

Thesis Portfolio

Flood Monitoring and Mitigation Strategies for Flood-Prone Urban Areas
(Technical Report)

Flooding Mitigation Techniques in Other Flood-Prone Regions and an Analysis of Their Possible
Use to Charlottesville
(STS Research Paper)

An Undergraduate Thesis

Presented to the Faculty of the School of Engineering and Applied Science
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In Fulfillment of the Requirements for the Degree
Bachelor of Science, School of Engineering

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Thesis Prospectus

Sociotechnical Synthesis

As the threat of climate change continues to press on our society, threatening our way of life as well as our safety, it is of paramount importance that we work together and learn from one another in an effort to reverse its effects quickly and effectively. Therefore, when given the opportunity to work on a capstone project¹ that concerned flooding for the City of Charlottesville, I started to search for helpful STS questions that could be answered in conjunction with this technical project. Inspired by the City of Charlottesville's interest in mitigating the effects of flooding for its community, I looked to an STS topic that would further shed light on possible efforts that could be taken by the City.

The City of Charlottesville is in a unique and valuable position of having a University within its community. As we began work on our technical project, developing a flood-monitoring sensor system for the City of Charlottesville, questions started to come about regarding other efforts that could be taken to further reduce the effects of flooding on our community. This STS research topic allowed for a natural extension of that conversation. The technical report included here covers our efforts to develop a technically rigorous solution to monitoring flooding conditions in the City of Charlottesville. The STS research paper, in turn, covers the importance of mitigation, types of flooding-related infrastructure, as well as social, political and economic factors that are important to the mitigation of flooding.

¹ In the author's course of study at the University of Virginia, two "capstone" projects were completed to fulfill Computer Engineering graduation requirements as well as requirements for the Technology Leaders Program. One project was completed under Prof. Harry Powell and one under Prof. John Goodall. Upon the advice of the author's academic advisor, Prof. Joanne Dugan, and the author's STS advisor, Prof. Michael Gorman, the Technical Report for the most applicable project was included in this Thesis Portfolio.