



# DIVING INTO PUBLIC NOTIFICATION OF CSO ACTIVATION

*June 24, 2020*

# Agenda

1. **CSO System Notification Drivers**
2. **Concerns & Considerations**
3. **Program Evolution & Reporting**
4. **Questions?**



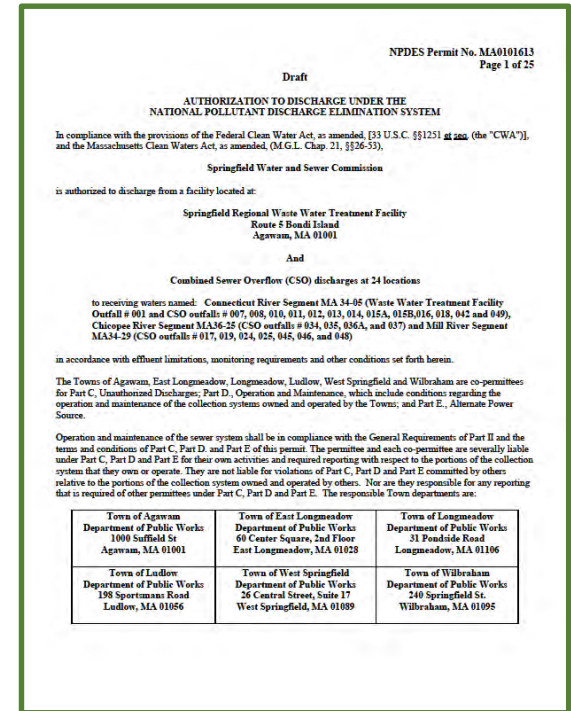
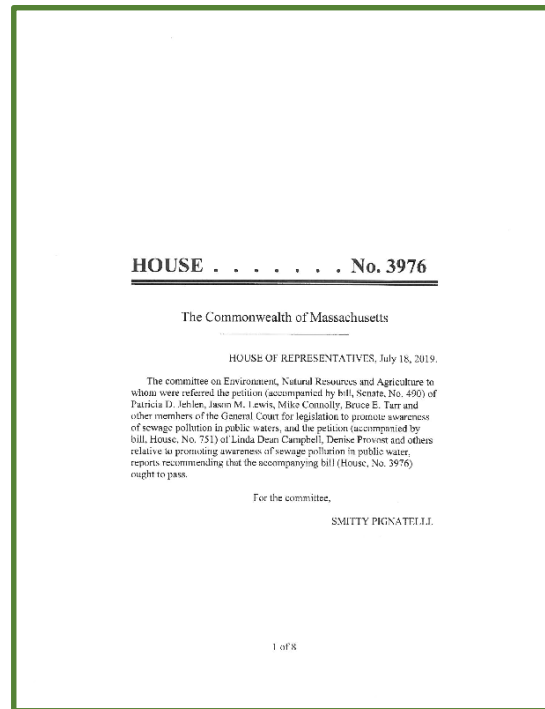
# It's Time for Change

- **Public Perception & Education**
- **Spotlight on *Polluters***
- **Real-time Culture**
- **Common Sense**



# Permits and Legislation

- NPDES Permit
  - State
  - Region
  - National
- State Legislation



# SWSC's CSO Monitoring and Notification Program Evolution

- **Qualitative**
- **Quantitative**
- **Volumetric**
- **CSO Control vs. Typical Year Design**
- **Analyses of Metered Year vs. Typical Year**
- **Analyses of Modeled Year vs. Metered Year**
- **Analysis of Rain Events**
- **Analysis of Metered vs. Modeled vs. Typical Year**



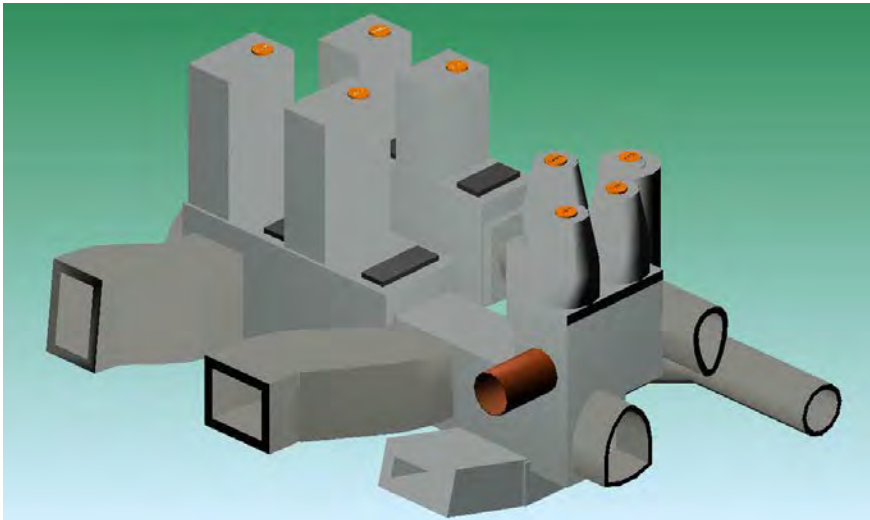
# Notification Considerations

- Timing
- Notification Methodology
- CSO Identity
- Volumes
- Metered/Modeled/Predicted
- Cost
- Accuracy

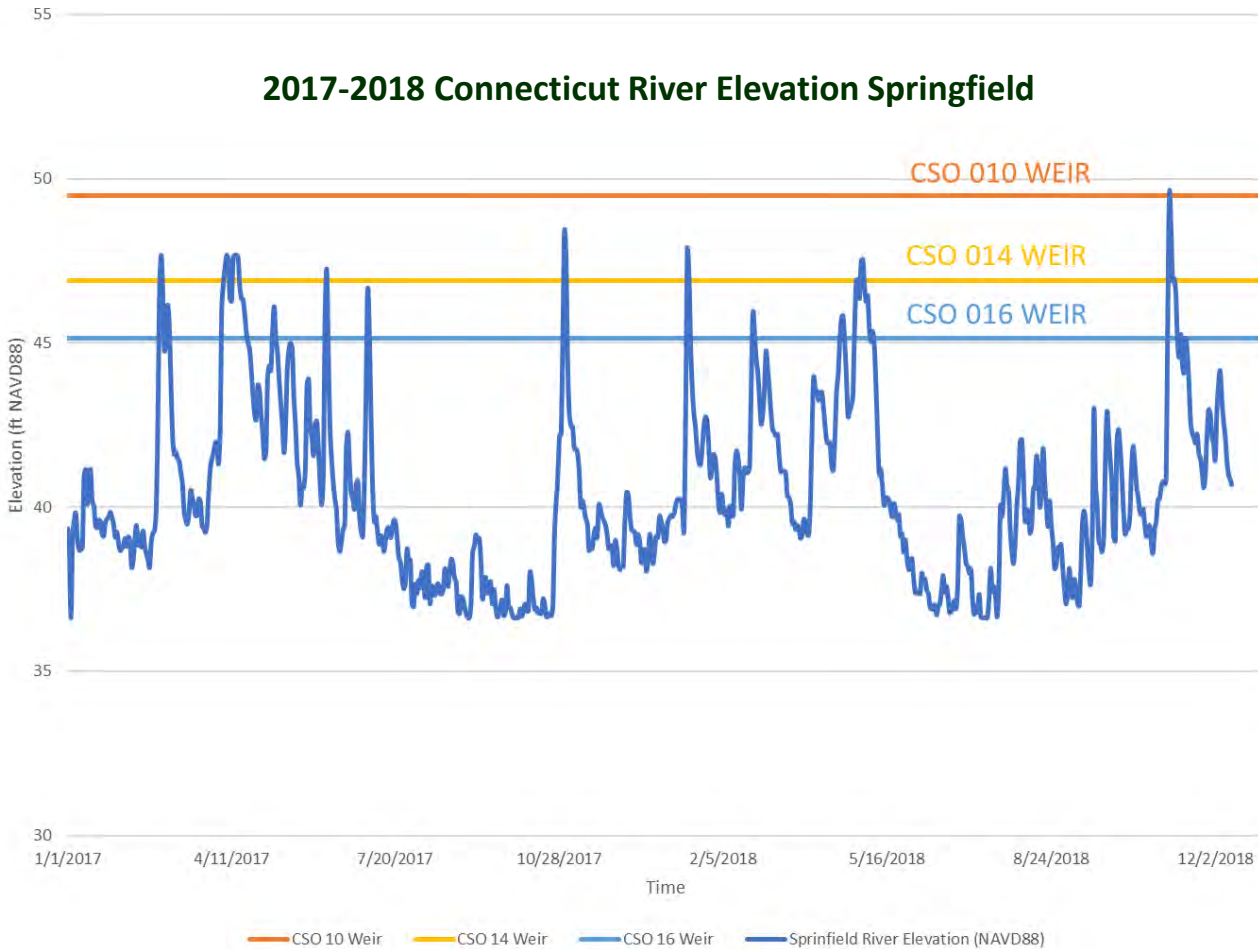


# Reporting Accuracy Considerations

- **Tidal & Backwater**
- **Raw vs. Processed Data**
- **Complex Structures & Modulating Control Mechanisms**
- **Volumetric Reporting**
- **Spatial and Temporal Variability & Rain Gauge Distribution**

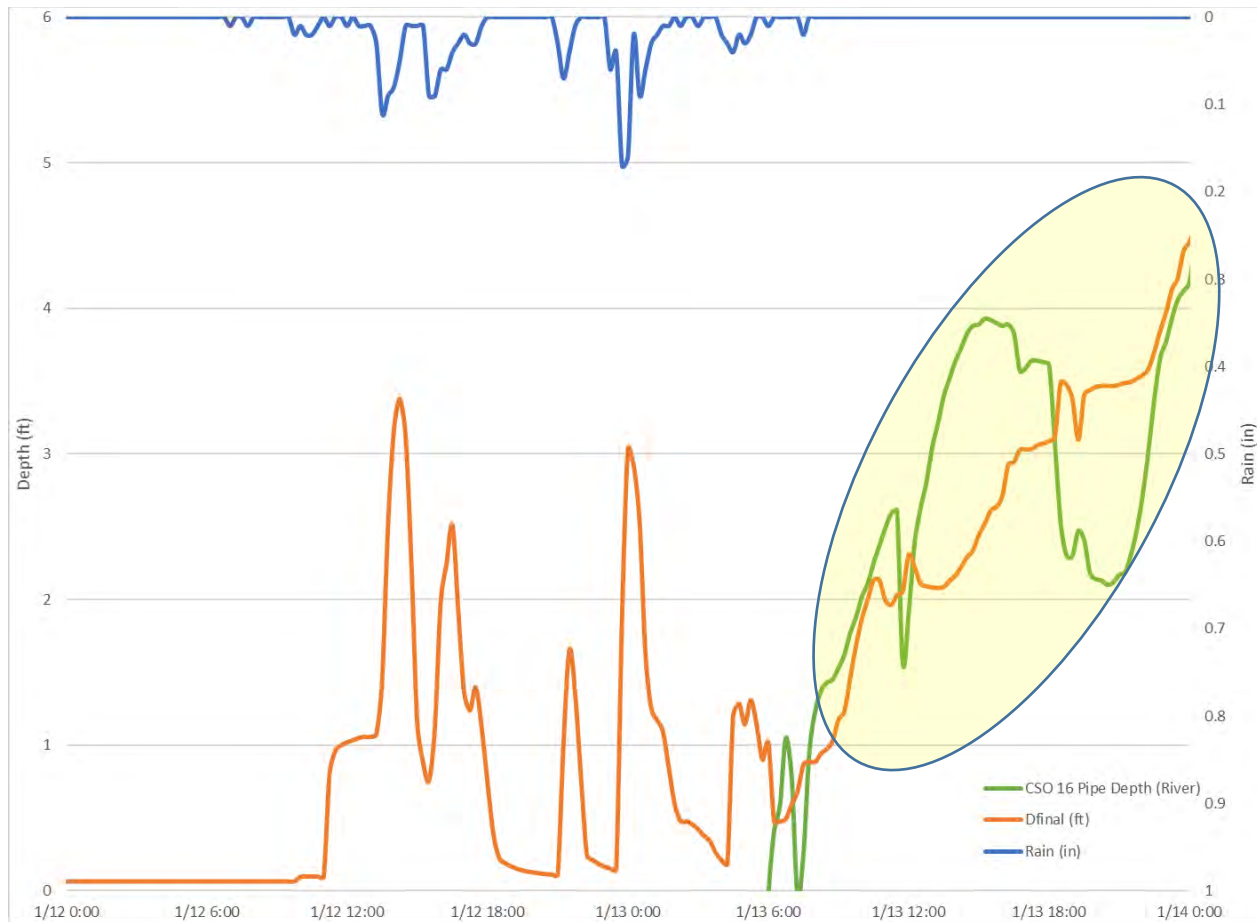


# Challenges Associated with Metering Accuracy: Outfall Meters and River Level





# Challenges Associated with Metering Accuracy: River Level Impact on Outfall (CSO0016 Example)



# Metering Limitations – Overflow Volume Calculations

Missing flow data with corresponding depth and velocity

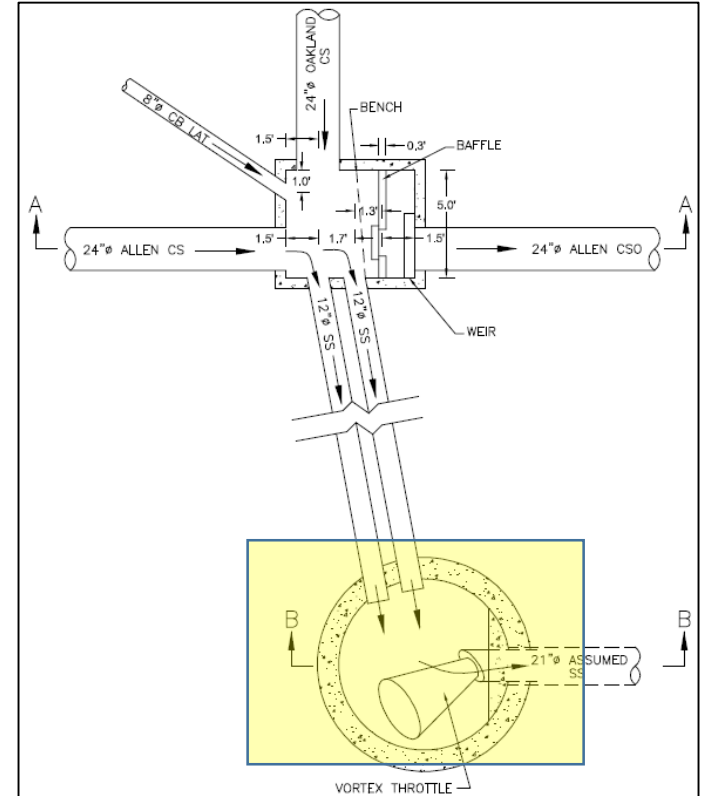
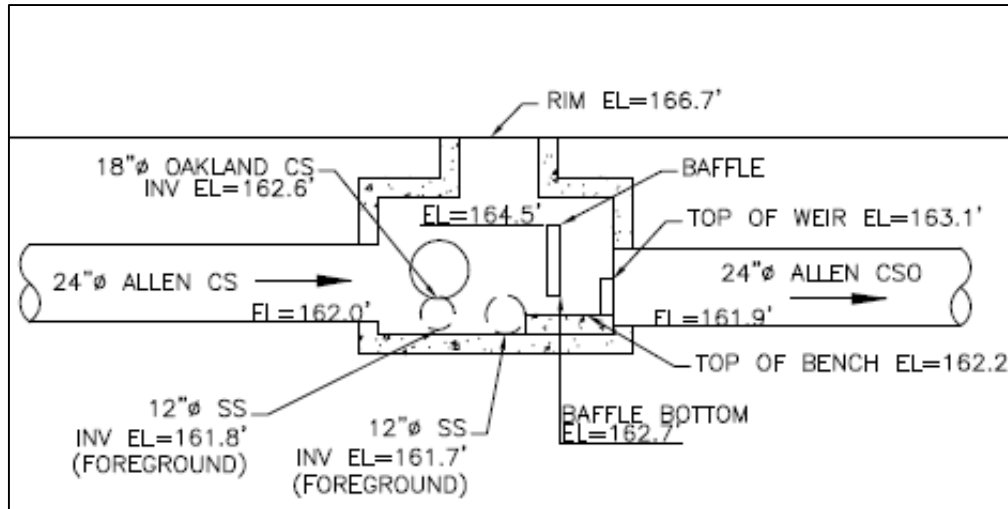
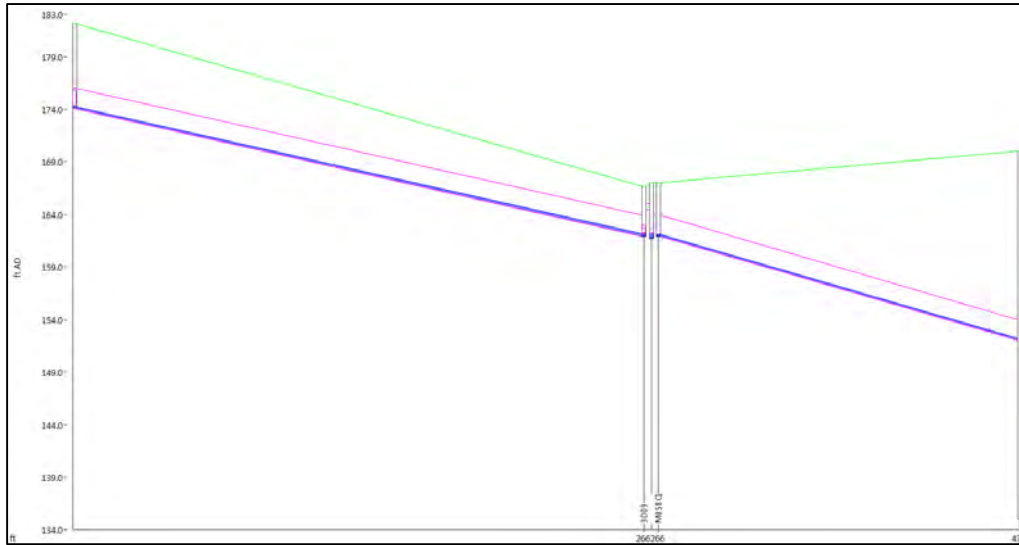
DateTime	UniDepth (in)	VFINAL (ft/s)	QContinuity (MGD)
06/06/2017 09:00:00	0	0	0
06/06/2017 09:15:00	3.66	2.12	0
06/06/2017 09:30:00	13.77	1.5	0
06/06/2017 09:45:00	14.4	1.43	0
06/06/2017 10:00:00	15.73	1.27	0
06/06/2017 10:15:00	15.45	2.4	5.158
06/06/2017 10:30:00	13.22	1.56	0
06/06/2017 10:45:00	12.42	1.64	0
06/06/2017 11:00:00	8.8	2.03	0
06/06/2017 11:15:00	4.01	2.29	0
06/06/2017 11:30:00	2.39	0.56	0.081
06/06/2017 11:45:00	1.25	0	0
06/06/2017 12:00:00	0.98	0	0
06/06/2017 15:15:00	7.07	3.22	2.298
06/06/2017 15:30:00	9.84	1.87	0
06/06/2017 15:45:00	9.91	1.74	2.013
06/06/2017 16:00:00	9.27	1.68	1.77
06/06/2017 16:15:00	7.93	1.9	1.598
06/06/2017 16:30:00	8.59	2.11	0
06/06/2017 16:45:00	12.15	1.66	0
06/06/2017 17:00:00	9.81	1.87	0
06/06/2017 17:15:00	4.28	2.42	0
06/06/2017 17:30:00	2.03	0.33	0.038
06/06/2017 17:45:00	2.65	1.55	0
06/06/2017 18:00:00	1.02	0	0
06/06/2017 18:15:00	0.85	0	0

0.3 MG

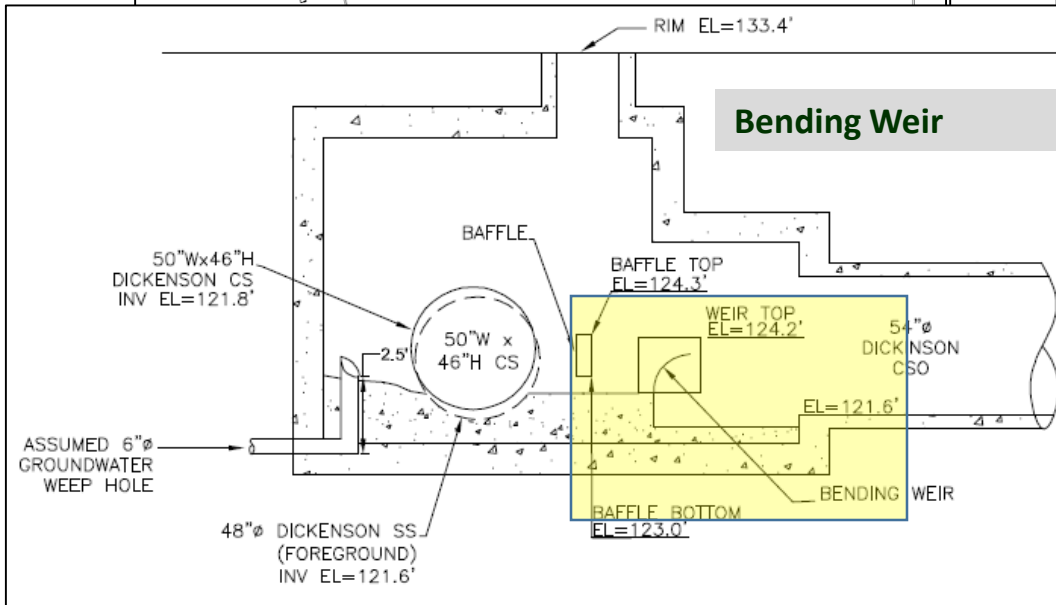
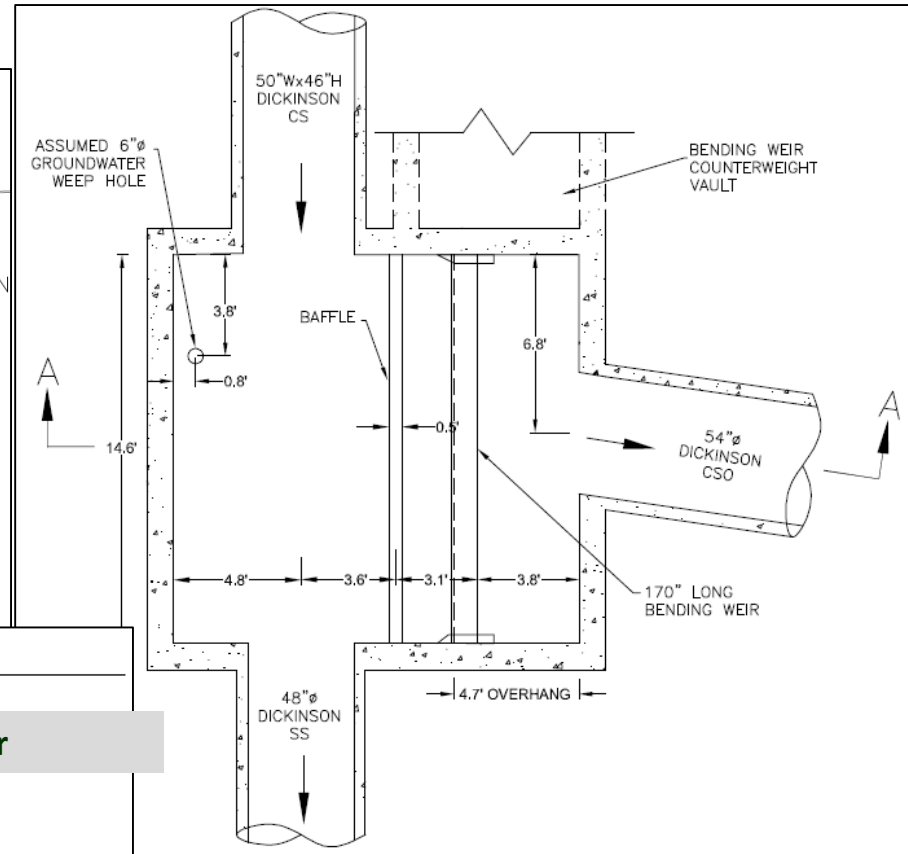
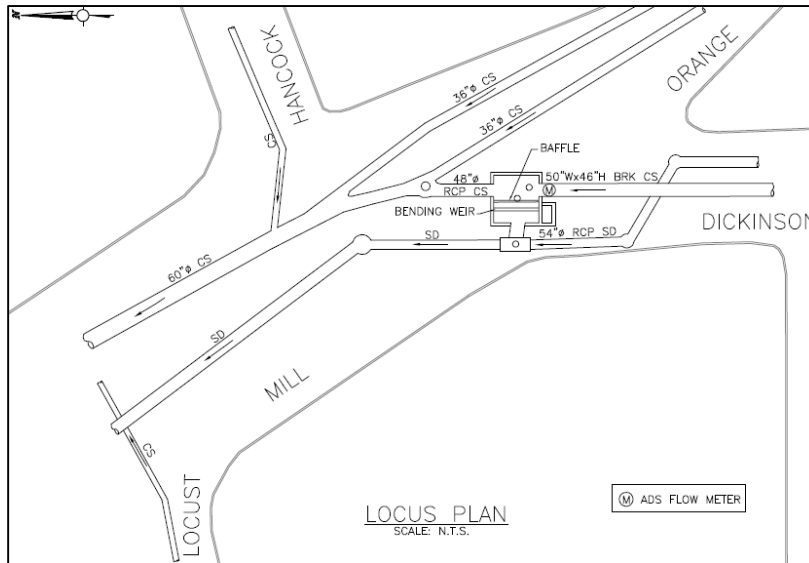
DateTime	UniDepth (in)	VFINAL (ft/s)	QContinuity (MGD)
06/06/2017 09:00:00	0	0	0
06/06/2017 09:15:00	3.66	2.12	0.578
06/06/2017 09:30:00	13.77	1.5	2.763
06/06/2017 09:45:00	14.4	1.43	2.804
06/06/2017 10:00:00	15.73	1.27	2.813
06/06/2017 10:15:00	15.45	2.4	5.158
06/06/2017 10:30:00	13.22	1.56	2.71
06/06/2017 10:45:00	12.42	1.64	2.605
06/06/2017 11:00:00	8.8	2.03	1.99
06/06/2017 11:15:00	4.01	2.29	0.714
06/06/2017 11:30:00	2.39	0.56	0.081
06/06/2017 11:45:00	1.25	0	0
06/06/2017 12:00:00	0.98	0	0
06/06/2017 15:15:00	7.07	3.22	2.298
06/06/2017 15:30:00	9.84	1.87	2.142
06/06/2017 15:45:00	9.91	1.74	2.013
06/06/2017 16:00:00	9.27	1.68	1.77
06/06/2017 16:15:00	7.93	1.9	1.598
06/06/2017 16:30:00	8.59	2.11	1.989
06/06/2017 16:45:00	12.15	1.66	2.565
06/06/2017 17:00:00	9.81	1.87	2.131
06/06/2017 17:15:00	4.28	2.42	0.828
06/06/2017 17:30:00	2.03	0.33	0.038
06/06/2017 17:45:00	2.65	1.55	0.263
06/06/2017 18:00:00	1.02	0	0
06/06/2017 18:15:00	0.85	0	0



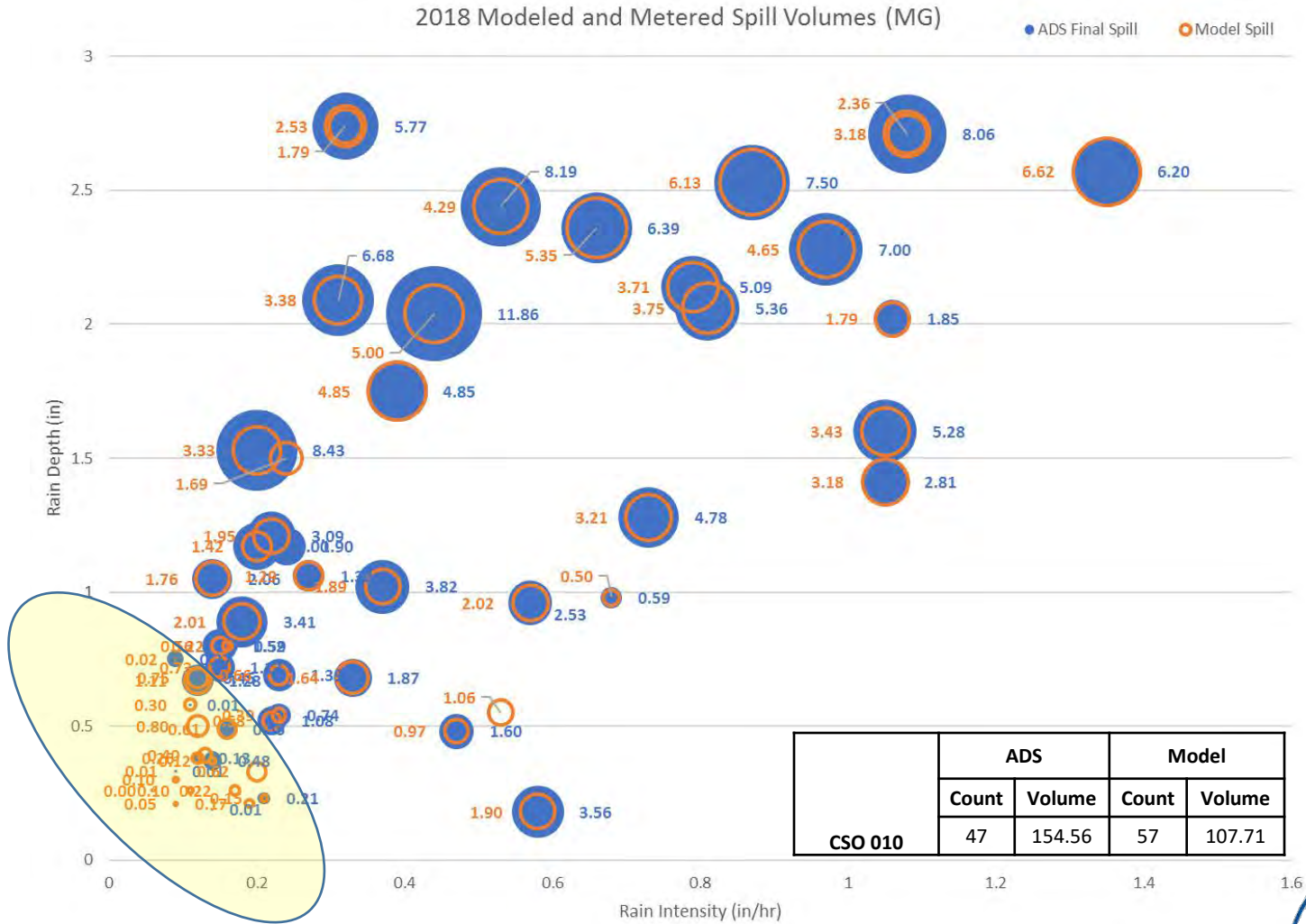
# Modeling Complex Regulators – Vortex Throttles



# Modeling Complex Regulators – Bending Weirs

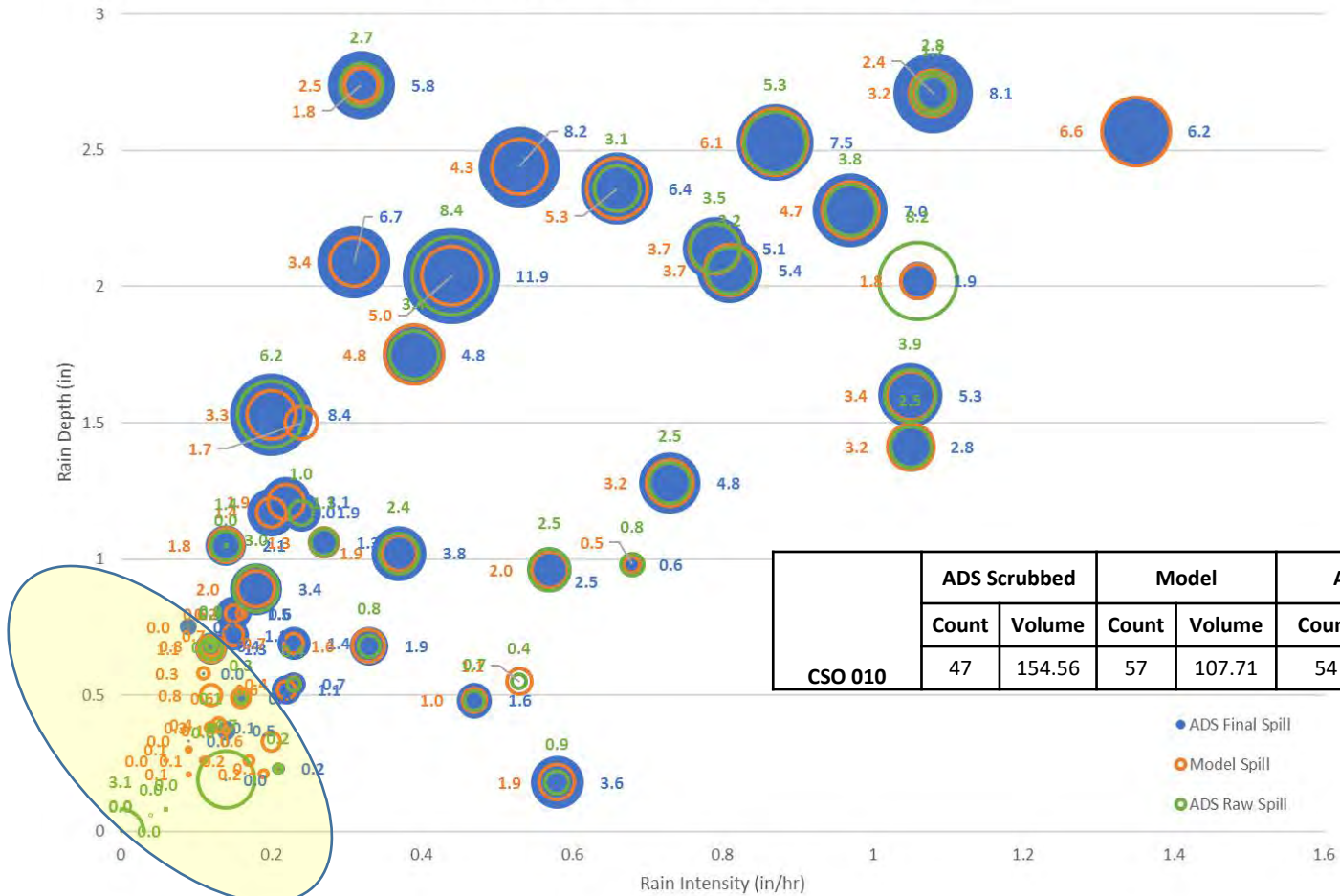


# CSO 010 – 2018 Model vs. Meter



# CSO 010 – 2018 Model vs. Meter Raw and Scrubbed

2018 Modeled and Metered Spill Volumes (MG)



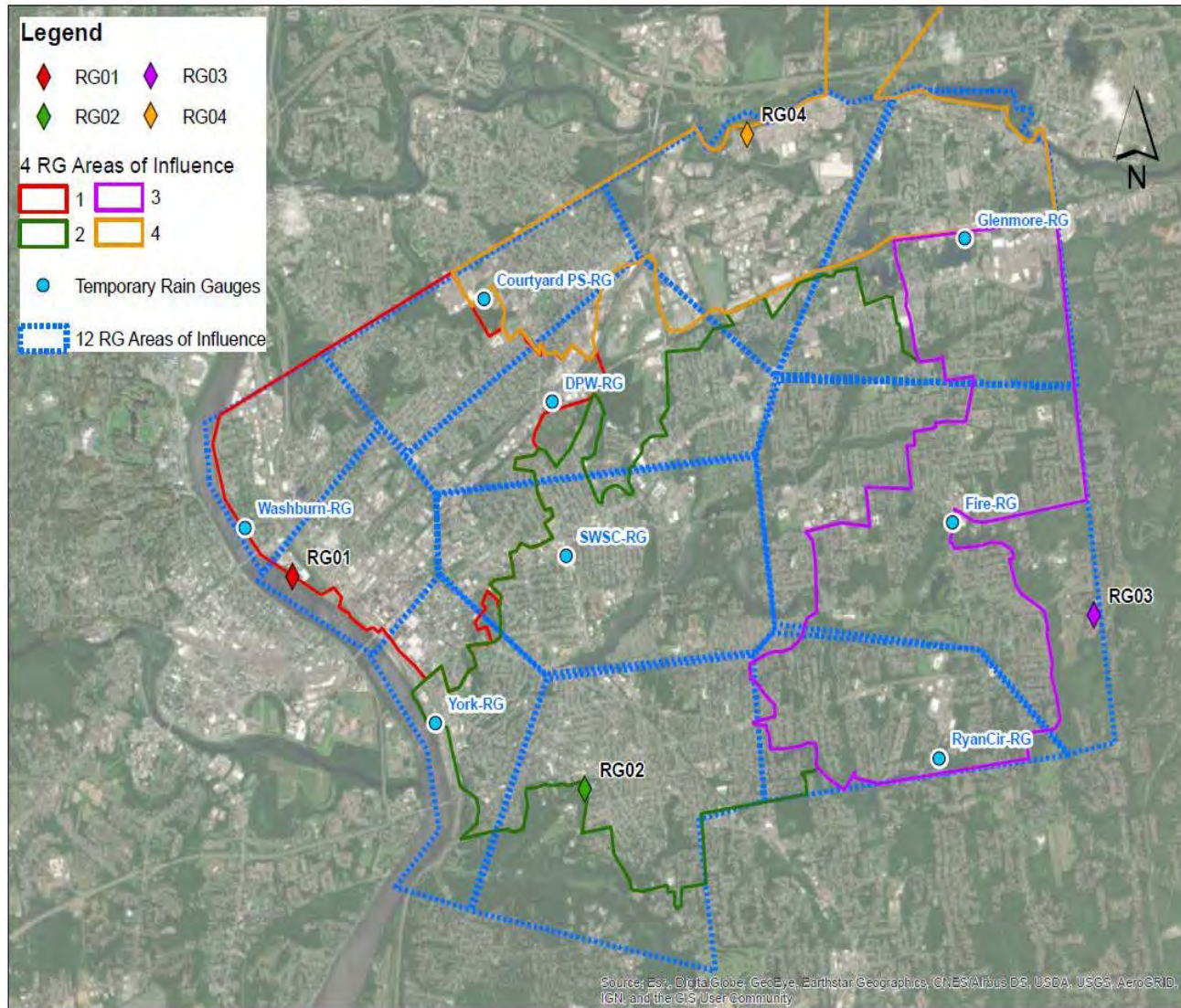
CSO 010	ADS Scrubbed		Model		ADS Raw	
	Count	Volume	Count	Volume	Count	Volume
	47	154.56	57	107.71	54	102.21

- ADS Final Spill
- Model Spill
- ADS Raw Spill



# Variability in Rain Characteristics 12 Gauges

with 4 vs.



# More Rain Gauge Data- Overflow Volume Simulations

**Reduction of approximately 25% spill volume in each of the two largest storm events in 2019**

CSO	4 Gauges Spill Volume (US MG)	12 Gauges Spill Volume (US MG)	Meter Spill Volume (US MG)	4 Gauges Spill Volume (US MG)	12 Gauges Spill Volume (US MG)	Meter Spill Volume (US MG)
	October 17, 2019			December 8, 2019		
CSO_007	0.35	0.41	0.10	-	-	-
CSO_008	1.73	2.12	NA*	-	-	-
CSO_010	8.05	7.63	5.95	2.13	2.07	1.95
CSO_012	10.90	8.87	NA*	4.26	2.67	1.26
CSO_013	2.26	0.51	2.60	-	-	-
CSO_014	2.26	1.39	1.49	0.18	0.11	0.15
CSO_015A	2.88	1.08	0.71	-	-	-
CSO_015B	0.07	0.01	0.02	-	-	-
CSO_016	5.45	3.21	3.31	0.61	0.50	NA**
CSO_034	0.02	0.00	0.01	-	-	-
CSO_046	0.01	0.01	0.19	-	-	-
CSO_049	0.10	0.06	0.16	-	-	-
<b>Total (MG)</b>	<b>34.08</b>	<b>25.29</b>	<b>14.55</b>	<b>7.19</b>	<b>5.34</b>	<b>3.36</b>

\*Data unreliable due to no float switch activation

\*\*Data not reliable (snow melt)





# Notification vs. Solving the Problem

## Opportunities Abound

- **Amplify Broader Water Quality and Economic Challenges**
- **Advocacy for Funding to Solve the Problem**
- **New Partnerships**
- **Increased Exposure = Leverage with Legislation**
- **Other Funding Programs**

