

## **Thesis Portfolio**

Causal Impacts of Climate Change on Human Health Outcomes  
(Technical Report)

U.S. Climate Change Policy: An Analysis of the Primary Stakeholders  
(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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## **Table of Contents**

Sociotechnical Synthesis

Causal Impacts of Climate Change on Human Health Outcomes

U.S. Climate Change Policy: An Analysis of the Primary Stakeholders

Thesis Prospectus

## **Sociotechnical Synthesis**

Global climate change is arguably this generation's most pressing issue, and while some European countries have already taken drastic steps to reduce carbon emissions, the rest of the world and especially the United States, who ranks 40th out of 58 countries in the Climate Performance Index, is lagging. United States climate change policy has been a controversial topic for several years, and the rise of misinformation in the media and contrarian culture has deepened this divide. Climate change as revealed by the scientific community, however, has been established and shown to be caused by human actions for decades, and the general public is slowly also beginning to understand human influence. The importance of understanding the nuances of climate change extends beyond just curiosity purposes, as climate change has several health effects, both direct and indirect. It is no longer a question of whether or not climate change will impact our health, but the extent in which we are already doing so and whether or not we will enforce the proper adaptation and mitigation efforts.

The two projects in this portfolio include the technical capstone project and the STS research project. The technical project is a series of computational models that develop causal links between respiratory-related mortality and air particulate matter observations in the DC-Maryland-Virginia area. Many factors such as temperature, social vulnerability indices, and geographic locations are taken into account for the technical project. The STS project differs in that instead of looking at specific health-related air pollution effects, the policy of climate change in the United States and the primary influencers are evaluated. Through the use of historical case studies and policy analysis, complex interactions between the stakeholders of the scientific community, the general public, and policy makers are broken down. In the technical portion, several causal links were found between different air pollutants and mortalities, and

stratifications by age, race, and disease provided clarity on health-climate relationships. However, through policy analysis it was found that laws and political efforts have not been up to par in reflecting scientific findings such as these. Both of these projects reflect the disparities between what the scientific community suggests to combat climate change and what the political atmosphere in the United States is willing to do currently to mediate health impacts of climate change — which is frankly, not much at all.

Working on these two projects simultaneously has brought me a lot of new information on the importance of revising human actions so that the environment can still be sustainable for the human species. My very alarming scientific findings of the health impacts of climate change juxtaposed with some of the close-to-none efforts taken by governmental bodies has deepened by concern for future generations' ability to support a growing population. I am far more cognizant of every decision I make and how this may contribute to the unavoidable time bomb that is the downfall of our climate. At the same time, I am distrustful of the current US stakeholders to reverse climate change effects, and disheartened that my efforts to raise awareness and relay accurate information may be futile.