

Coastal Storm Damage Relationships

Becky Storm Damage Model

Jacksonville, Florida

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Objective: To Quantitatively
Describe Structure Damage
from Inundation, Wave,
and Erosion



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Information Sources

- Data on Storm Damage and on Existing Structures
- Models on Storm Damage and Storm and Architectural Parameters
- Expert Elicitation



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It's Important to Be Timely
With Coastal Storm Damage
Data Collection, but there has
been

No Major Coastal Flooding
on U.S. Mainland for the Last
Three Years.



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Expert Opinion:
Necessary in the Absence of
Significantly Useful Primary Data



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Expert Elicitation: Provides Consensus Building in the Face of Contention or Complexity



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Expert Elicitation: Heuristic, Non-Scientific Tool for Dealing with Unknowable or Inaccessible



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Damage Sources Considered in Elicitation

- **Waves**
- **Stillwater Flooding**
- **Erosion**
- **Wave Run-up**



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WAVES

- Question of: What is the Critical Height of Breaking Wave at Point of Contact with Structure?



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Stillwater Flooding

- How Does Damage Function *Differ from Inland Generic Functions?*



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Erosion

- Long-Term Rate and Event-Driven Erosion Both Have a Significant Role Impact on Lifecycle Analysis



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WAVE RUN-UP

- Waves Associated with Stillwater Level
- Can Still Be a Factor With Depth and Velocity



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CASES CONSIDERED

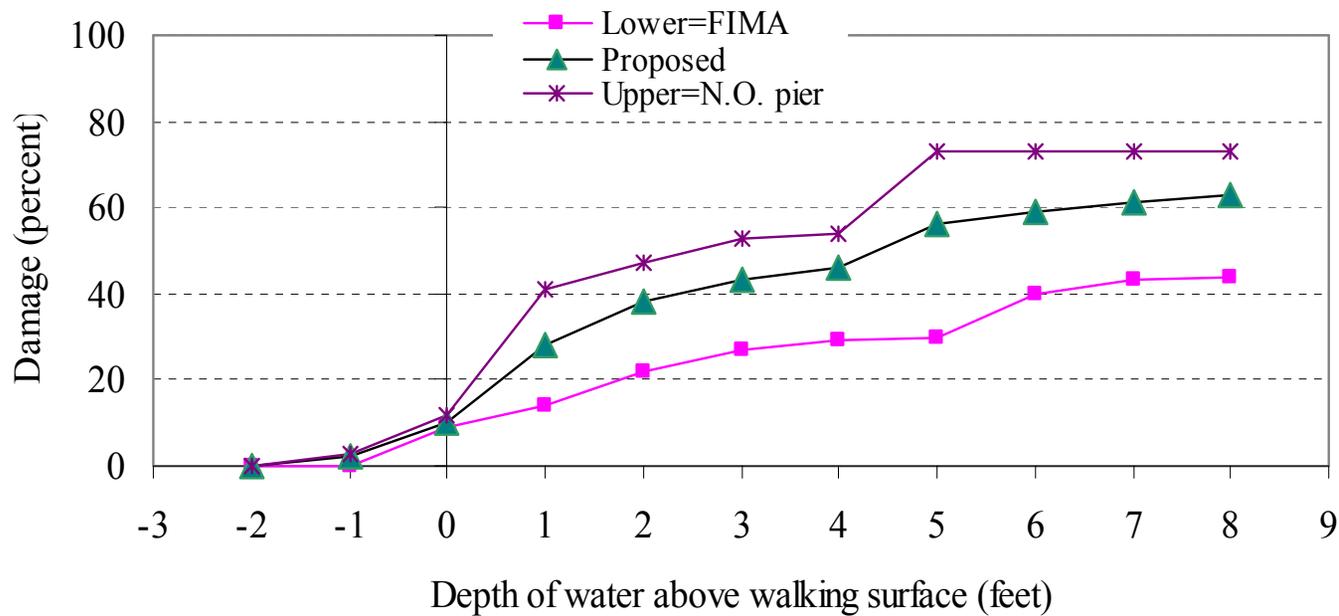
- Inundation
- Erosion
- Run-up
- Inundation & Waves
- Run-up & Waves
- Inundation & Run-up
- Inundation & Erosion



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Inundation Wood frame without piles (no enclosure)

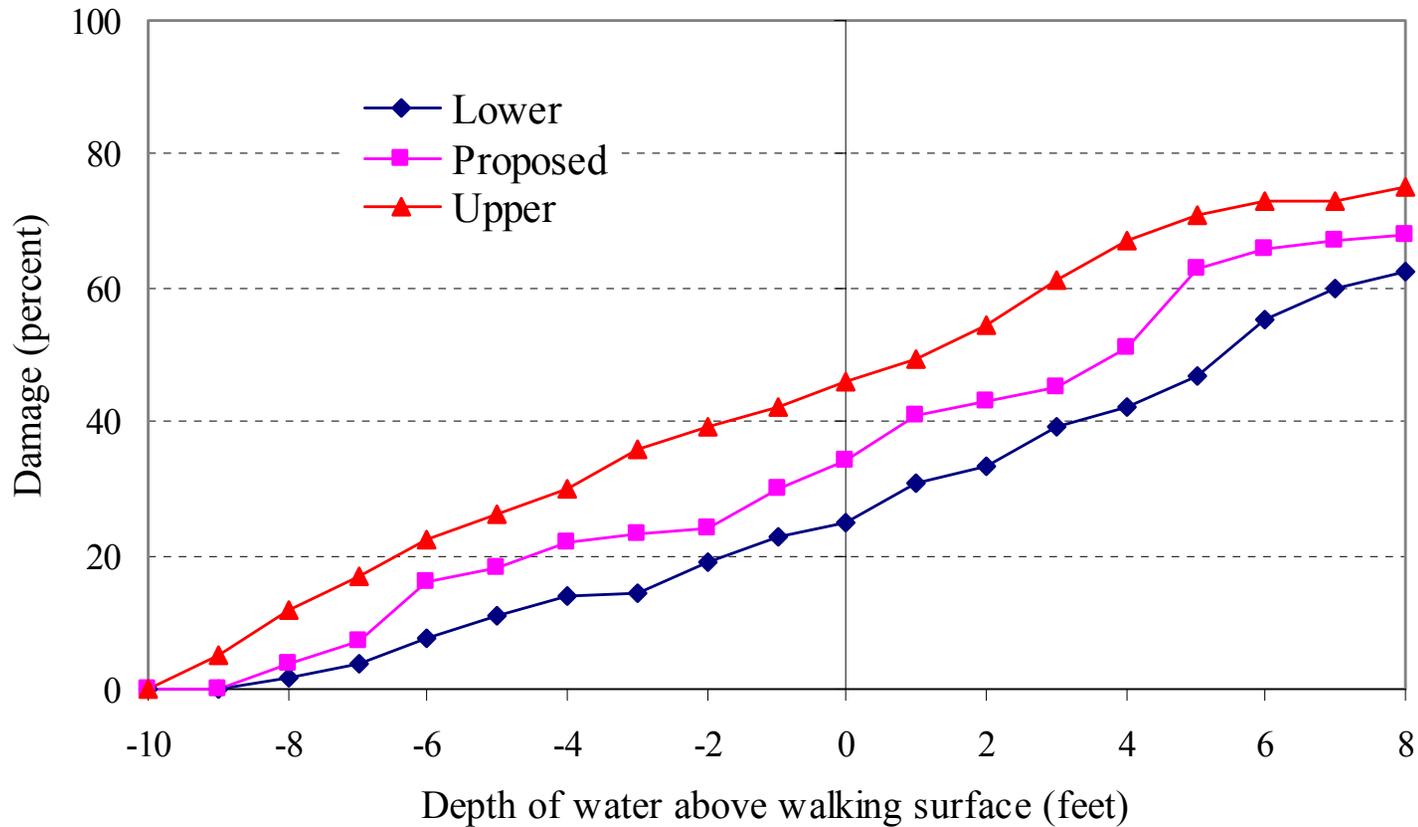


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Inundation

Wood frame with piles (full enclosures)

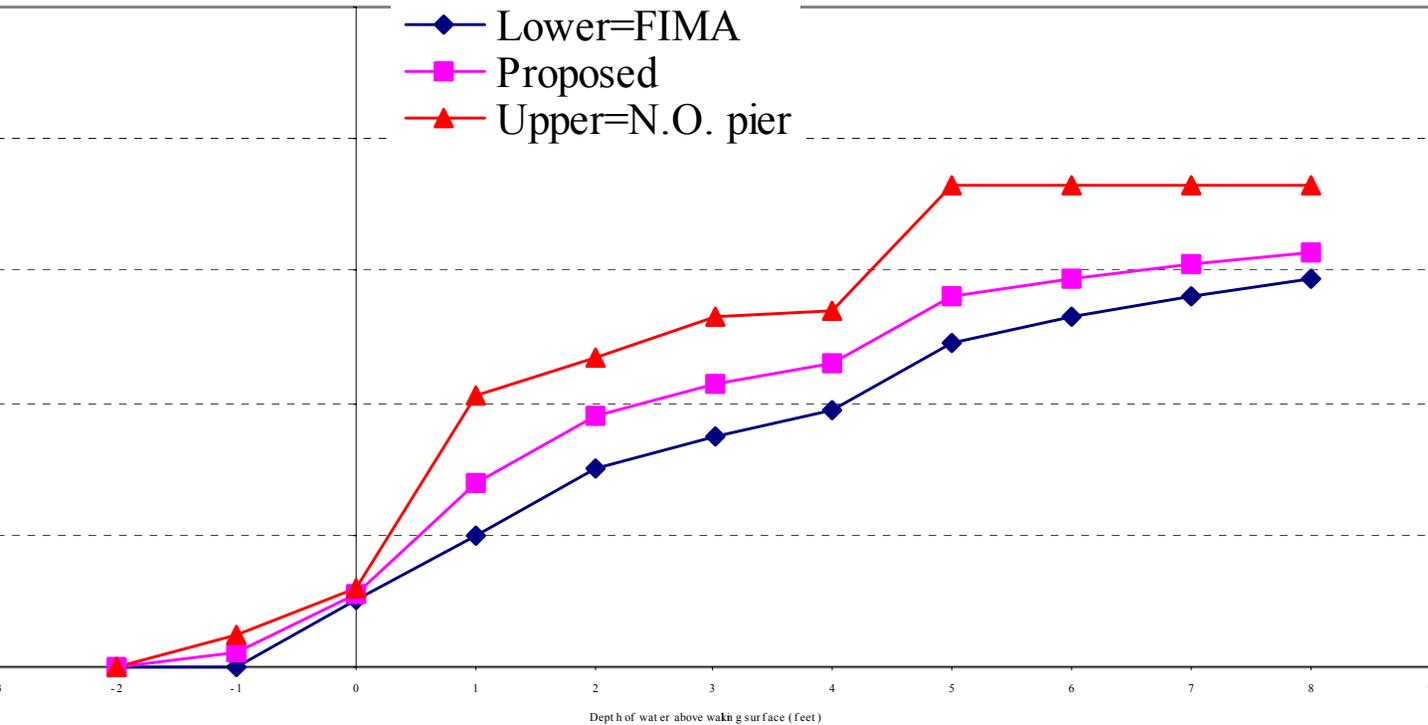


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Inundation

Wood frame with piles (no enclosures)

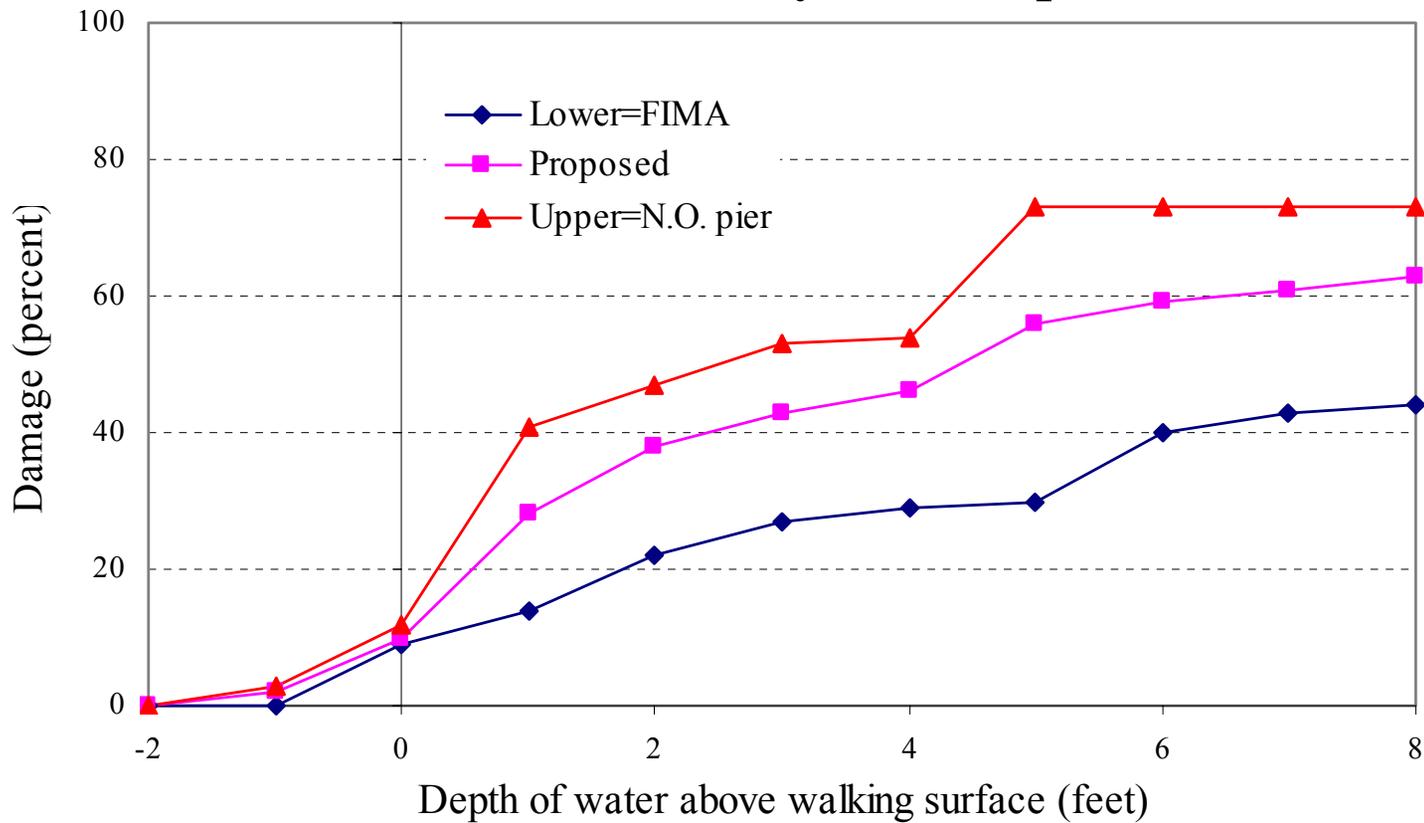


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Inundation

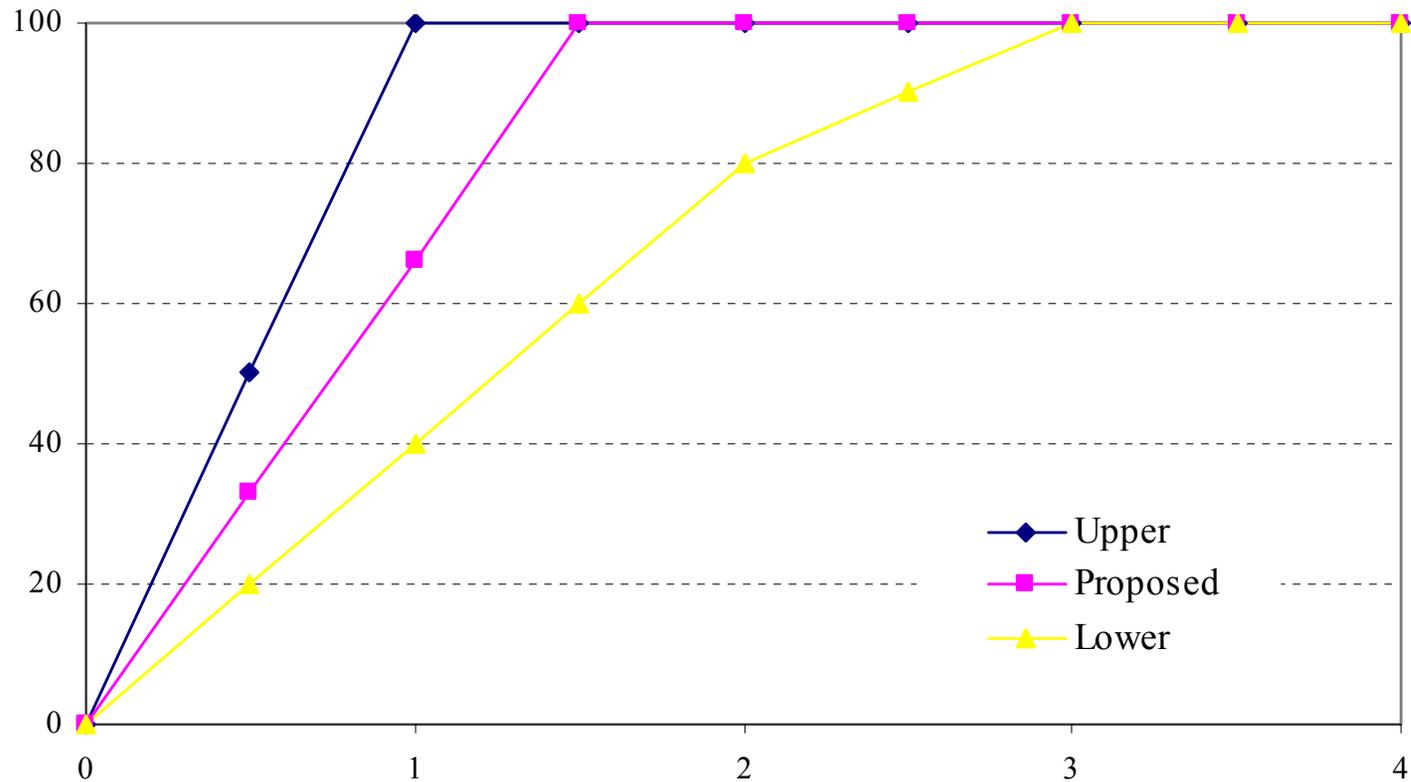
Concrete and masonry without piles



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Waves - Structure not on piles



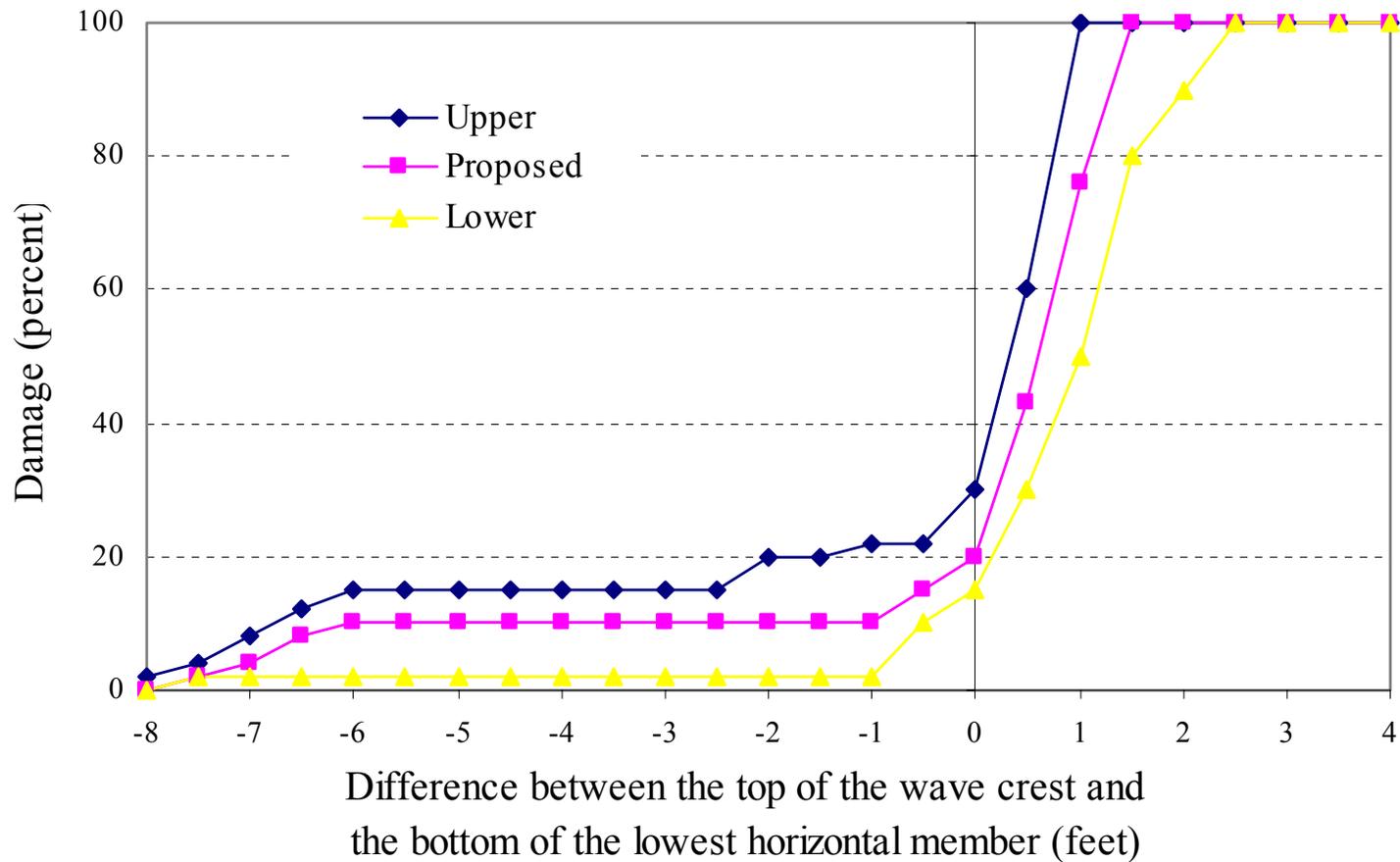
Difference between the top of the wave crest and the bottom of the lowest horizontal member (feet)



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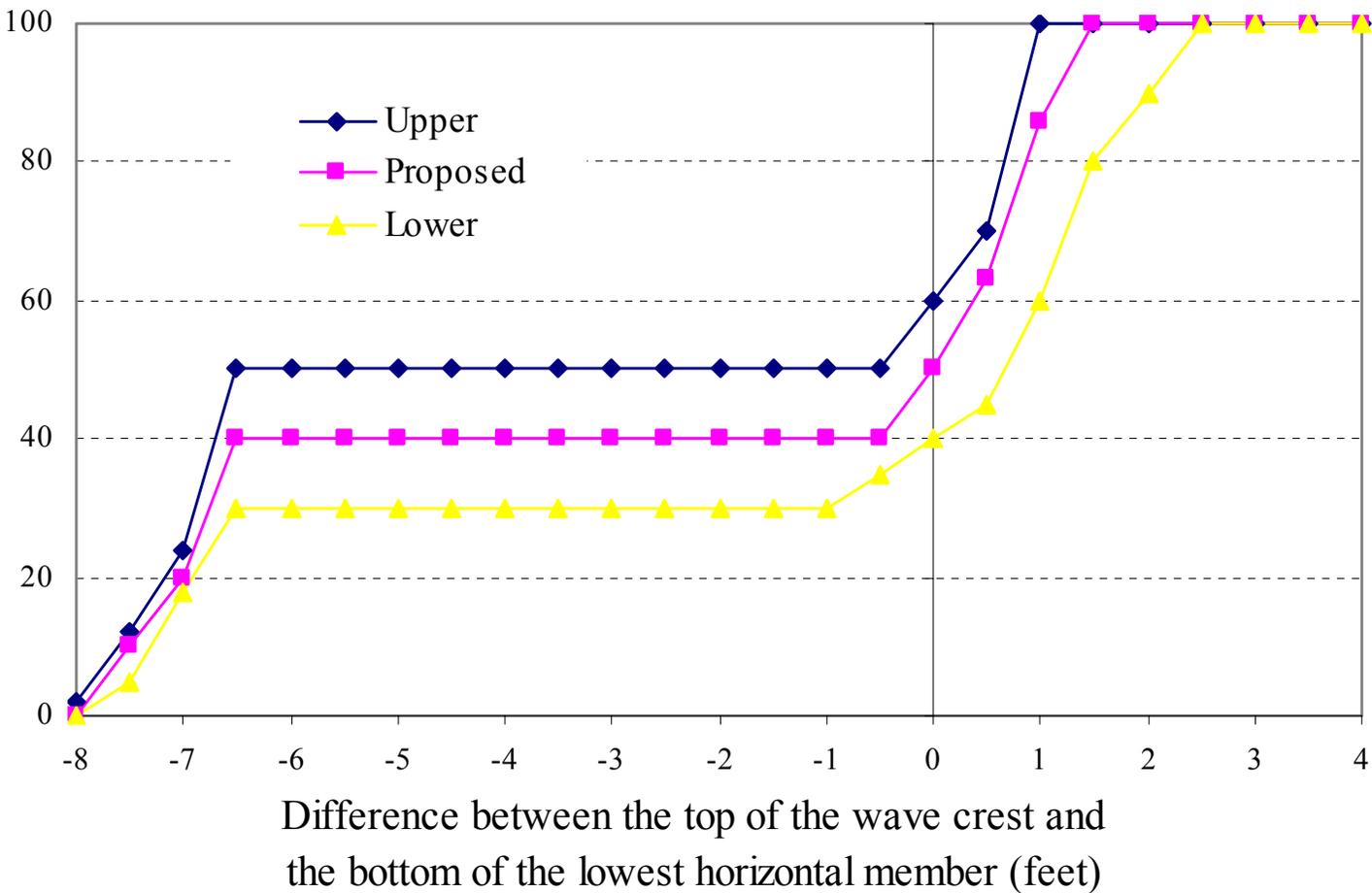
Waves - Structure on piles (no enclosures)



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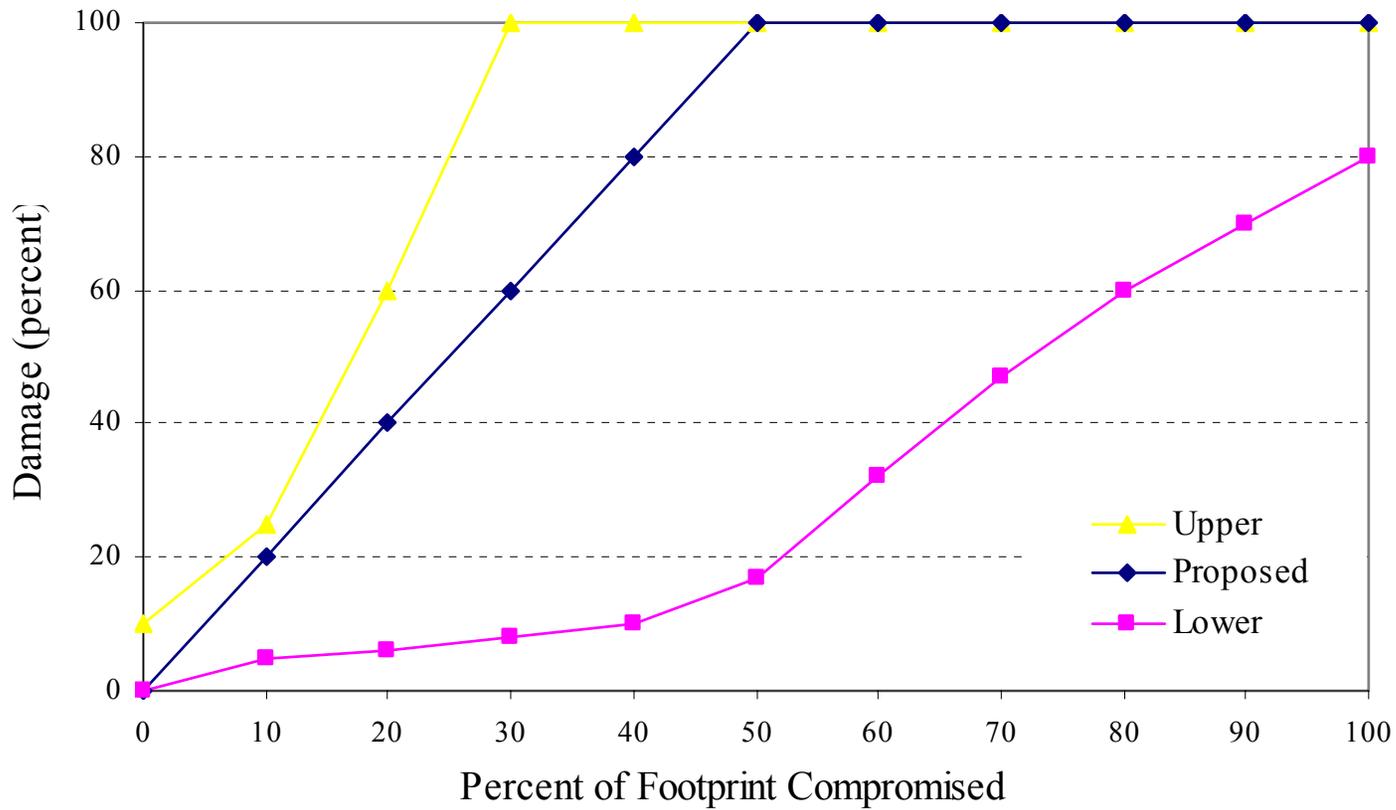
Waves - Structure on piles (full enclosures)



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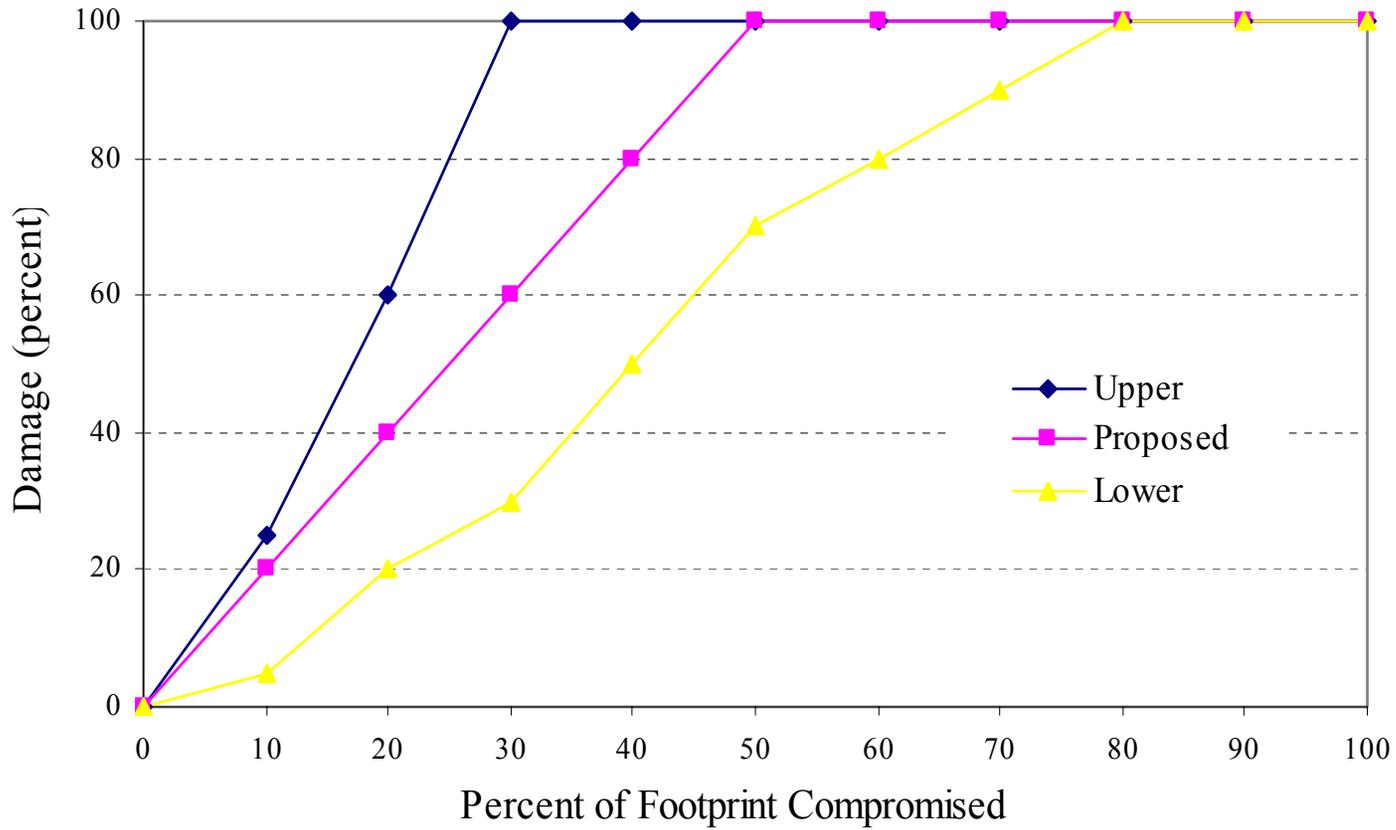
Erosion - Pile Foundation



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Erosion - Shallow Foundation



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Conclusions

- Further Verification is Needed for Expert Elicitation Results
- Program for Data Collection Needs to Be Established
- Allowances are Needed for Regional Differences



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