INNOVATIVE SMART PONDS: HOW DO THEY WORK?

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Stormwater storage assets, such as ponds, constructed wetlands, and underground vaults, are often designed to provide both water quality and flood mitigation for a range of critical storm events (e.g., 2-year, 10-year, and 100-year storms), consequently, by design, these assets do not perform optimally for any individual storm event.

Advances in communications and control technology, cloud-computing, weather forecasting, and sensing technologies have now made it possible to optimize stormwater infrastructure for each individual storm event. One approach that leverages these technologies is continuous monitoring and adaptive control (CMAC). CMAC systems monitor the local weather forecast, compare the forecast runoff to existing field conditions by reading on-site sensors, and automatically control the timing and rate of stormwater discharge by actuating on-site valves, gates, or pumps. With adaptive controls, stormwater facilities discharge water in advance of storms, creating capacity for flood mitigation. CMAC systems then hold water during and after storms to increase hydraulic residence time, settle sediment and nutrients, and improve water quality. Adaptive controls are being used across the country to optimize stormwater management for water quality and flood mitigation.

The ease with which existing stormwater facilities can be retrofitted with CMAC lends itself to innovative project delivery models. For example, stormwater ponds owned by the Florida Department of Transportation are being retrofitted with adaptive controls to generate nutrient removal credits. These credits are then purchased by other entities to meet water quality goals. Because CMAC systems collect real-time continuous data on the weather forecast, precipitation, storage volumes, discharge rates, residence time, and water quality parameters, performance is being documented to assure regulatory compliance.

This presentation will provide a technical overview of CMAC, and present case studies of Florida communities using CMAC to improve water quality and mitigate flood risk with existing stormwater infrastructure. Quantitative performance data will be presented.

PRESENTER BIO: Mr. Thomasson is an Executive Vice President and Chief Stormwater Engineer with more than 30 years of experience planning, designing, and implementing stormwater projects. He has extensive experience with Environmental Resource Permitting and innovative stormwater treatment practices and has developed the proprietary models used for permitting in Florida.