 2019. The barrier system is made up of 78 giant flood gates, each 20 meters long which are attached by hinges to giant cement blocks placed on the seabed along the three openings from the sea into the lagoon, Malamocco, Chioggia and the Lido. (AP Photo/Antonio Calanni)

The idea behind the project was to create a mobile system that would not impede views of the unique and protected landscape. But Moses has suffered criticism from the start that there were simpler, cheaper systems that could have been deployed.

Venetians have been waiting since the record 1.94-meter (6.36-foot) flood of 1966 for a system to protect them from regular inundations. The flooding in November, the second-worst recorded, proved the

urgency.

In the 150 years that they have been recording the tide levels in Venice, two high tides above 1.5 meters have never been recorded in a year. In November, there were three in one week.

Climate scientists note that exceptional tides—those over 1.4 meters—have become much more frequent in the past two decades, with more than half of all recorded occurring since 2000.



A worker stands on the construction site of the project in Venice, Italy, Friday, Nov. 29, 2019. The system of moveable under water barriers, dubbed Moses, has been beset by corruption, cost overruns and delays. Projected at 1.8 billion euros and to be completed by 2011, the project has cost 5.5 billion euros and won't be operational before the end of 2021. (AP Photo/Antonio Calanni) A worker in Venice, Italy, Friday, Nov. 29, 2019. (AP Photo/Antonio Calanni)





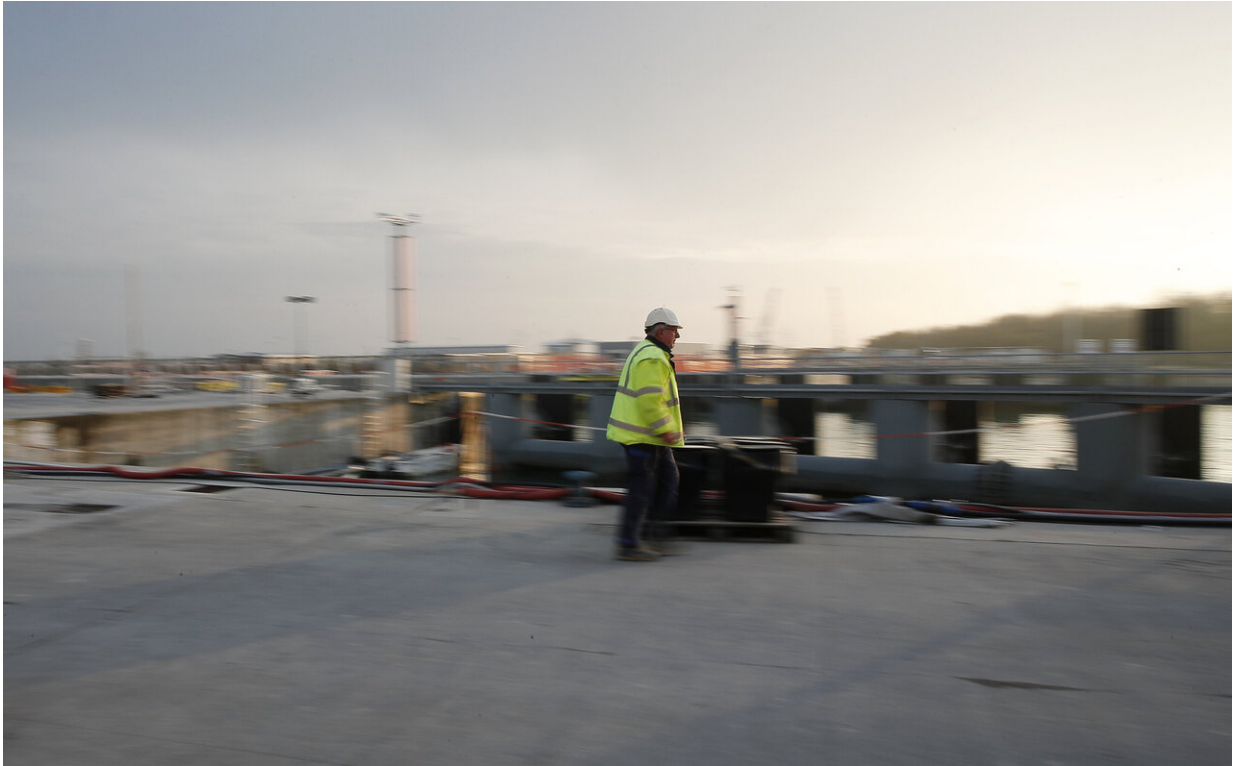
Chief engineer Alessandro Soru speaks to the Associated Press in an undersea tunnel, part of a barrier project to protect Venice from high tides, in Venice, Italy, Friday, Nov. 29, 2019. The barrier system is made up of 78 giant flood gates, each 20 meters long which are attached by hinges to giant cement blocks placed on the seabed along the three openings from the sea into the lagoon, Malamocco, Chioggia and the Lido. (AP Photo/Antonio Calanni)



A boat sails past a construction of the Moses project in Venice, Italy, Friday, Nov. 29, 2019. In the wake of last month's flooding of Venice, the worst in 53 years, the consortium that oversees construction of the Moses, a system of moveable under water barriers, is eager to demonstrate that the project—after years of bad news—is on track and will be fully operational by the end of 2021. (AP Photo/Antonio Calanni)



A worker walks in an undersea tunnel part of a plan to protect the city of Venice from flooding, in Venice, Italy, Friday, Nov. 29, 2019. The barrier system is made up of 78 giant flood gates, each 20 meters long which are attached by hinges to giant cement blocks placed on the seabed along the three openings from the sea into the lagoon, Malamocco, Chioggia and the Lido. (AP Photo/Antonio Calanni)



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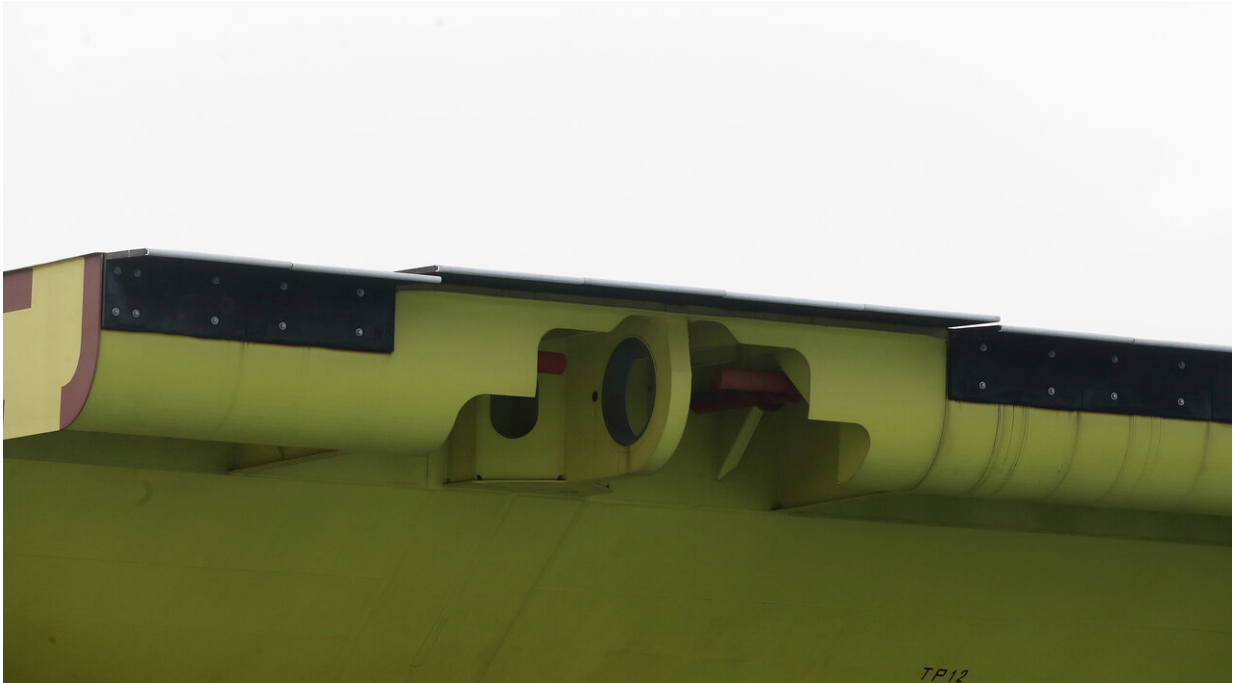




Workers stand at the construction site of the project in Venice, Italy, Friday, Nov. 29, 2019. The system of moveable under water barriers, dubbed Moses, has been beset by corruption, cost overruns and delays. Projected at 1.8 billion euros and to be completed by 2011, the project has cost 5.5 billion euros and won't be operational before the end of 2021. (AP Photo/Antonio Calanni)



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A detail of a hinge of a barrier, part of a plan to protect the city of Venice from flooding, floats on a barge, in Venice, Italy, Friday, Nov. 29, 2019. The barrier system is made up of 78 giant flood gates, each 20 meters long and the gates are attached by hinges to giant cement blocks placed on the seabed along the three openings from the sea into the lagoon, Malamocco, Chioggia and the Lido. (AP Photo/Antonio Calanni)

"One has to realize the kind of existential question that that serious flooding has given rise to," said Jane Da Mosto, an environmental scientist and executive director of the non-profit group We Are Here Venice, which is working to defend the city against myriad issues, including depopulation, cruise traffic through St. Mark's basin and overtourism. "People are asking: will Venice be defensible against these kinds of episodes?"

It's not just the still-uncalculated damage to landmarks like St. Mark's

Basilica, where corrosive salt water creeps through porous brick and tile. It's also the boxes of ruined belongings and piles of soaked mattresses discarded in alleyways and loaded onto motorboats and trash barges for disposal. The relentlessness of the Venetian fall and winter tides make one-third of ground floors uninhabitable in the historic canal city.

"I am very old, I cannot say that I want to die, but I certainly do not want to be witness to the fact that it does not work," 84-year-old resident Paola Scarpa said of the Moses barriers, as she walked to check on a family property in the Canareggio neighborhood on a recent December morning. "It would be a pain too great."

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