

Economic Impact of Sea Level Rise to City of Los Angeles

Dan Wei

Price School of Public Policy
University of Southern California

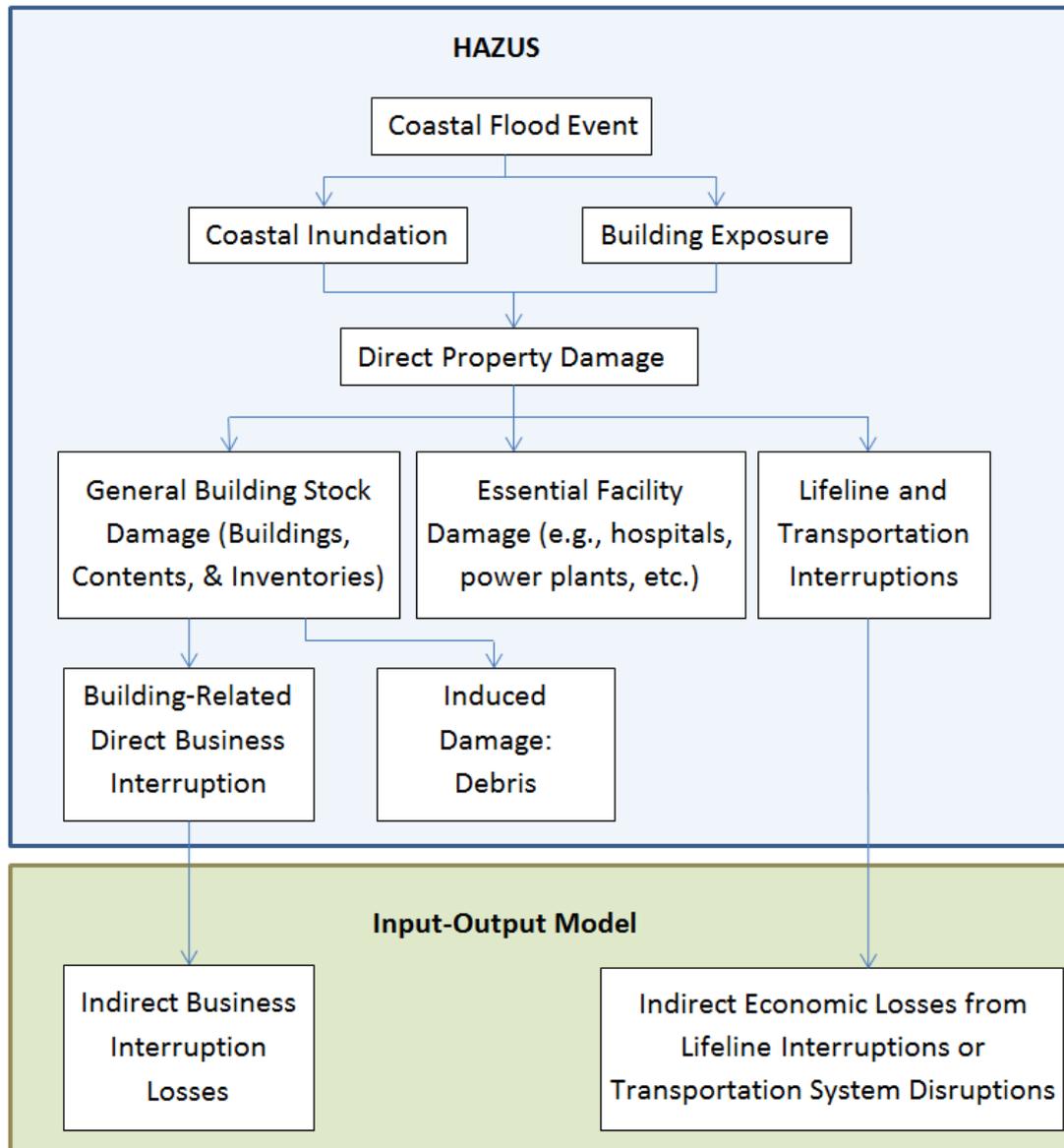
Objective of the Study

- Part of the larger effort to evaluate the vulnerability of City of Los Angeles to sea level rise.
- Analyze potential economic losses from coastal flooding events.
- Evaluate how sea level rise would increase the economic impacts from the simulated coastal flooding events.

Methodology

- Application of two modeling tools:
 - HAZUS MH 2.1: FEMA's standardized modeling tool for estimating potential losses from hazards
 - Input-Output (I-O) model: a static, linear model of all purchases and sales between sectors of an economy, based on the technological relationships of production

Methodology



Scenarios

- 10-yr coastal flood without SLR
- 100-yr coastal flood without SLR
- 10-yr coastal flood with 0.5 meter SLR
- 100-yr coastal flood with 0.5 meter SLR
- 10-yr coastal flood with 1.4 meter SLR
- 100-yr coastal flood with 1.4 meter SLR

Expected Building Damage by Occupancy and by Building Type

Occupancy/Building Type	0.5 m SLR		1.4 m SLR	
	10-Yr Flood	100-Yr Flood	10-Yr Flood	100-Yr Flood
by Occupancy Class				
Residential	1,001	1,858	1,644	3,361
Commercial	7	23	17	90
Industrial	6	9	11	26
Other	0	0	0	6
by Building Type				
Concrete	4	15	11	48
ManufHousing	5	5	6	8
Masonry	8	23	17	50
Steel	4	7	7	22
Wood	980	1,812	1,604	3,280

Summary Results of General Building Losses (millions of 2010\$)

Category	Base Case		0.5 m SLR		1.4 m SLR	
	10-Yr Flood	100-Yr Flood	10-Yr Flood	100-Yr Flood	10-Yr Flood	100-Yr Flood
Building Losses	103.3	260.9	179.4	364.4	315.0	649.9
Content Losses	132.6	312.1	219.6	435.5	380.2	759.9
Inventory Losses	6.8	15.5	11.3	20.3	19.7	31.5
Total Building Losses	242.7	588.6	410.3	820.2	714.9	1,441.3

Summary of Business Interruption Losses

Category	Base Case		0.5 m SLR		1.4 m SLR	
	10-Yr Flood	100-Yr Flood	10-Yr Flood	100-Yr Flood	10-Yr Flood	100-Yr Flood
Output Losses (M 2010\$)	\$3.4	\$7.4	\$5.8	\$10.5	\$9.1	\$21.9
Income Losses (M 2010\$)	\$2.3	\$4.9	\$3.8	\$6.6	\$5.9	\$13.6
Employment Losses (Jobs)	24	52	41	74	64	158

Conclusion

- For 0.5 m SLR, direct building losses are expected to be \$410M and \$820M for 10-yr and 100-yr flood events; losses increase to \$715M and \$1.4B for 1.4 m SLR.
- The majority of damaged buildings are residential buildings.
- Business interruption losses are relatively small compared with building stock losses; tripling of BI losses with 1.4 m SLR.
- Transportation system and utility system are expected to suffer very limited damages from the flooding in the scenarios evaluated.
- Results are on the conservative side; impacts caused by long-term and permanent coastal erosion and beach area losses of SLR are not covered in this study.