NY Stakeholders’ Interaction and Feedback on a Coastal Protective Strategy Optimization

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Abstract

As the sea level rises, it is alarming that the threat from flooding induced by tropical cyclones would cause more severe damages to coastal regions worldwide. In order to address this threat, optimizing coastal protective or mitigation strategies is necessary, given limited resources. The optimization methodology must incorporate feedback from stakeholders for practical use. Multiple interviews were conducted by engineering model developers and social scientists with stakeholders who have first-hand knowledge and varied backgrounds in New York. The protective strategies have been tuned to the critical infrastructure’s particular and contextual risks due to flood hazards by engaging and integrating stakeholders’ knowledge on the interdependency of the infrastructures and other aspects after the first interview. The second interview was conducted for further model improvement.
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Abstract
As the sea level rises, it is alarming that the threat from flooding induced by tropical cyclones would cause more severe damages to coastal regions worldwide. In order to address this threat, optimizing coastal protective or mitigation strategies is necessary, given limited resources. The optimization methodology must incorporate feedback from stakeholders for practical use.

Overview of results from 1st Set of Interviews
- Optimizations of coastal protections are necessary, given limited resources. The optimization methodology must incorporate feedback from stakeholders for practical use.
- Multiple interviews were conducted by engineering model developers and social scientists with stakeholders knowledgeable about different aspects of flooding and critical infrastructure in New York City. Data from the first set of interviews were used to elicit stakeholders’ knowledge on the risks posed by flood hazards to interdependent critical infrastructure.
- This knowledge was then synthesized and integrated into the engineering model and optimization. The section of second interviews was conducted for further model improvement.

Overview of results from 2nd Set of Interviews

Comments on Interdependent Infrastructure Diagram
- It covers a lot and makes sense (all interconnected) (mentioned by interviewees #1,2,4)
- Add more components (e.g., sewage, pumps, electric vehicles, hazardous lights) (#2,3,7,10)

Suggestions on Storm Surge Modeling
- GeoClaw
  - The animation of how storm unfolds looks real (#1)
  - The difficulty is to know how exactly wet it is (#1)
  - Currents are not much of concern (#1,3,7)

GISSR
- Fast model like this is very useful (#2,3,4,7)
- Add inland mitigations (#1,7)
- Add sewage components (#3)

Comments on Preliminary Optimization Methodology and Results
- The model is great; it will help in decision-making (#1,2,4)
- The construction cost should be updated (maybe refer to ESCR & BMCR projects) (#1,10)
- Try different scales (e.g., neighborhood level) (#10)
- Add more strategies (e.g., buy-out, sealing openings) (#3,4)
- Consider different time horizon (e.g., 24 or 48 hours) (#10,11)

Additional Comments
- Many funding resources require to protect vulnerable populations (e.g., the Housing Urban Development), and sometimes resilient efforts can be conflict (#4)
- It is difficult to convince the general public about future risk; they do not believe it (#4,10)
- Everyone has their own idea of what optimal is (#7)
- Integrated model that runs at any given time for decision making (#2)
- Cost change due to pandemic (#1)

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Stakeholders’ Interviews

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Stakeholders Interview Number and Sector:
- Stakeholder: #1, #2, #3, #4, #5, #6, #7, #8, #9, #10, #11

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