

Timeliness or Accuracy? Balancing Competing Needs for CSO Notifications

New England Water Environment Association
CSO/Wet-Weather Specialty Conference
Lowell, Massachusetts



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Today's Presenters

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Today's Presentation

- Requirements for CSO reporting & notification
- About CSO monitoring and associated equipment
- Advances in monitoring technology
- Monitoring trouble spots
- 24-hour notification process
- Lessons learned (& still to be learned)

CSO Reporting

(MOST) RECENT PERMITS, MUST REPORT:

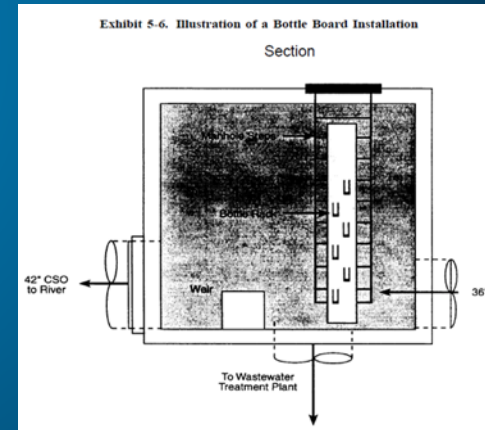
- CSO discharge
 - Volume
 - Duration
- Precipitation
 - Total inches of rainfall
 - Rainfall duration
 - Inches of rain in one-hour intervals for CSO activations



CSO Reporting

DATA SOURCES FOR CSO REPORTING:

- Manual / computerized estimates based on rainfall
- Manual measurement (e.g., block, bottle board, chalk, etc.)
- Automated flow measurement
- Camera / video recording
- Some combination of these



CSO Monitoring

AUTOMATED FLOW MONITORING EQUIPMENT:

- Pressure Transducers
- Ultra-sonic Sensors
- Area-velocity Sensors
- Radar Level and Velocity Sensors
- Any combination of the above

Pressure Transducers



Ultra-sonic Level Sensors



Area-velocity Sensors



Cameras / Video Monitoring



Rain Gauges

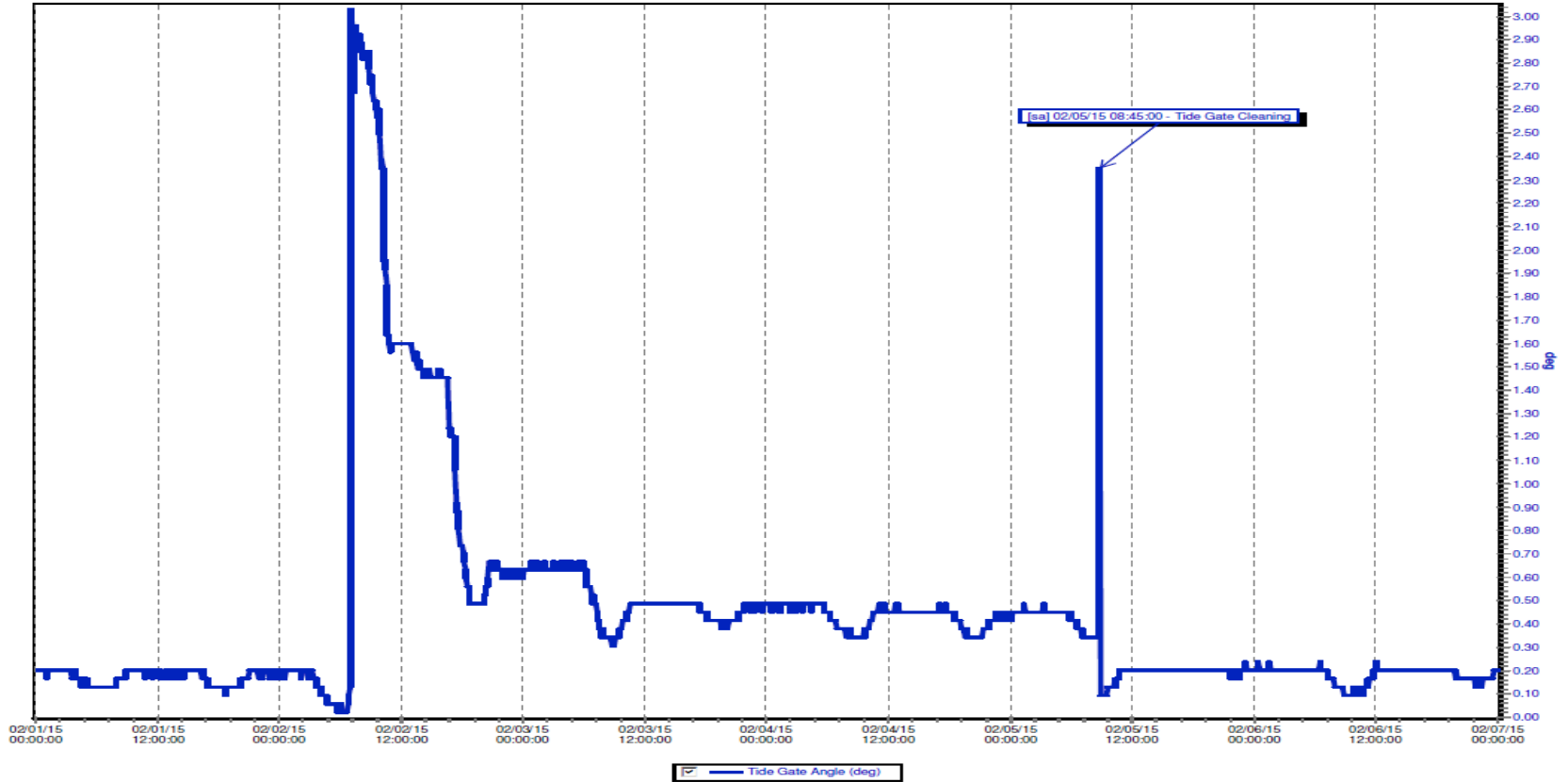


Advances in Technology

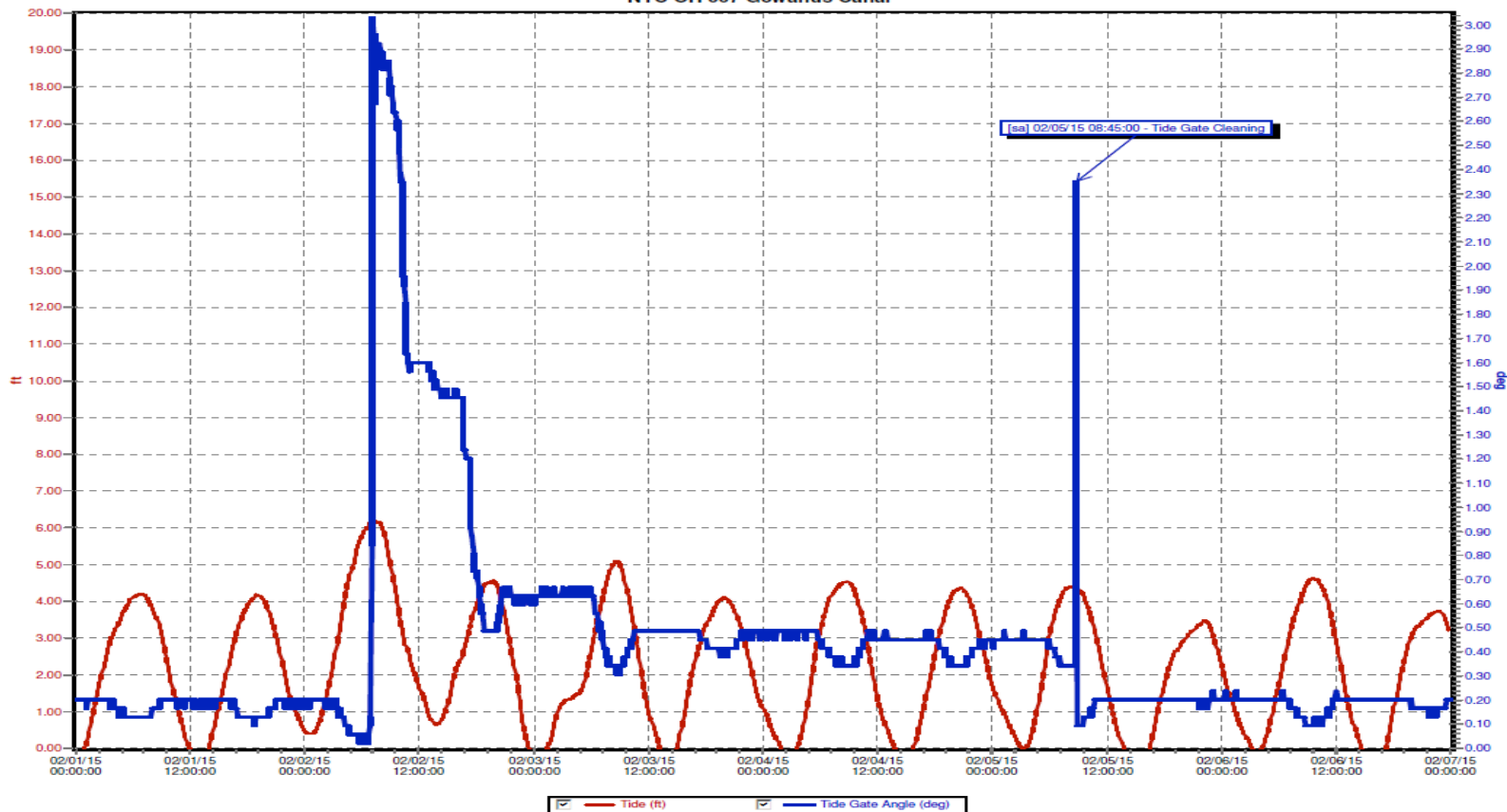
INCLINOMETERS:

- Sealed solid state device
- Produce data to a fraction of degree
- Economical
- Low voltage

NYC OH 007 Gowanus Canal



NYC OH 007 Gowanus Canal



— Tide (ft) — Tide Gate Angle (deg)

Flow Monitoring Manufacturers

- Teledyne Isco
- Telog
- Hach
- ADS
- FloWav
- Sontec
- Blue Siren

Telemetry Systems



Telemetry Antenna



OVERCOMING OBSTACLES

Where does that even go?

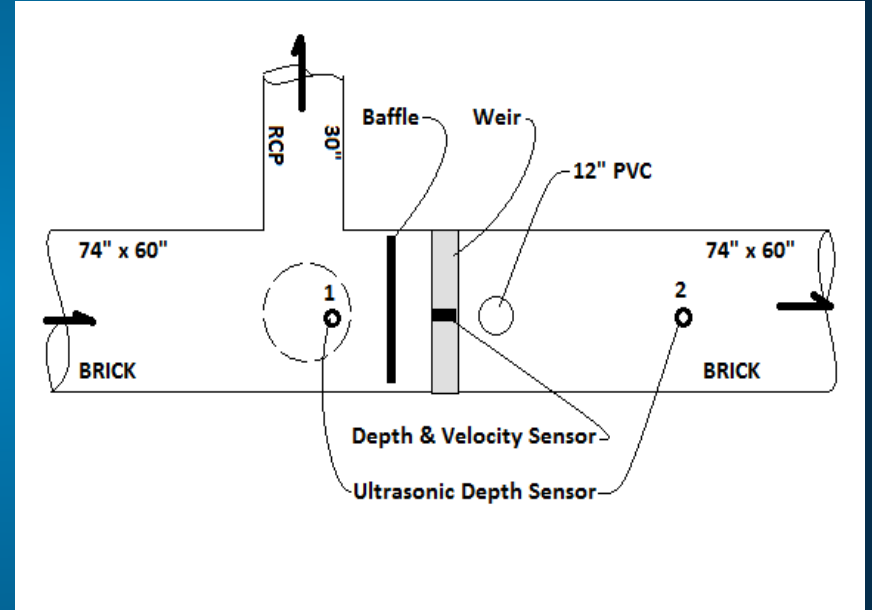
Leaping Weir



Wormhole



Baffled by Baffles!



Zero to a Hundred in 60 Seconds!



Surf's up!



Variations Pipe Material



Extremely Large Weirs



Surcharging



Debris



02/25/2015

Variations in Pipe Shape



Redundancy is Key!



Real Time Alarms & Alerts

ALARMS (CONDITION):

- Occurs when a defined condition is met
- Any recorded data channel
- High or low condition

ALERTS (DATABASE):

- Occurs at database level
- Loss of communication
- Constant condition (e.g., sensor failure)
- Dry weather overflow

CSO Monitoring

BENEFITS OF TELEMETERED FLOW MONITORING:

- Allows municipalities to take action based on current conditions
- Can provide status of tidegates to a fraction of a degree
- Alarms / alerts
- Allows sampling of CSO discharges
- Prevents / minimizes dry weather overflows

CSO Monitoring

BENEFITS OF WEB-BASED DATA:

- Easy access to data from anywhere
- Secure data sharing
- Customized viewing / reporting of data for your specific needs
- Infinite storage

CSO Reporting

CSO “REPORTING” REQUIREMENTS:

- Annual Report
- Monthly NetDMR
- Annual press release
- Website postings

Reporting (notification) of CSOs is no longer just to federal and state regulators; now its to the public and, for many, to a set of identified stakeholders too

CSO Notification

NOTIFICATION REQUIREMENTS - VARY WIDELY:

- Hartford CT (2005?): none
- Providence RI (2001): NMC #8 only
- Boston MA (2003): annual reporting to EPA/DEP
- Haverhill MA (2007):
 - 24 hour notification to agencies & downstream WTPs
 - Quarterly web-postings
- Chelsea MA (2013):
 - 24 hour notification to all listed stakeholders
 - Annual web-postings



CSO Notification

*You might not be doing it yet,
but you most likely will be
in the not-so-distant future
(next permit cycle or two)*

CSO Notification

TO MAKE 24-HOUR REPORTING HAPPEN, YOU NEED:

- Continuous monitoring of CSOs
- Wireless transmission of data
- Near real-time access to data

OR:

- Calibrated collection system model/prediction method capable of estimating CSO volume and duration based on rainfall data
- *A really* dedicated staff to do it all manually!

CSO Notification

24-HOUR CASE STUDY – CHELSEA MA:

- CSO monitoring via flow meters since 2003; reporting just annually
- 2013 permit reissuance included 24-hour notification
- Monitoring equipment replaced entirely:
 - Existing equipment at end of useful life & not wireless
 - Added downstream ultrasonic for measuring tidal influence
 - New wireless telemetry
 - New web-based data management



CSO Notification

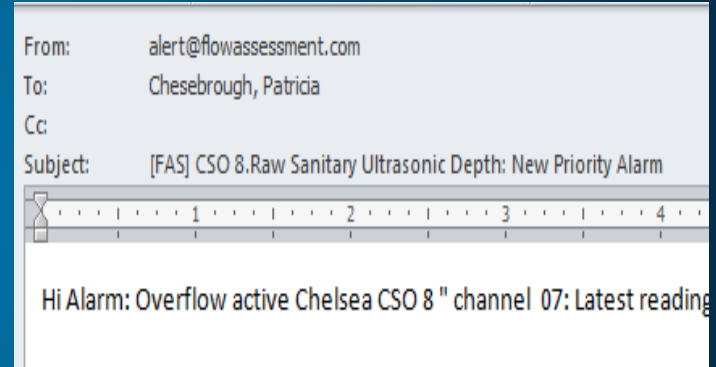
24-HOUR CASE STUDY – CHELSEA MA:

- Written Notification Plan submitted/approved by EPA
 - CSO activation alarms transmitted via email/text to staff
 - Written template for notices
 - Notices provided via email to required/requested stakeholders
- Notification Plan implemented
 - Activation alarm received by staff
 - Staff looks up activation data on website
 - Staff drafts/emails notification within 24 hours of activation

CSO Notification

24-HOUR CASE STUDY – CHELSEA MA:

- What went right:
 - Alarms, alarms, alarms!
 - Access to near real-time data
 - Inclusion of tide data
- What went wrong:
 - False alarm panic
 - 24-hour notifications based on “preliminary” data
 - Inaccurate data sent out to stakeholders in 24-hour notification!



CSO Notification

24-HOUR CASE STUDY – CHELSEA MA:

So...

Meet 24-hour reporting requirements?

or

Send out accurate data?

Hmmm...



CSO Notification

24-HOUR CASE STUDY – CHELSEA MA:

- Consultation with EPA

The City will be required to provide such notification within 24 hours of the onset of such discharges or as soon as feasible after such discharges begin. The City shall develop a plan

- Changes made to notification template

Please note that this notification is based on preliminary metering data, which has been identified as being impacted by tidal conditions. Please do not use the data contained in this notice for official purposes. Final activation data may be obtained from official Discharge Monitoring Reports submitted to the Environmental Protection Agency on a monthly basis, or from the City's CSO Annual Report, which is posted on the City's website.

Lessons Learned

CSO MONITORING:

- Old equipment generally not adequate for new reporting / notification requirements
 - 5-minute recording interval needed; not 15-minute interval
 - Wireless data transmission; not monthly download
 - Access to data within 24 hours, not in monthly / annual report
- CSOs generally not ideal flow metering applications
- Notable learning curve to fully understand particular site behavior

Lessons Learned

CSO NOTIFICATION:

- Numerous approved methods for CSO reporting / notification
- Notable learning curve for staff to understand web data
- Need to understand your specific monitoring & notification trouble spots; address these during permit re-issuance
- Be sure to dissect your permit to identify areas of “flexibility”
- Updated technology is really cool (provides critical / timely data)
- CSO notification is coming ... start planning now

Thank you!

Questions?



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