Public Abstract
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The value of a wetland is represented in how much a society would value or put an importance to every function of the wetland. Understanding the hydraulics of wetlands is essential to help in the protection of natural wetlands and improving the design of constructed ones. The focus of this thesis is to investigate the means to structure hydraulic considerations in a study of the temporal and spatial occurrence of water in a wetland system. Flow, velocity, bed roughness and vegetation, size, shape, and depth are all important aspects of studying or designing any wetland. Measuring exactly how much water is being discharged from a wetland is quite difficult and for precise measurement, rating curves must be developed. Velocity of flow in open channels can be calculated by several empirical equations, such as Manning's Equation. By defining the storage capacity of a reservoir, or river, routing was performed while the outflow rate was less than the inflow rate. Results from the study focused on hydraulic concepts such as open channel sheet flow, hydraulically long channels, reservoir routing, wetland storage relationships, and water depth vs. distance profiles. A key finding was that depending upon size and elevation, water may flow from a downstream wetland to an upstream one. The higher the tailwater is, the less distance was needed for equilibrium to be reached. Additionally, a diagram was developed to illustrate step-by-step structure of the hydraulic calculations needed when modeling wetland systems.