

UVa Ivy Corridor Site and Stormwater Management Design Proposal
(Technical Report)

Using Care Ethics to Examine the Salmon Decline Caused by the Grand Coulee Dam
(STS Research Paper)

An Undergraduate Thesis Portfolio

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Socio-Technical Synthesis: Water Resource Management and Society

My technical work and my STS research relate to another in that they both explore water resource management, as well as the effects that such management can have on society. Water resource management refers to the various ways in which people plan, engineer, and manage systems, primarily in the built environment, to optimize our use of the water available to us. While the design of systems for water management is the focal point of both my technical project and my research paper, they differ greatly in the intent of their respective designs. The primary focus of my technical work is the nexus of stormwater management and site design, and exploring how they can be curated to induce social productivity. My research, on the other hand, explores how the management of riverine water resources in the Pacific Northwest has been unethical because of the detriment it caused to societies by wiping out salmon populations. So, while my technical work and STS research explore water resource management in different contexts, the notion that systems can be designed to manage water in ways that greatly affect society is apparent in both projects.

In my technical report, I discuss the considerations for and design of a site layout and comprehensive stormwater management plan for a site that has been acquired by the University of Virginia for redevelopment. While the reduction of volume and removal of pollutants from stormwater runoff were a keystone of our design, another primary goal of the project was for the site to serve as a symbolic gateway to the University of Virginia grounds at the intersection of Emmet St. and Ivy Rd.. Facets of this latter goal include improving the arrival experience to Grounds, improving connectivity to North Grounds, and enhancing the mixed-use of space on the site. Additionally, our design employs three Best Management Practices (BMP's) to enhance stormwater ecology: a bioretention facility, a dry swale, and a wet pond. The BMPs greatly

contribute to the scenery and green space on the site with a wide variety of native plant species. The proposed buildings include new academic buildings with classroom spaces for students, retail space, as well as a large hotel for visitors. Our unique design fulfills all the regulatory requirements for treatment of stormwater runoff while also creating a space that is welcoming to everyone in the University community.

My STS research also explores a water resource management design, but primarily through the lens of its adverse effects. My research focuses on the ethics of designing and building the Grand Coulee Dam for hydropower generation in the Pacific Northwest, whereby the utility of rivers as habitat for millions of salmon was destroyed and the lives of people dependent on the salmon were upended. Care ethics theory is employed to show that the designers of the dam owed a duty of care to the people of the region and ultimately failed in their attentiveness, responsibility, competence and responsiveness to uphold that duty. The goal of my research is to stress the importance of ethics in designs for water resource management.

Working on these two projects in tandem added volumes of value to both. My technical work opened my eyes to the greater bandwidth of design to impact societies, which laid the groundwork and fueled my curiosity for exploring the greater responsibility and ethical dimensions intrinsic to water resource management. Simultaneously, the research I conducted afforded me insights into new design considerations necessary to ensure that a duty of care is delivered in combination with site performance. In conclusion, working on both my technical project and my STS research paper together provided me with insights regarding several dimensions of water resource management that would likely remain unbeknownst to me now had I completed the projects separately, and both projects are more robust as a result of that benefit.