

ECONOMIC ANALYSIS OF SLR IN HAMPTON ROADS > STUDY DESIGN OPTIONS



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Motivation

2

- Understanding the regional economic impact of SLR to support policy decisions concerning:
 - Local revenue threats arising from SLR
 - Identification of potential issues during recovery from extreme flooding
 - Estimation of the adaptation level required in this region
 - Justification of expenditures on adaptation efforts

Four Proposed Studies

3

- Direct Estimation
- Property Value Analysis
- Economic Drag from SLR
- Economic Impact from Adaptation

Direct Estimation

4

- Utilize GIS with SLR scenarios to develop both areas impacted by recurrent flooding and in potential risk of extreme weather events
- Using both current and projected locations of employment, households, and property values, measure the economic shock this creates for the community
- Input this shock into the HRPDC regional economic model to measure the sustained impact to the economy

Direct Estimation

Case Study

5

- Lichter and Felsenstein (2012)- “Assessing the cost of sea-level rise and extreme flooding at the local level: A GIS Based Approach”
- Haifa and Tel Aviv were the cities of focus
- Focused on the GIS methodology, rather than using data created to make an economic analysis
- Added an economically vulnerable population component

Direct Estimation

Pros/Cons

6

□ Pros

- Straightforward Analysis
- A significant portion of the data is already available through GIS and LIDAR resources now in hand

□ Cons

- Likely to understate the total costs because it leaves out dynamic effects

Property Value Analysis

7

- Hedonic Price analysis uses a regression analysis to determine the impact of various characteristics on the price of real estate
- Would focus the analysis on teasing out the impacts of flood insurance and flooding on home values
- Control for other factors that might change the price of a home
- Requires extensive parcel and sales data to develop the necessary controls

Property Value Analysis

Case Study

8

- Bin & Polasky (2004), Bin et al (2008)
- These studies on eastern North Carolina counties have become the go to example for this analysis
- Found that there was a price impact from being in a Flood zone (-3.8%), but that the price impact increased significantly after a major weather event (-8.4%)
- This was before the most recent changes to flood insurance premiums

Property Value Analysis

Pros/Cons

9

□ Pros

- Inform about the current impact of flood risk on property values, along with risks to residential assessments in the aftermath of a Hurricane
 - This allows for an estimation of the impact on local budgets

□ Cons

- Would need accurate parcel and sales data
- Correct specification for the regression analysis will be difficult

Economic Drag from SLR

10

- This method would move beyond the Direct Cost estimation, and would attempt to measure the drag on investment both as a result of risk from SLR and during the recovery from an extreme flooding event
- This would allow for a fuller accounting of the economic impact of sea level rise
- Efforts have been done on national and global scale, but few published efforts have attempted this analysis at a regional scale

Economic Impact of Adaptation

11

- Separate the concepts of mitigation and adaptation
- Many papers have set up how to model this impact, mostly relating to the direct cost of adaptation rather than indirect impacts
- Would require limiting adaptation to a set of techniques, and modeling different potential methods for paying for adaptation.

Comparing the Studies

12

- Direct estimation- follows existing methodologies, data readily available, and its results will be clear
- Property Value Analysis- follows existing methodologies, data is available, and results will be clear
- Economic Drag from SLR- requires adaptation of existing methodologies, new data will need to be procured, and more complex results
 - ▣ Will provide a more accurate representation of total costs
- Economic Impact of adaptation- existing methodologies, new data will need to be procured, and more complex results
 - ▣ Assist decision making about type and financing of adaptation