

# Sunken Treasures

When Venice, Italy suffered its largest flood in a half-century in late 2019, more than 80 percent of the city was submerged, as deep as 6 feet (1.8 meters). The corrosive saltwater caused US\$5.5 million in damage to St. Mark's Basilica alone. The very real possibility of future flooding threatened the treasure trove of art, architectural institutions and other cultural monuments that draw roughly 13 million tourists to the area each year. Experts have warned that the city may be uninhabitable by 2100.

"Venice has two problems: This is a city that is sinking, while the water level is also rising," says Adam Lowe, founder of the Factum Foundation, a not-for-profit focused on documenting and disseminating global cultural sites and objects, based in Madrid, Spain.

To preserve the fragile cultural metropolis, while reimagining what it means to visit Venice, the Recording and Analysis of Cultural Heritage in Venice (ARCHiVe) center launched a project in



High tide at St. Mark's Basilica in Venice, Italy. Below, a view of the Mose project

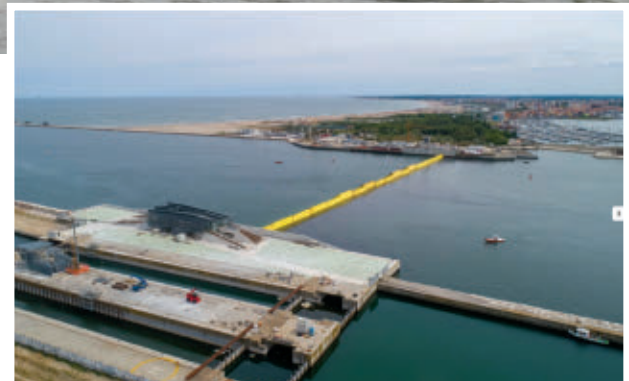
## High Time

Rising sea levels and a sinking city are a brutal combination. To combat the very real threat of future flooding, the Venetian government began construction on the Mose Project in 2003, though it's been bogged down in controversy and cost overrun. At US\$6.6 billion, the project budget is now three times initial estimates, and a 2014 bribery scandal even led to the arrest of the city's mayor at the time, though he was acquitted.

The hydraulic barrier system is made up of mobile

sea gates that rest on the bottom of the lagoon (the city of Venice comprises more than 100 islands inside a lagoon). In the event of winter storms or rising sea levels, the mobile sea gates rise, barricading three inlets to the lagoon and holding back the water. The project was accelerated following the 2019 floods and is finally slated to be complete this year.

A major milestone that hints the finish line may indeed be crossed: In October,



the Mose sea gates successfully rose for the first time. Even with the tide as high as 4 feet (1.2 meters), "there wasn't even a puddle in St. Mark's Square," Alvise Papa, director of

the Venice department that monitors high tides, told *The New York Times*. He estimates that without the project, about half the city's streets would have been under water that day.

early 2020 to digitally record the entire Venetian island of San Giorgio Maggiore. Factum Foundation, data firm Ecole Polytechnique Fédérale de Lausanne (EPFL) and the Fondazione Giorgio Cini signed on as project partners, while Iconem also participated. The process relies on a combination of two technologies: LiDAR scanning (which deploys lasers to capture spatial relationships across a large area) and photogrammetry (which

records high-resolution images and data to generate accurate 3D models).

Initially, the teams planned a 12-day trip for mid-2020, to converge in Venice and complete the intensive scans. When the pandemic hit, the team pushed forward, realizing that the lack of tourist crowds would give them a rare opportunity “to effectively use this pause to do something that might get put off or delayed under normal conditions,” Lowe says.

During the first phase of execution, in July, the team

used digital technologies to record the island from more than 600 spots, generating 60,000 million-point clouds (essentially a conglomerate of data from the recording spots). The team has plans to return to scan a few remaining gardens, before merging data from the two systems to create a fully realized 3D model. The Factum Foundation’s ultimate goal is to create ways to stream the data so that anyone would be able to view the 3D rendering of the city without any special software.

The lessons learned will be put to good use when the team returns next—and could inform future project plans, Lowe says. “If we can get the political support within Venice, there’s an extraordinary opportunity to do a citywide high-resolution recording initiative over the next two to three years,” he says. “We really hope that’s what will follow from this demonstration.”



**“Venice has two problems: This is a city that is sinking, while the water level is also rising.”**

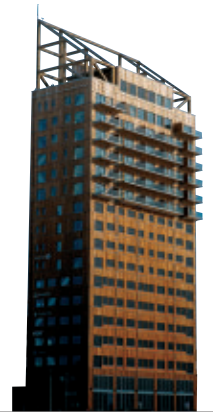
—Adam Lowe, Factum Foundation, Madrid, Spain

## Branching Out

Wood-frame skyscrapers have inched ever higher over the past decade, with the 18-story Mjøstårnet in Brumunddal, Norway (pictured at right) making PMI’s Most Influential Projects list thanks to its record height among timber structures. Now a new paper in the journal *Environmental Research Letters* is giving project leaders another reason to consider timber over concrete and steel.

The study found that if the construction industry embraced timber on a wide scale over the next two decades, some 420 million tons of carbon dioxide could be sequestered within wooden buildings in Europe alone. Timber naturally absorbs and sequesters carbon dioxide. On the other hand, the production of cement and steel are responsible for roughly 15 percent of carbon dioxide emissions worldwide, according to CleanTechnica.

The promise of “plyscrapers” appears to be catching on. Last year, France mandated that all public buildings after 2022 be constructed of at least 50 percent wood or other organic material.

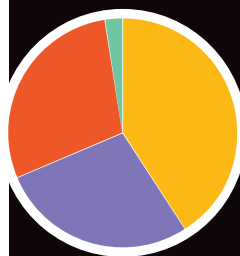


## Value of Wellness

Even for those who never caught the coronavirus, the global pandemic has taken a toll. That toll has shined a light on the ballooning size of the mental health market—and possible portfolio opportunities for organizations in that space.

**US\$120.8 billion** Size of the global mental wellness market in 2019

Researchers break the market into four parts:



**US\$49.5 billion** sleep, senses and spaces

**US\$33.6 billion** self-improvement

**US\$34.8 billion** brain-boosting nutraceuticals and botanicals

**US\$2.9 billion** meditation and mindfulness

Source: Global Wellness Institute, 2020