

Innovative Smart Ponds: How Do They Work?

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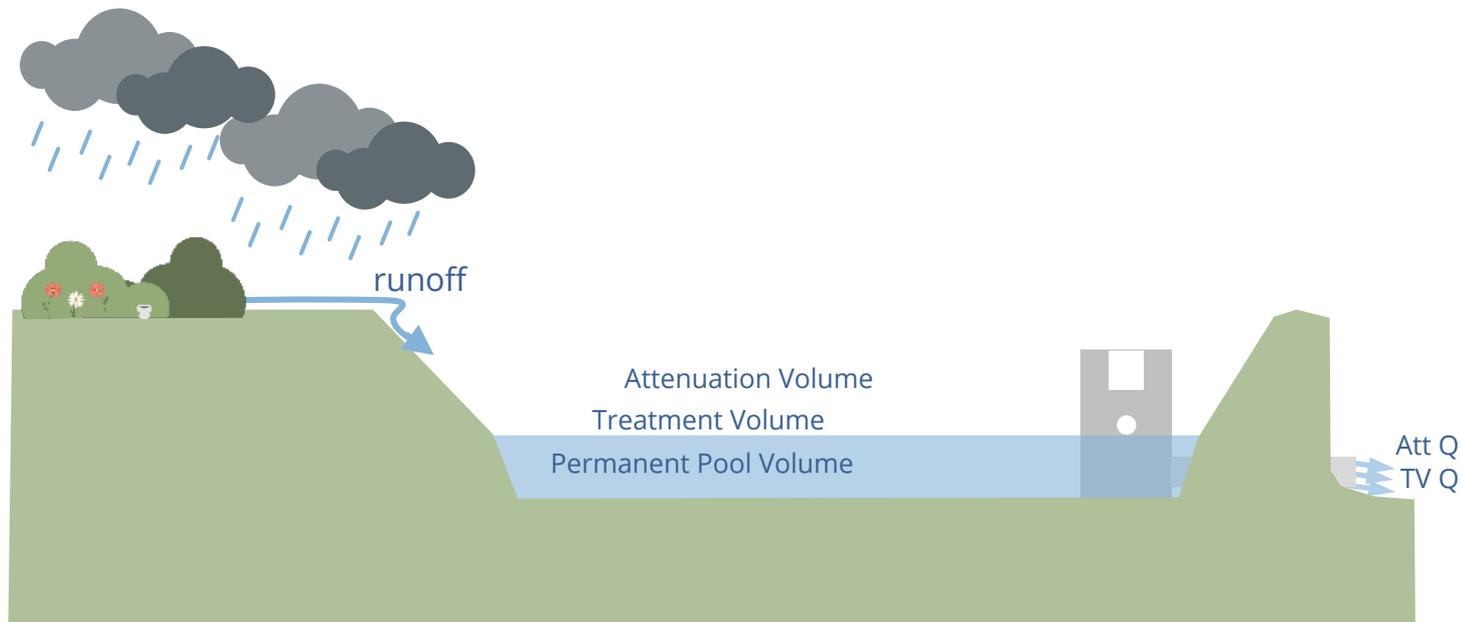
Standard Wet Detention Pond

Runoff (water in) = Discharge (water out)

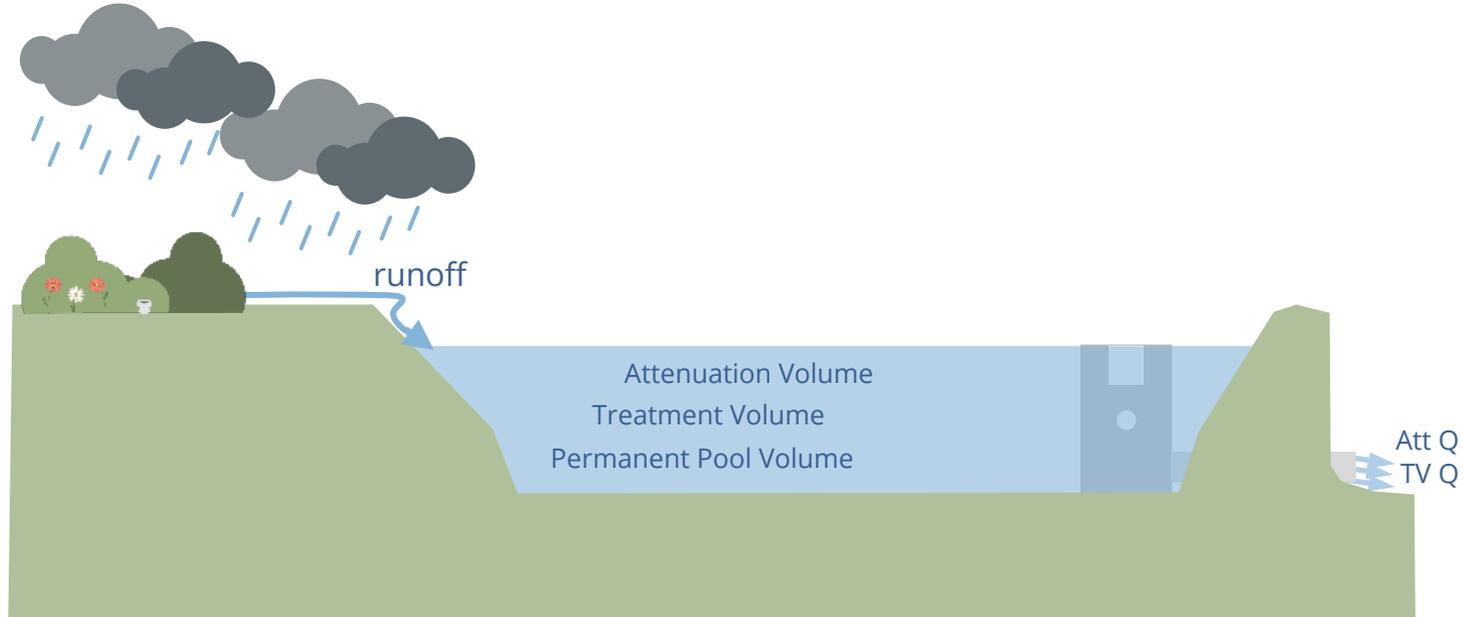
Configuration

Parameters

- PPV
- TV
- Pre/Post Q
- Wet Season RT
- AART



Standard Wet Detention Pond

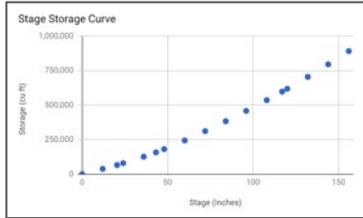


Configuration

Parameters

- PPV
- TV
- Pre/Post Q
- Wet Season RT
- AART

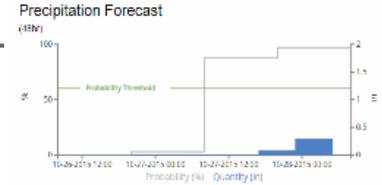
Smart Ponds (Continuous Monitoring and Adaptive Control - CMAC)



web-based dashboard



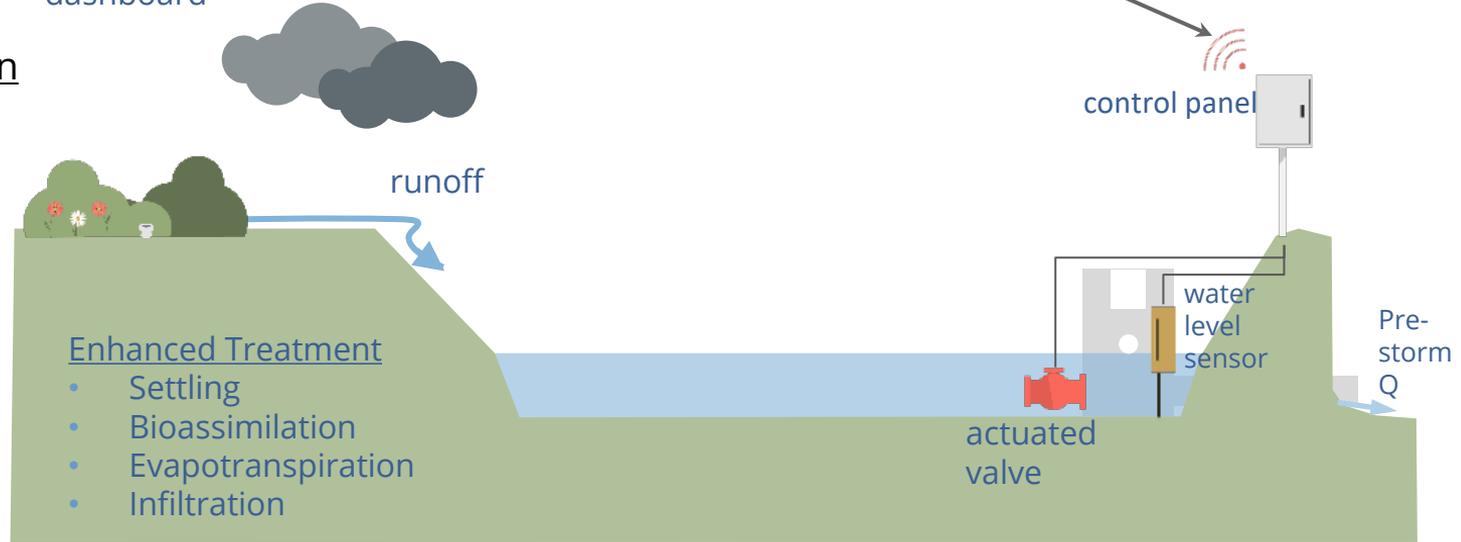
Real-Time Inputs → Model → Output



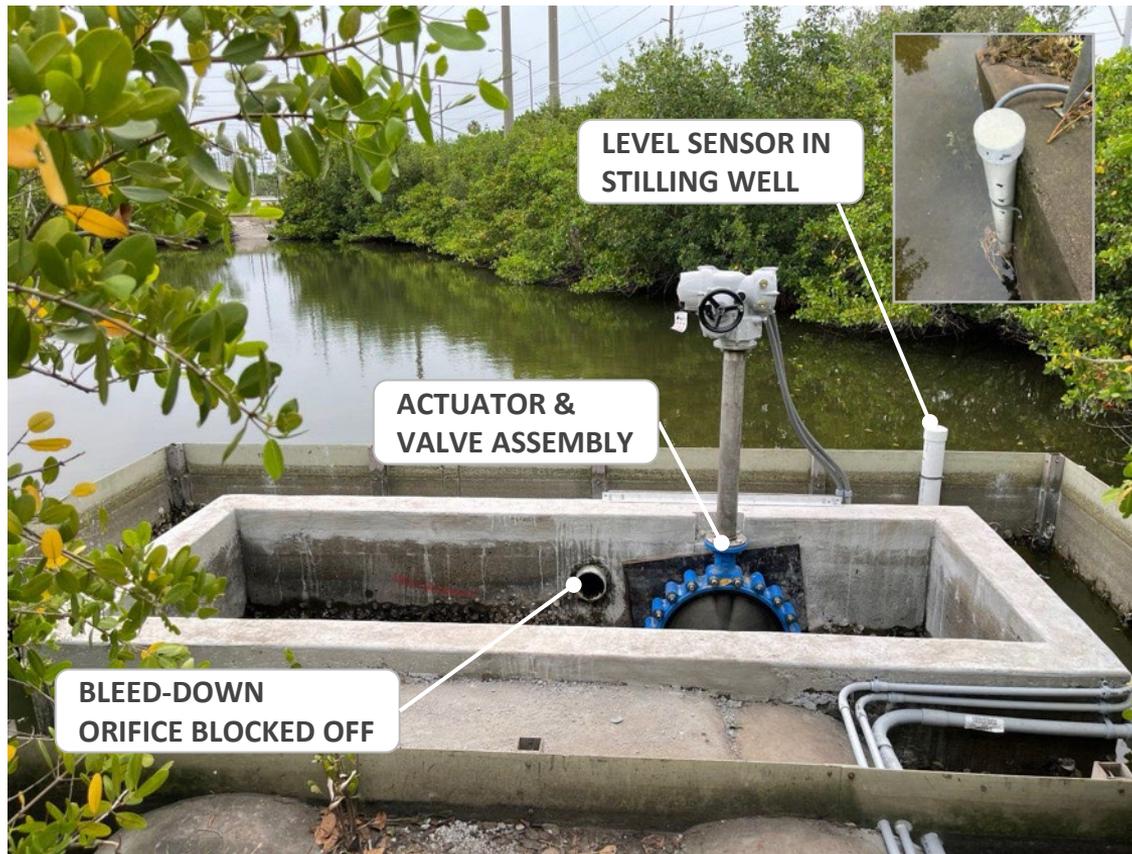
Product Configuration

Example Parameters

- Watershed Area
- Impervious Area
- Valve Diameter
- Overflow Invert
- Peak Discharge
- Retention Period
- Max Q

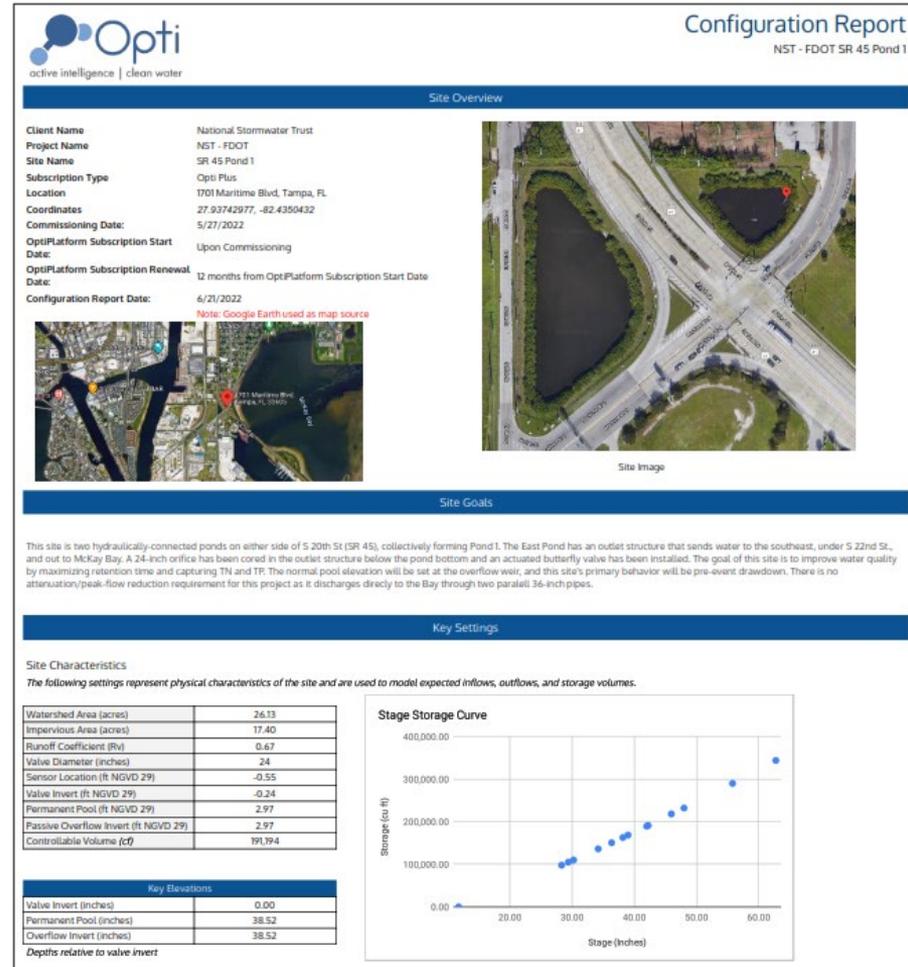


FDOT (SR 45 Pond 1) CMAC Retrofit

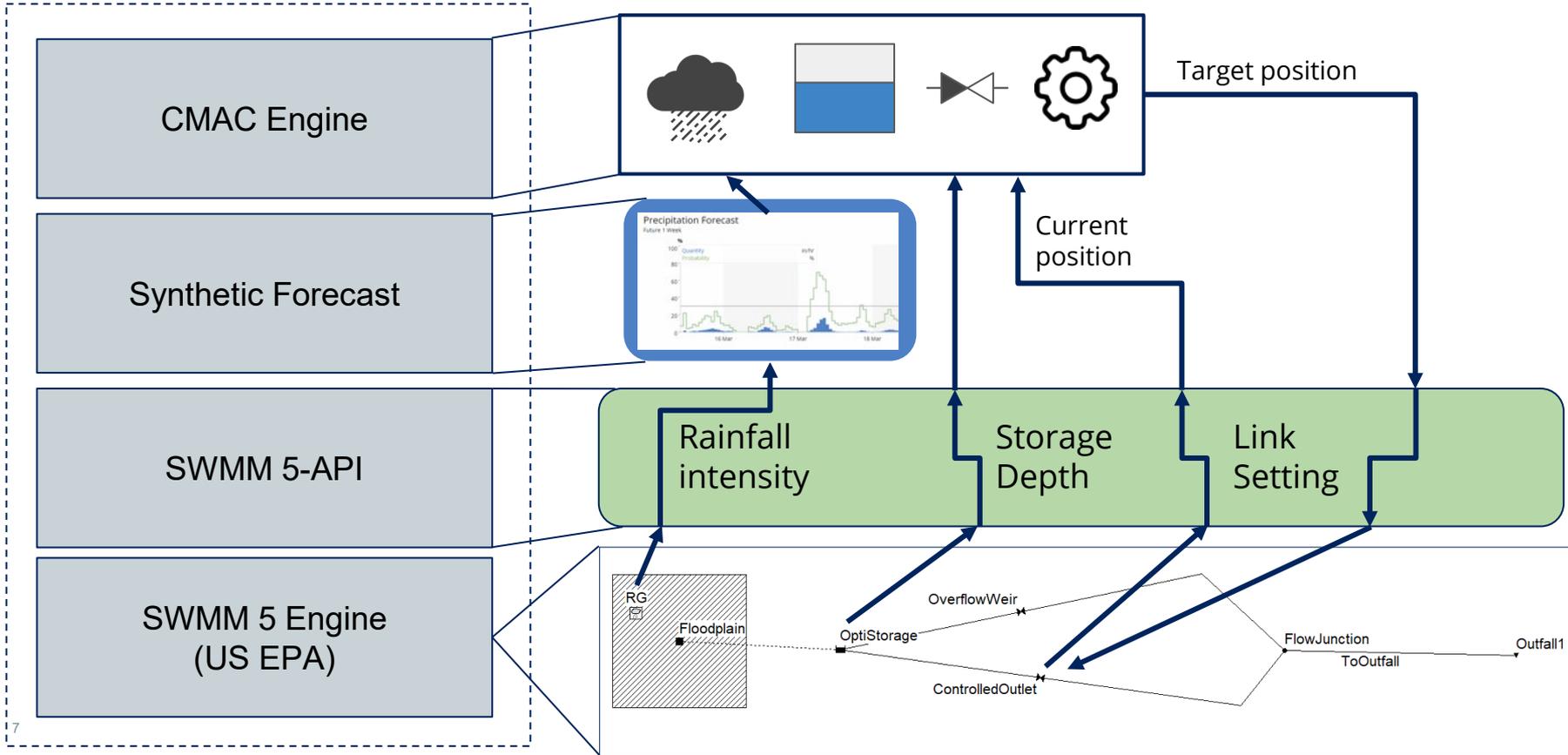


Configuration

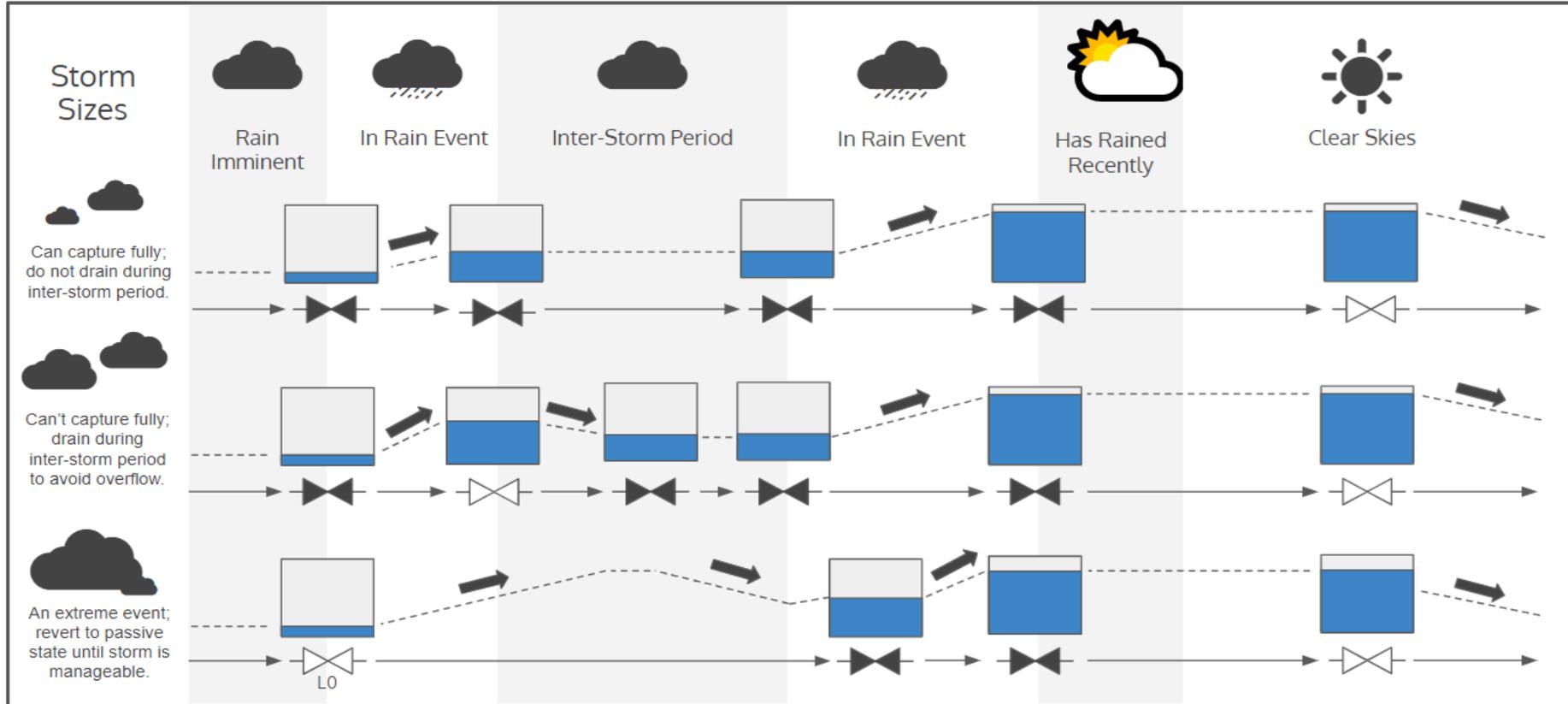
- Site characteristics (watershed area, drainage coefficient, etc.)
- Operational parameters (normal pool elevation, max drawdown rate, etc.)
- Forecast response (probability and quantity thresholds)
- Operational Regime (water quality, flood reduction, water harvesting, recharge, etc.)



Simulation



CMAC Automated Decision Making



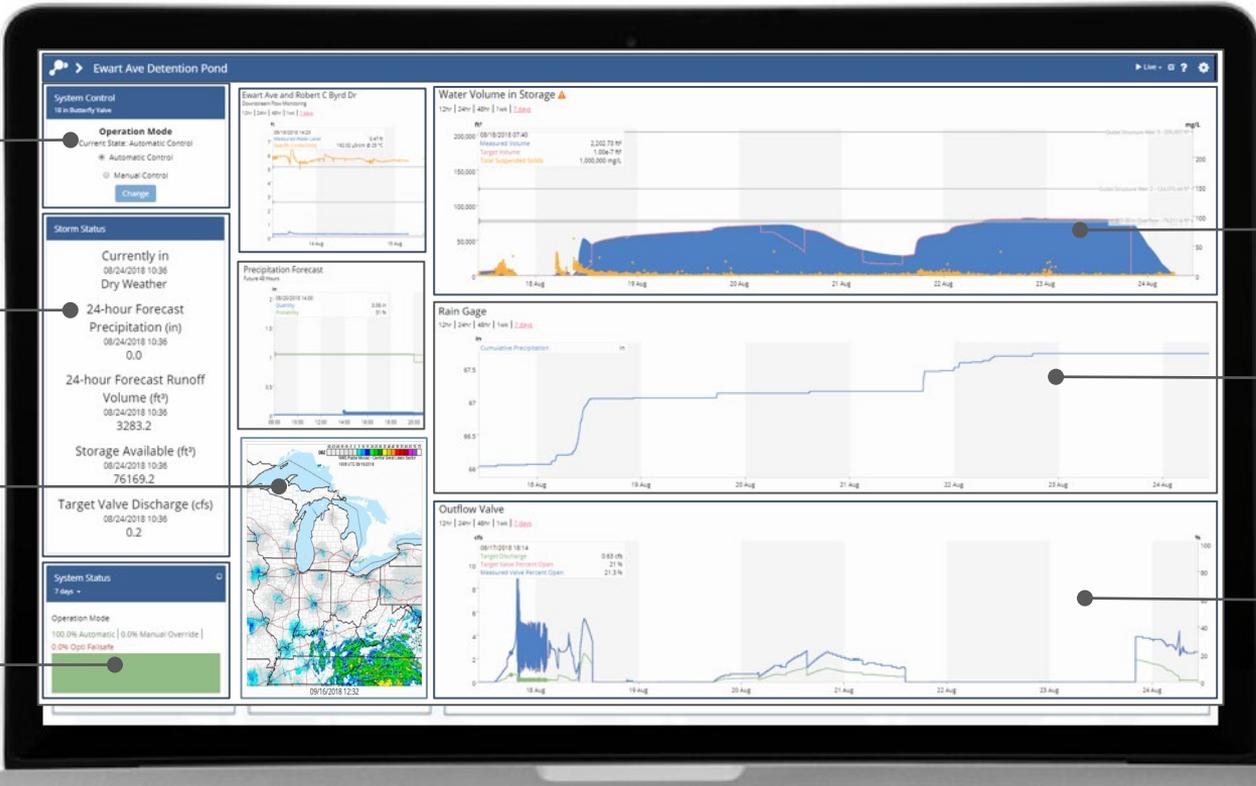
Robust Operational Controls

**MANUAL
OVERRIDE**

**CURRENT
CONDITIONS**

**FORECAST
VIEW**

**ONLINE
STATUS**

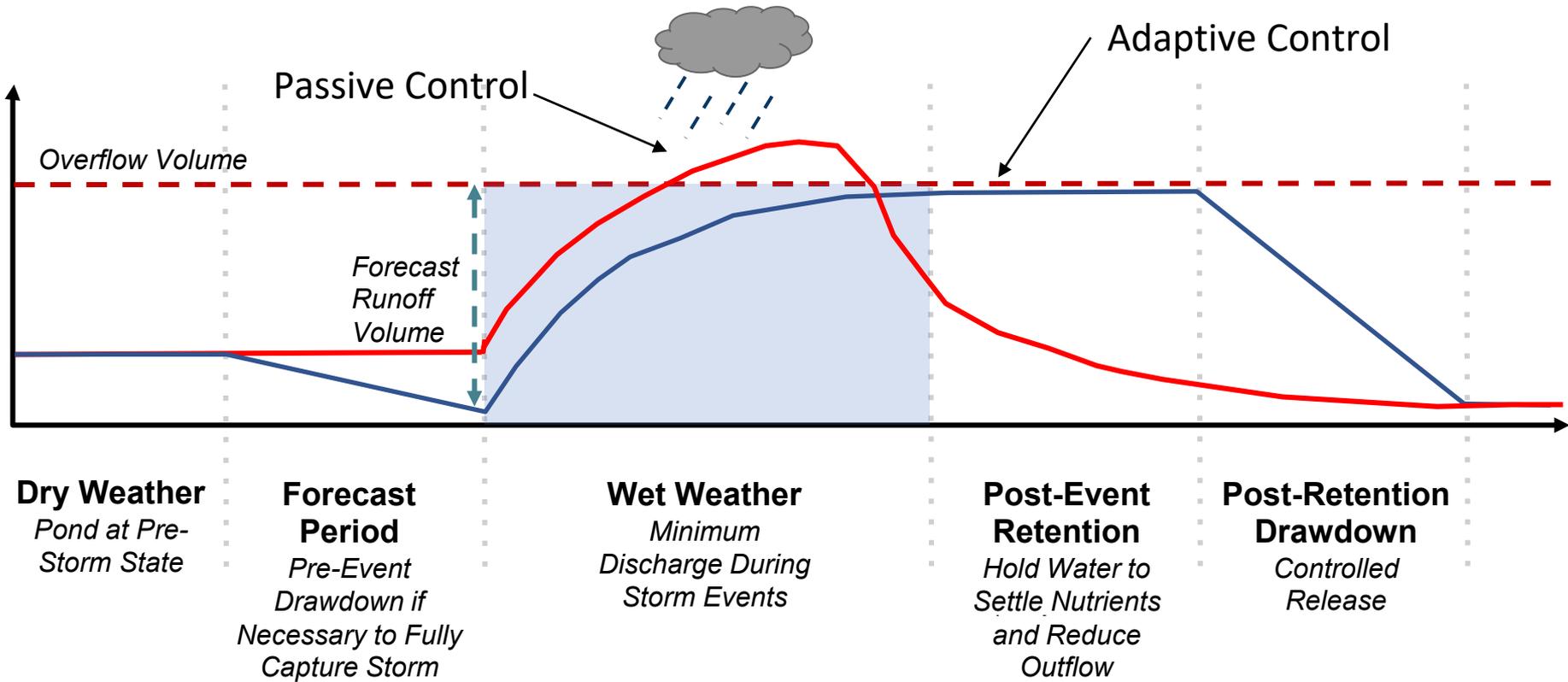


**MANAGED
STORAGE**

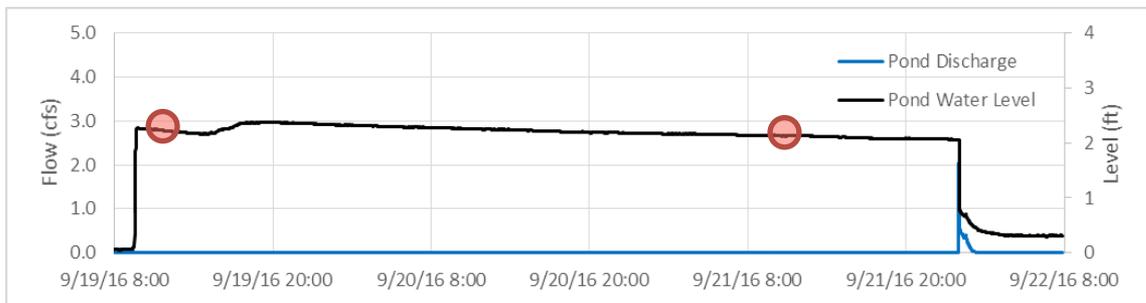
**CUMULATIVE
RAIN GAUGE**

**VALVE
POSITION**

Optimized Storm-Based Control



Dry Pond – September 19, 2016 Rainfall Event

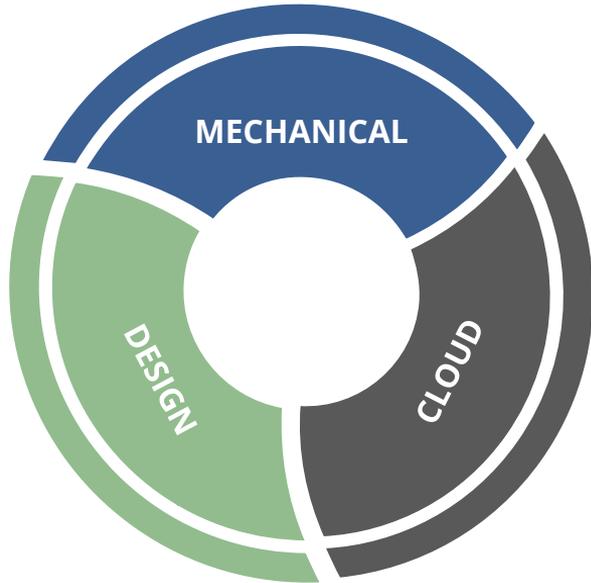


9/19/2016 9:35AM

9/21/2016 10:04AM



Risk Management



Cloud-Based:

- Email Alerts
- Remote Manual Control
- Encrypted Communication
- Product Release Cycles
- 3rd Party Security Audit

Mechanical:

- Battery Backups
- Local Fail-Safe Logic
- Onsite Manual Control

Civil Design:

- Passive Overflow
- Downstream Condition Assessment