

ABSTRACT

Sea level rise and the built environment: Expected impacts and solutions

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In 1997 as the United States embarked in its First National Climate Assessment (1997-2000) as required by law, the main source of scientific knowledge related to climate change and sea level rise were the first and second assessment reports of the Intergovernmental Panel on Climate Change (IPCC), respectively completed in 1990/92 and 1995, complemented by a variety of datasets and other information being collected by the U.S. Global Change Research Program (USGCRP).

At the time, there was little knowledge about matters related to climate change and sea level rise outside the scientific community. While some members of Congress had begun to study the topic to propose measures to address potential consequences, the public was mostly uninformed about these looming hazards.

To further complicate matters, the first and second IPCC reports offered conflicting findings relative to sea level rise, with the second report stating that: *However, indications are that both global warming and sea-level rise by the year 2100 may be 25-30% less than the IPCC 1990 projections.* The first IPCC report in 1990 had projected that: *sea-level will rise by 0.3-0.5 m by 2050; up to about 1 m by 2100.* Despite the resulting uncertainty, the consensus of the scientific community worldwide was that: *Probably the most important aspects of climate change on the World Ocean and coastal zones will be the impact of sea-level rise on coastal residents and on marine ecosystems.*

Soon after the First National Climate assessment was completed and presented to the Congress and the nation, as required by law, we entered an *age of denial* where ideology and misinformation fueled by special interests politicized the entire topic of climate change in the United States. Very little progress was made at the national level toward understanding the potential impacts of sea level rise and, more importantly, what we could do about them. Communities along the coastal regions began to experience first-hand some of the expected effects of sea level rise in terms of increased flooding events, higher storm surge and wave impacts generated by tropical cyclones, increased salt water intrusion and contamination of aquifers.

Fast forward to 2016. Miami, as a proxy for the entire southeast Florida region, has been designated as *ground zero* for the impacts of sea level rise. New York City and New York State have launched an ambitious project to protect the coastal region against expected impacts of sea level rise, spurred by damage suffered from hurricane Sandy in 2012. King Tide floods in South Florida, and elsewhere, have become worldwide news events. Sea level rise in front and central as the focus of our collective attention.

The question is: what are we doing about sea level rise and the expected impacts? Save rare exceptions, very little is being done in terms of adapting our coastal infrastructure and environment to the consequences of climate change. The population increase, proliferation of construction cranes and unstoppable urban development along our coastal regions, are signs of a business-as-usual approach that appears oblivious to sea level rise.

It is clear something needs to change. Toward that goal, this presentation will explore and discuss what the expected impacts of sea level rise may look like and methods to identify and implement potential solutions, to adapt and reduce the potential for damage from such impacts.