

Road Criticality Assessment for Communities Access to Critical Facilities in Delaware

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Introduction

Disaster

Center

Floods not only cause direct inundation of the streets and buildings but also isolate communities from critical facilities, such as hospitals. The disruption of healthcare facility access will negatively impact community well-being and further exacerbate the health inequity of socially vulnerable population. This research aims to:

- (i) Develop a metric to inform equitable risk mitigation
- (ii) Assess road criticality for access to critical facilities, and post-flooding access restoration (iii) Identify critical communities for targeted support.

100,887 nodes (or intersections); 117,491 edges (or roads);

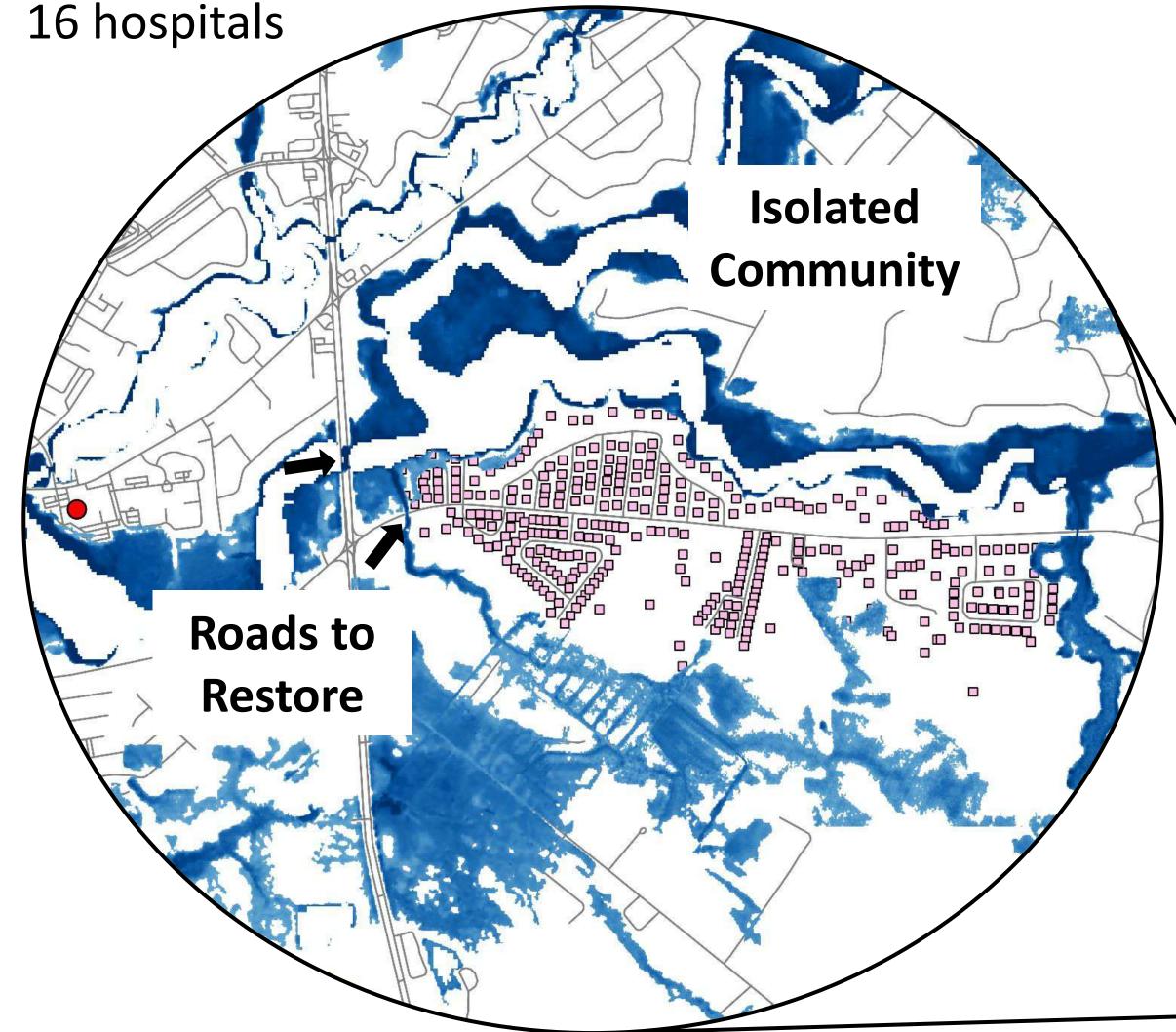
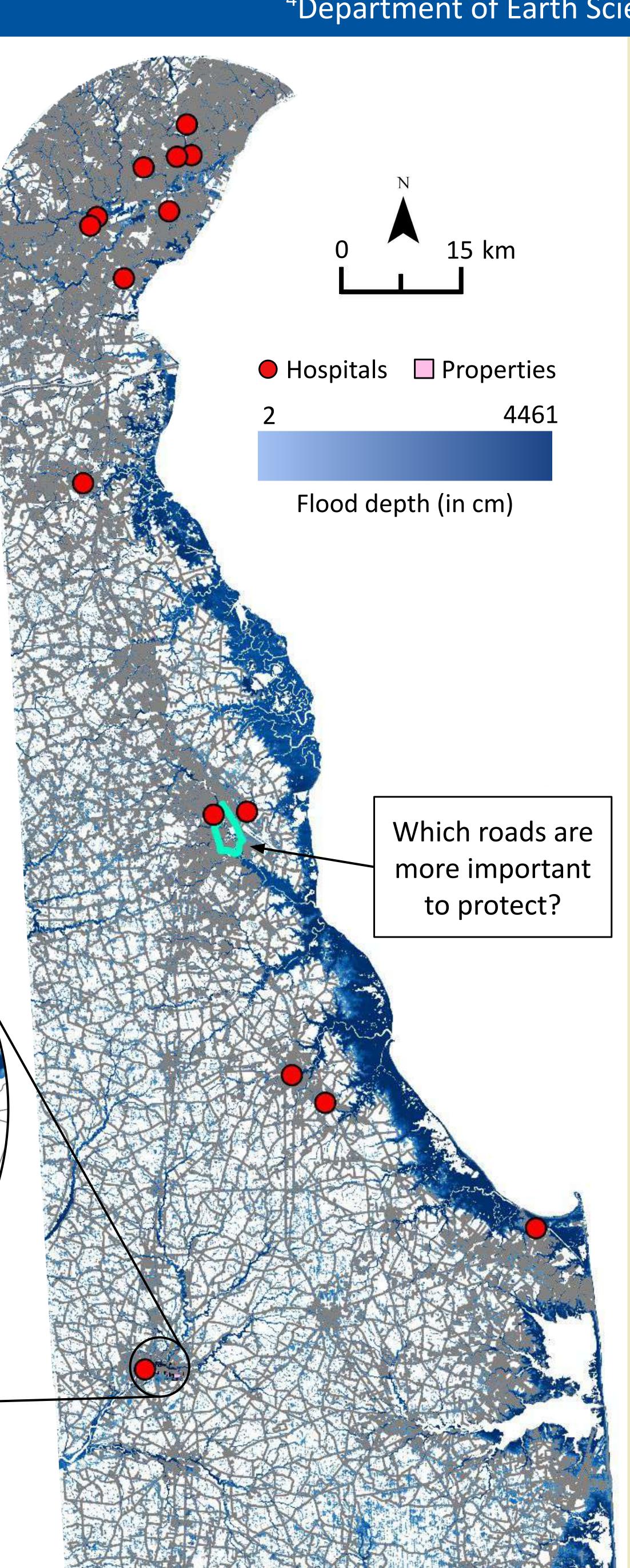


Figure 1. Critical roads connecting disconnected properties with hospitals for post-flooding access restoration.



Results Critical roads for Critical roads for Unique critical selected community the network roads Road criticality Road criticality 0.05 0.06 0.08 More critical More critical —— Flooded links for the network for community

Figure 2. Critical roads for comparison for access to hospitals in Dover, DE. The road criticality is calculated for access to hospitals before flood and after 100-year flood for a small community with social vulnerability index (SVI) 0.972.

Conclusion

12% of nodes are flooded which cuts off around 48% of the nodes' access. A total of 4% roads in the network are required to reconnect all the disconnected cluster of properties (around 50%) to hospitals. The results suggest importance of considering the consequences of isolation in flood risk assessment and accessibility improvement. The results also highlight that critical roads might vary on the state level and census tract level.

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