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Dispatches from the Field: Immersed in the Venice Lagoon

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Water is probably the first thing that springs to mind when you hear *Venice*. But the water that underlies the story of EBM in this great aquatic city is not just the seawater that fills Venice's canals and supports the weight of the 20 million tourists who snap selfies with the city's famed gondolieri every year. Safeguarding Venice's future is indeed about managing the sea and the ever more frequent breaching of canals and flooding of plazas brought about by rising tides. But it is also about freshwater, and brackish water, too.

I'm here in Venice again this year to participate in the teaching of the [Erasmus Mundus Master Course on Maritime Spatial Planning](#). This year the students are diving deep into the issues of managing the Venice Lagoon – the cradle of this globally significant cultural heritage site, a place thoroughly unique in the world. At 550 km², the lagoon is the largest in the Mediterranean and is important not only for the city of Venice that sits squarely in its center, but also for the many small towns and communities that are scattered across the lagoon seascape, and for the productive fisheries of the Northern Adriatic.

Visions for the lagoon, and the planning and management to achieve such visions, go far back in history – so far that you'd be hard-pressed to find an older example of regional-scale EBM.

Maintaining not only Venice, but also the lagoon

Though the founding of Venice in 451 AD was opportunistic^[1], subsequent centuries showed the Venetians to be careful, forward-thinking planners. And they were convinced they could manage nature.

Once the small islets in the lagoon had been consolidated into settlements, with buildings built on platforms supported by wooden pilings driven into the mud, the Venetians began to erect giant seawalls to tame the waves and tides. This helped modulate the incoming seawater but did little to stabilize the lagoon environment the people used for fishing and navigation. Lagoons are dynamic places, and the Venetians needed to stem the siltation that threatened to make the lagoon a stagnant shallow breeding area for mosquitos.

Thus in 1507, massive experiments in large-scale ecosystem engineering began with the creation of what was perhaps the first EBM agency in the world – *Magistrato alle Acque*. The *Magistrato*'s first intervention was a failed attempt to stabilize the lagoon by diverting freshwater from mainland canals into it, and its second was a more ambitious plan to divert all of the rivers (the Brenta, Musone, Tergola, Marzenego, Piave and Dese) away from it. The second attempt had the intended effect of stemming siltation but set in motion long-term problems from sediment starvation that decreased aquatic habitats such as marsh and seagrass beds and their stabilizing influences.

Over the subsequent centuries Venice accumulated a sophisticated knowledge of ecosystem dynamics and clung to the notion that they could create the lagoon they wanted: a brackish lagoon sheltered from the sea but with open access to it^[2] that provided food security with the fish and shellfish that characterized their cuisine.

New pressures cloud the vision

Modern times have complicated the story. The high waters (*acqua alta*) that had periodically flooded the City began to be more frequent as sea levels rose, and the city began sinking into the mud. Venice also became flooded in another way – tourists descended on it in ever-larger droves with the motorboats (and more recently giant cruise ships) transporting them creating wakes that exacerbated erosion and added to the sinking.

Yet Venetians continued their age-old tradition of protecting what they and the world so valued. After a disastrous flood that sent water levels to record high levels, a law was passed in 1973 (*'special law' 171/1973*) that legislated landscape-scale interventions: it required management to protect Venice 'in the lagoon system' in which it is situated. This meant a massive restoration project to recover ailing seagrass beds and disappearing saltmarshes so they could stabilize shorelines and control flooding. To date over 1,600 hectares of salt marsh and 12 km of coastal dunes have been restored in the lagoon, and a massive amount of work has gone into environmental remediation (removing sediments polluted by industrial development, harvesting macroalgal overgrowth, and stabilizing canals). Most dramatically, Venice has almost completed its *MOSE project* – a system of mobile mechanical barriers that can be erected to keep out the sea when major flooding threatens the City.

Whether Venice can be saved from rising tides, cumulative environmental degradation, and the pressures of mass tourism, only time will tell. But this experiment in EBM has been going on for centuries, and the Venetians' struggle to articulate a vision and bring it to fruition informs the whole of our watery world.

[1] The Veneti people who inhabited the coastal areas in the first century AD fled repeatedly into the marshes to hide out in the lagoon's small islands while marauding invaders pillaged the mainland. With the arrival of Attila the Hun, however, they realized that permanent settlement was the only solution.

[2] Throughout the Middle Ages the Republic of Venice was one of the great maritime powers of the world and the heart of trade between the Middle East and Europe.