Thesis Project Portfolio

North Grounds Stream Restoration
(Technical Report)

Using Actor-Network Theory to Examine the Effects of Hurricane Katrina on the City of New Orleans
(STS Research Paper)

An Undergraduate Thesis

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Bachelor of Science, School of Engineering

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Table of Contents

Executive Sumary

Throughout our technical project, my team and I applied Actor-Network theory to construct a network comprising both human and non-human elements, aimed at devising a restoration plan for two tributaries of Meadow Creek. These waterways have suffered considerable erosion and incision due to heightened runoff resulting from development in the surrounding watershed. Exploring the significance of establishing resilient technological networks, my STS research investigates the network established by President George W. Bush in an unsuccessful endeavor to safeguard New Orleans from natural calamities, with a focus on the case of Hurricane Katrina.

In the context of our technical project, my team and I engineered a stream restoration system. Central to this system was the integration of a step-pool conveyance system, engineered to mitigate the erosive impacts on the stream banks by dissipating energy from upstream water flow. Despite the apparent simplicity of this solution, numerous intricate steps were involved in determining the most effective approach. Our process commenced with the collection of online GIS data for the project area, followed by water quality assessments and comprehensive surveys of the targeted tributaries. These preparatory measures enabled us to design a solution aimed at reducing erosion potentials effectively.

Utilizing the data gathered, we initially modeled the stream using HEC-HMS, facilitating simulations of watershed and channel behaviors to forecast flow volumes, stage, and timing. Subsequently, employing HEC-RAS, we crafted the design for our step pool conveyance system, identifying it as the optimal solution to the erosion challenge.

In my STS research, I employed the Actor-Network theory framework to analyze President George W. Bush's efforts to assemble both human and non-human actors in the task of

safeguarding the city of New Orleans. Human actors encompassed various organizations such as FEMA and the Army Corps of Engineers, alongside individuals like President Bush and Governor Ray Nagin. Non-human actors ranged from natural elements like storm surges to technical components like the levee and canal systems surrounding the city. Through my paper, I contend that President Bush's failure can be found in his inability to establish and sustain an effective actor-network capable of adequately protecting the city from the devastating impact of Hurricane Katrina.

Having worked on both projects simultaneously, I found that many concepts observed in one project were mirrored in the other. Through the examination of Hurricane Katrina within the framework of actor-network theory, I identified numerous factors contributing to the breakdown of an actor-network. Armed with this understanding, my team was equipped to construct an actor-network for our stream restoration design that is poised to successfully address the challenges ahead. Drawing from my experience in my STS research and technical project, I am committed to fostering and managing diverse actor-networks as I transition into the professional realm of engineering, aiming not only to benefit the company but also to positively impact the clients and communities I engage with.