Sea Level Rise Vulnerability Study for the City of Los Angeles: Summary & Major Findings

Over the next century, sea level rise in the Los Angeles (L.A.) region is expected to match global projections with an increase of 0.1 - 0.6 m (5 - 24 inches) from 2000 to 2050 and 0.4 - 1.7 m (17 - 66 inches) from 2000 to 2100. Tides, wave-driven runup and storm surge sometimes cause coastal flooding in Southern California, especially when big wave storms occur at or near peak high tides. Sea level rise will potentially exacerbate the impacts from these events.

The City of L.A. owns and maintains coastal infrastructure that includes two power plants, two wastewater treatment plants, and the Port of L.A., one of the busiest in the world. All of these are situated about ten feet above sea level. A major component of L.A.'s economy is dependent upon beach tourism. In 2012, the Los Angeles region attracted over 41 million tourists, who accounted for more than $16.5 billion in expenditures.

Image of flooding in San Pedro (5th St. and Pacific Ave.) during a severe winter storm in January 2010. (Photo credit: Robert Casillas)

USC Sea Grant engaged City managers and a team of science and outreach experts to develop a science-based and stakeholder-supported adaptation planning process to assess the City's vulnerabilities and begin to prepare for accelerated sea level rise and associated storm impacts. The expert team conducted an assessment of the potential physical, social and economic impacts of sea level rise on the City's resources and population, as well as impacts to coastal and shoreline assets.

The full study can be accessed at: www.usc.edu/org/seagrant/research/sea_level_rise_vulnerability.html

Major findings

- The City's wastewater management, storm water management, potable water systems and roads are highly vulnerable to sea level rise.
- The Port of L.A. and the City's energy infrastructure have relatively low vulnerability to sea level rise.
- City parks and open areas are moderately vulnerable to flooding, because they can be restored fairly quickly.
- Museums and other coastal structures have higher vulnerability because of structural damage that may result from flooding.
- Roads are vulnerable to flooding and erosion, which may impede emergency services.
- Some coastal building stock is highly vulnerable -- particularly in Venice, where historic buildings and much of the community are at or near sea level.
- Some coastal communities, especially Venice, and low-lying Wilmington and San Pedro are home to highly vulnerable populations who may be unable to adapt to impacts of sea level rise because of social or economic challenges, including lower per capita income, lower education levels, linguistic isolation, older housing stock and high percentage of renters.
- Direct financial losses from building stock (with a 10-year storm event) are expected to exceed $410 million with a 0.5 m rise in sea level, or as much as $714 million with a 1.4 m in sea level rise.

The City has demonstrated proactive leadership in developing the planning process and in identifying its potential vulnerabilities to sea level rise and severe storms. Engineering studies are already underway for some critical City assets; resilience is already built into City operations. The process developed provides the template for assessing vulnerabilities for the entire suite of climate impacts on Los Angeles.

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