Albany Pool Combined Sewer System
Long-Term Control Plan Development

Public Information Meeting
January 13, 2011

Joint Venture Team
albany pool
CDM MALCOLM PIRNIE CHA

Albany Cohoes Green Island Rensselaer Troy Watervliet

Public Information Meeting Agenda

- Introductions
  - *Public Participation Plan Overview*
- Long-Term Control Plan Development
  - *Project Review*
  - 2009 Tributary Water Quality Assessment
  - Receiving Water Quality Model
  - Schedule Update / Moving Forward
- Questions and Comments

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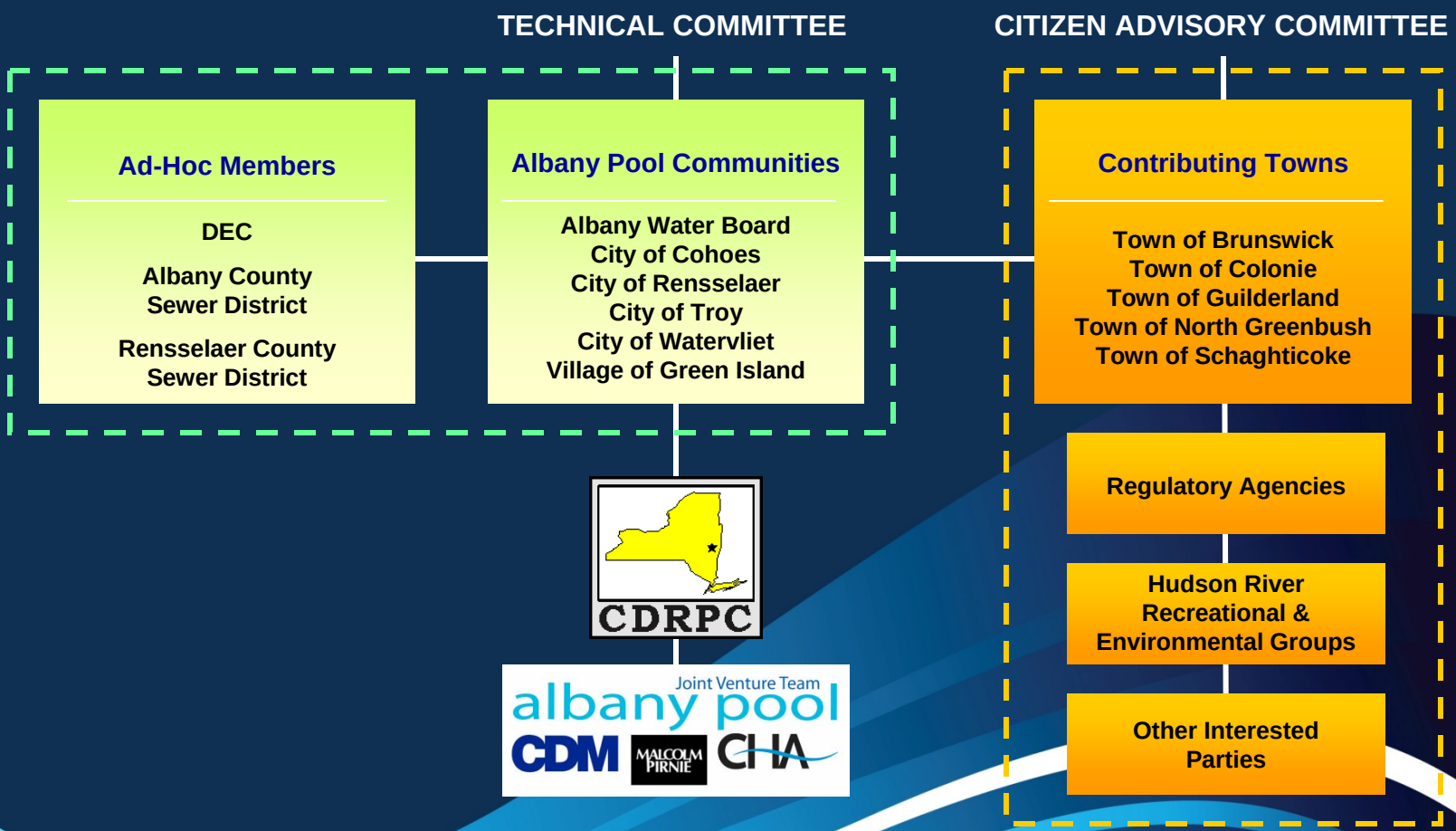
Project Organization Framework



Public Participation Plan

- Target Audiences
  - Albany Pool Communities' Ratepayers/Taxpayers and Residents
  - Elected and Appointed Leadership of Albany Pool Communities
  - Environmental Groups and Recreational Users Associated with the Hudson River
  - Leadership and Residents of Adjoining Communities Contributing Flows to the Albany Pool CSS
  - Riverfront Business Operators

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Public Participation Plan

- Goals and Objectives
  - Provide Albany Pool Municipal Officials with Public Input
  - Establish Early Communication with the Public
  - Encourage Dialogue Between NYSDEC and the Public
  - Solicit Public Concerns During LTCP Development
  - Make Technical Aspects of the Project Clear
  - Build Awareness of Issues Associated with CSOs

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Overview of LTCP Development Process

PUBLIC PARTICIPATION

CSS CHARACTERIZATION

Mapping, Database & Digitizing

Receiving Waters Condition Assessment

CSS Monitoring & Sampling

CSS Modeling

WWTP Wet-Weather Capacity Study

LTCP DEVELOPMENT

Develop & Evaluate CSO Control Alternatives

Funding, Financial Impact & Affordability

Implementation Schedule

Prepare LTCP Report

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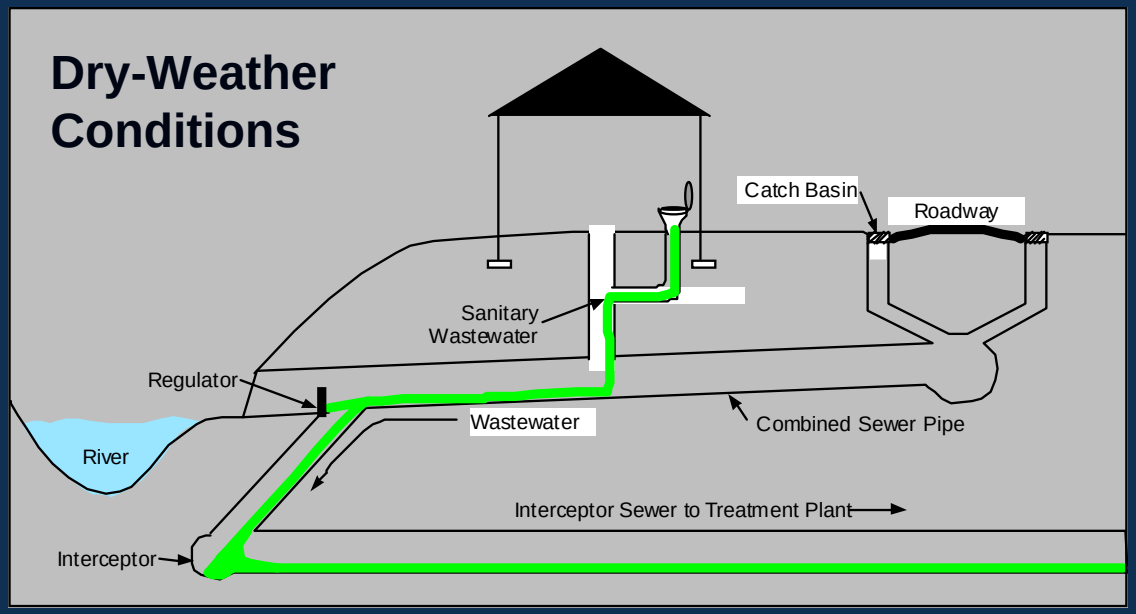
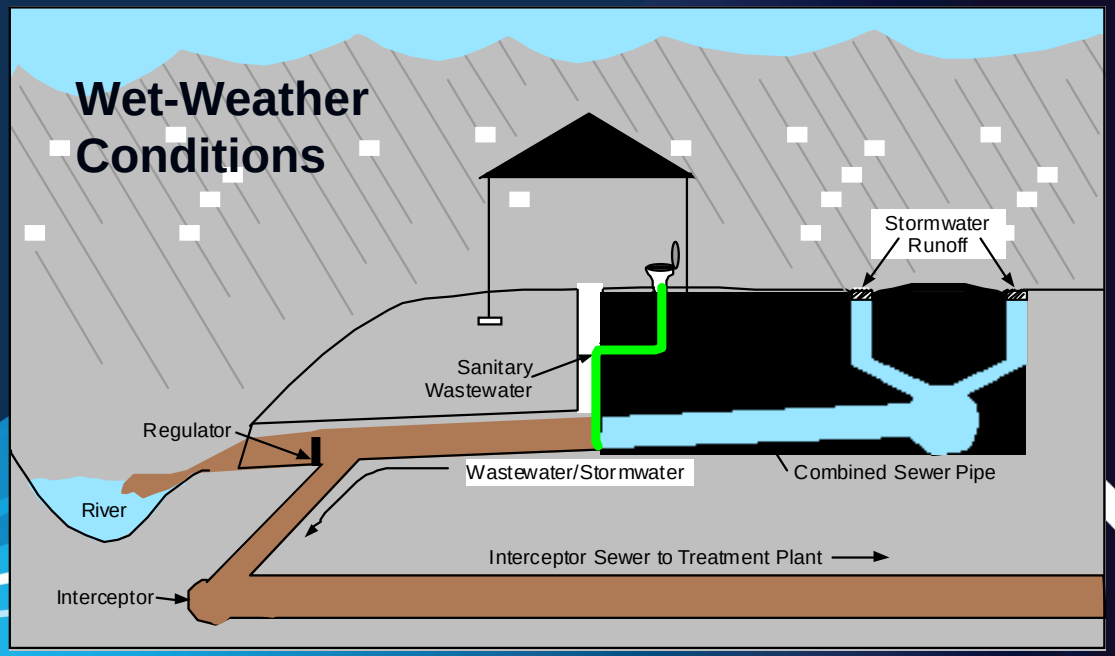
Project Review and Update…

Combined Sewer System Overflows





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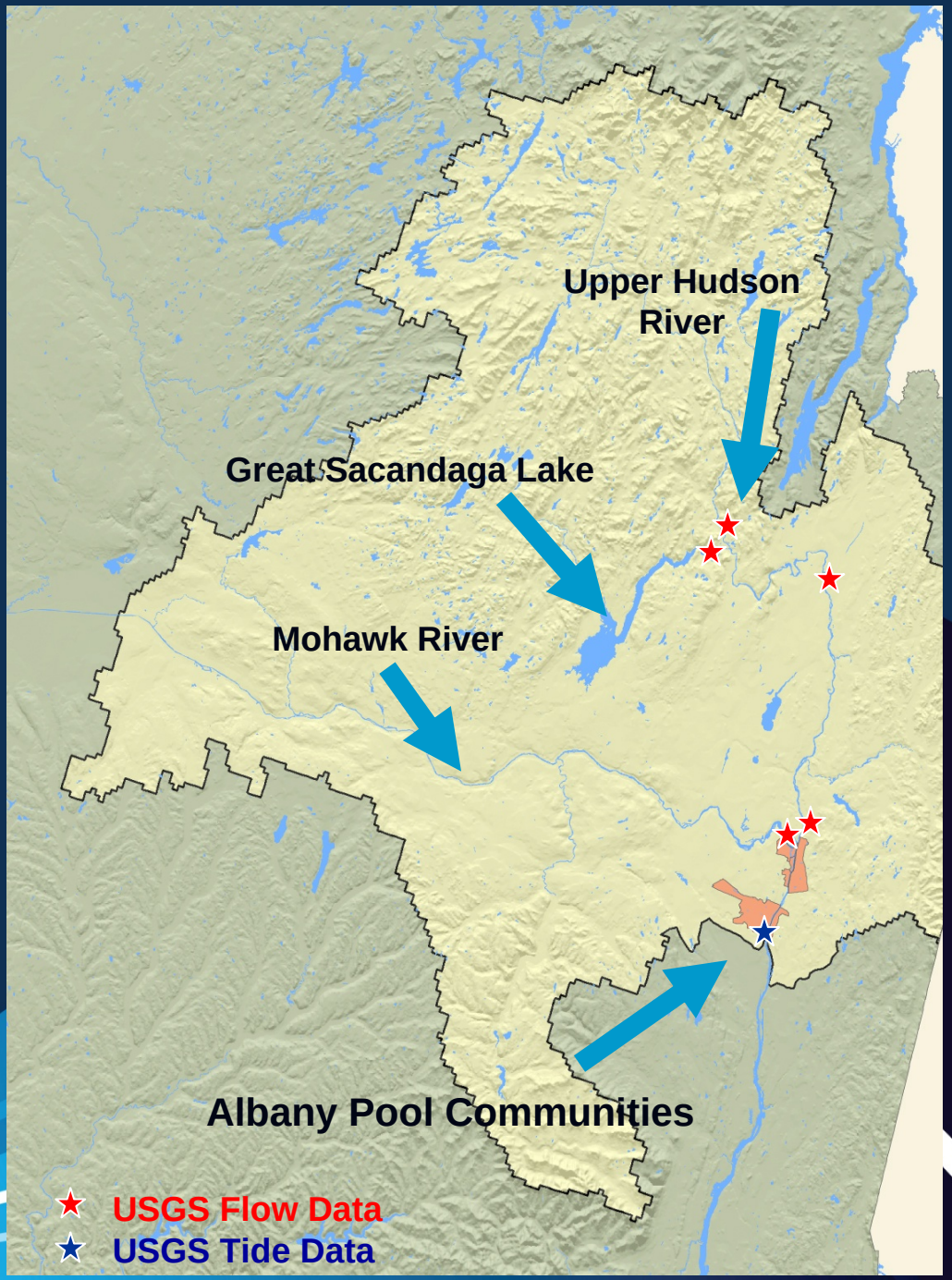
Hydrodynamics of "Albany Pool"

- Watershed
  - 8500 square miles
  - 3500 miles^2 – Mohawk River
- Hydropower
  - 16 Upper Hudson Facilities
  - EJ West at Sacandaga
- Tidal
  - Below Federal Dam
  - 6 foot average range



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Receiving Waters Conditions Assessment

- Most Comprehensive Sampling Program on the Upper Hudson River Performed to Date
  - Dry Weather
  - Wet Weather
- Approximately $1M program
  - $350K for analytical services
  - $280K for WBE field assistance

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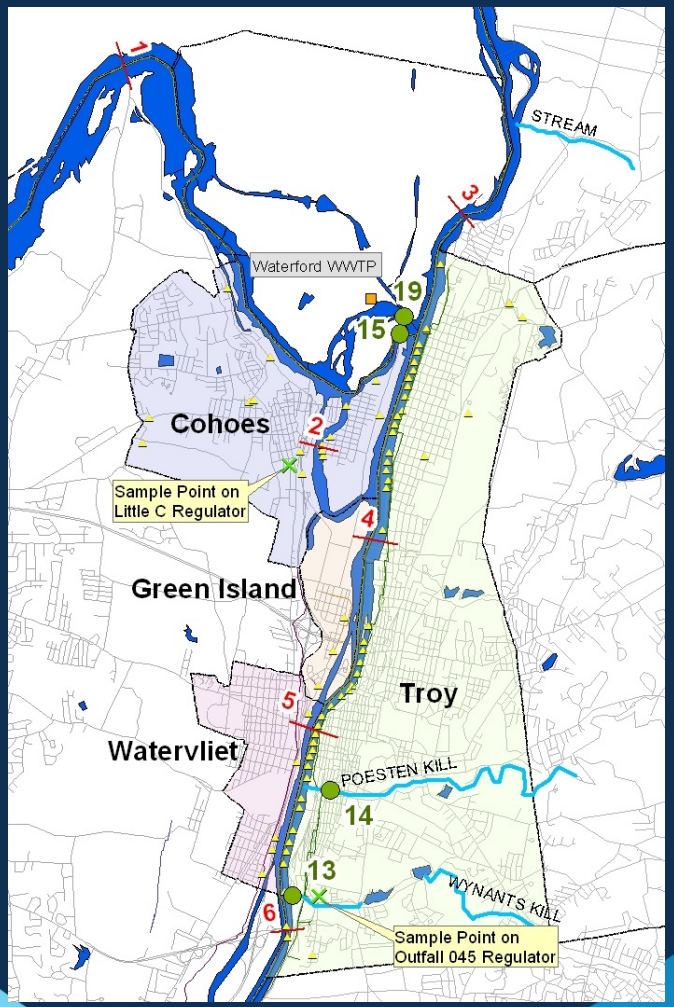
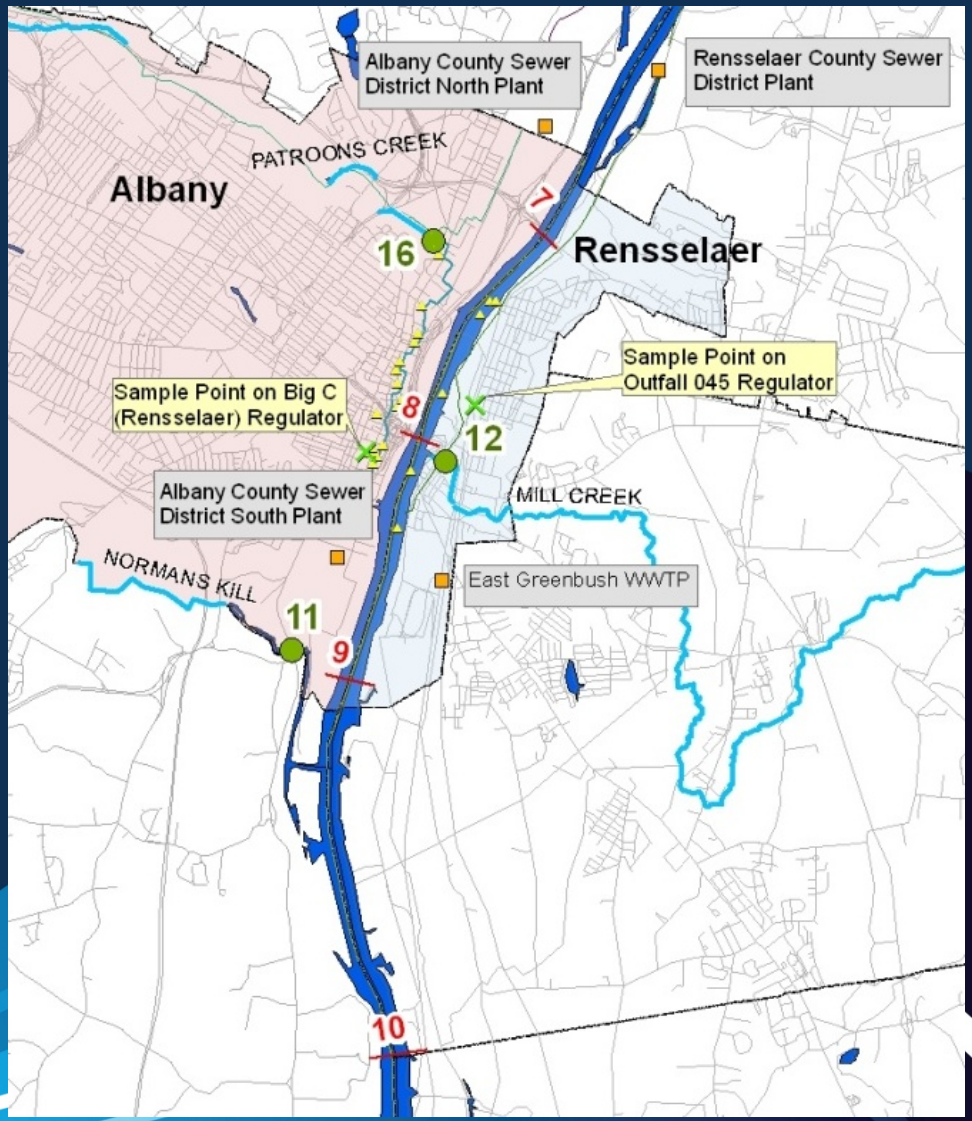
Sampling Locations





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Receiving Waters Condition Assessment

- River is well mixed suitable for 1D Water Quality Model
- Dry Weather Results
  - Hudson and Mohawk are generally in compliance for Fecal Coliform when entering pool
  - Hudson generally out of compliance downstream of WWTPs (Albany Port Area)
  - Tributaries generally exceeded Fecal Compliance Limits
  - Patroon Creek was significantly out of Compliance
  - Potential Downstream Beach sites in Compliance

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Receiving Waters Condition Assessment

- Wet Weather Results
  - Hudson and Mohawk are generally in compliance for Fecal Coliform when entering pool
  - Hudson always out of compliance downstream of WWTPs (Albany Port Area)
  - Tributaries exceed Fecal Compliance Limits
  - Potential Downstream Beach sites in Compliance

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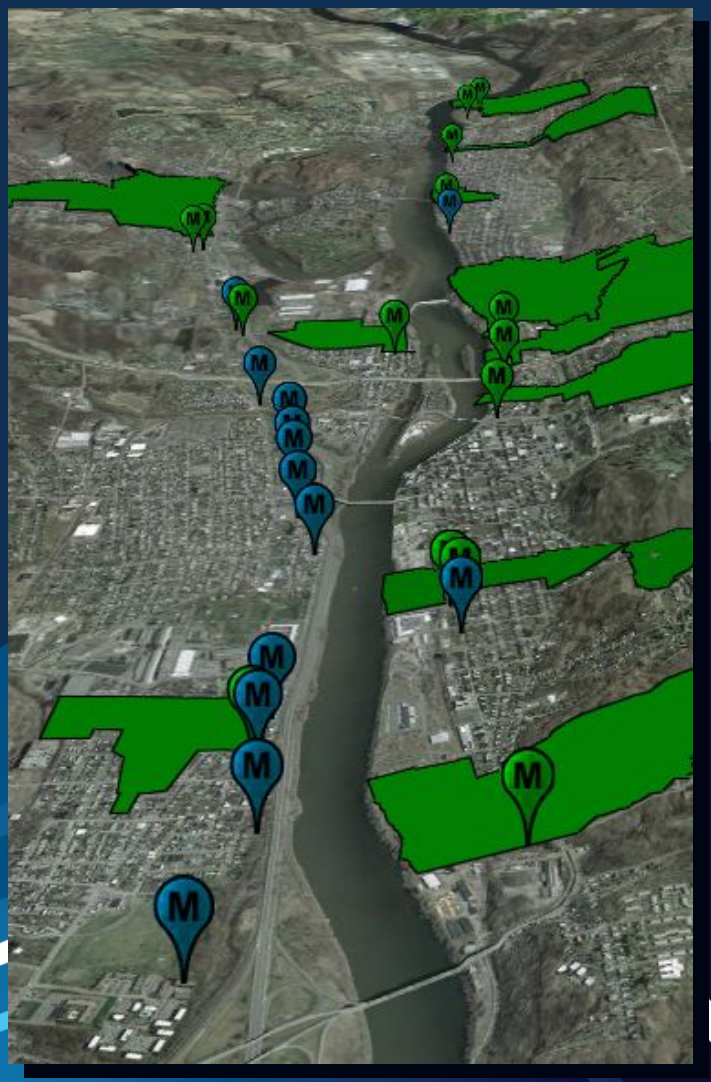
Combined Sewer System Monitoring

- DEC Approved Plan
  - 25 flow meters and 4 rain gages
  - May – August 2008 metering
  - September 2008 Deliverable
- Implemented Plan
  - 45 flow meters and 4 rain gages
  - Additional $176,000 committed
  - June 4 – September 6, 2008
  - Task Completed November 2008



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Combined Sewer System Modeling

- Model Development and Calibration
- Application
  - Existing “Baseline” Conditions
  - Evaluate Control Alternatives
- CSS Modeling Results / Predictions
  - CSO Frequency, Volume and Loads
  - Water Quality Conditions (Inputs into Receiving Waters Model)

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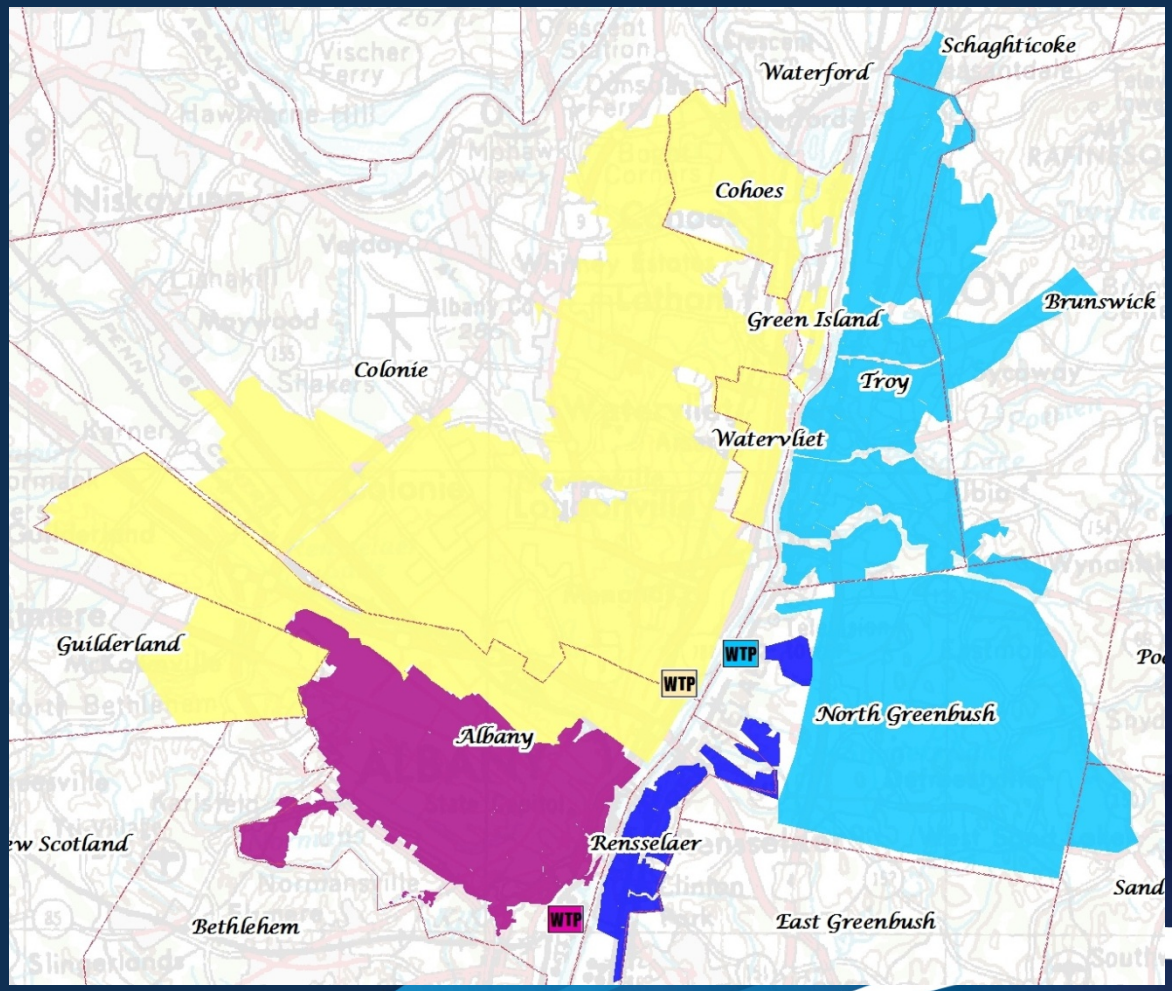
Model Areas

ACSD North

ACSD South



RCSD Troy

RCSD Rensselaer

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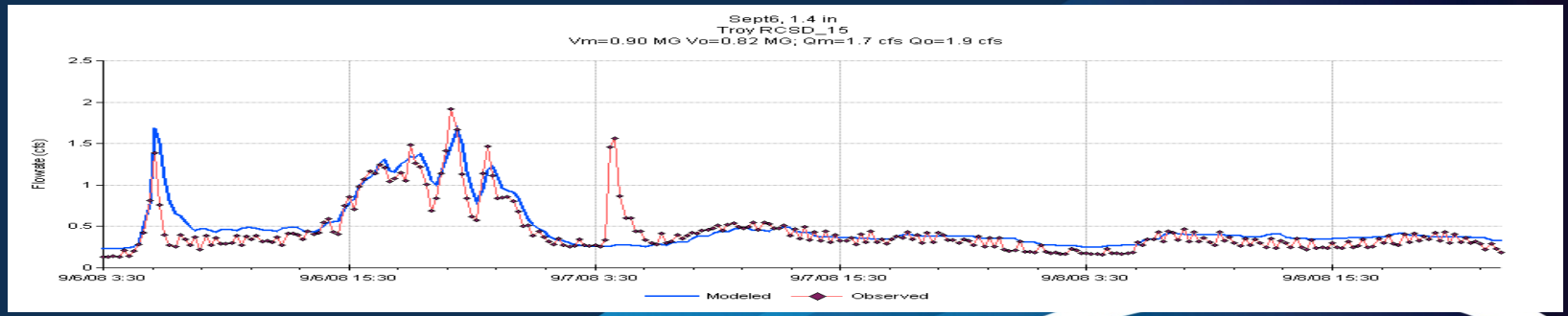
CSS Modeling Overview

- Four Separate Models Developed
  - Albany North, Albany South, Rensselaer, Troy
- Models Calibrated to 2008 Flow and Rainfall Data
- Models Executed for Baseline Conditions
  - Five Year simulation (1985-1989)
- Models to be Utilized to Evaluate CSO Control Benefits



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CSS Baseline Modeling Results

Albany Pool Annual CSO

System	MG/year	Hours	Events	% Capture
Albany North	30	380	61	91
Albany South	775	640	58	63
Rensselaer	20	190	52	88
Troy	448	723	65	67
Total	1,273			

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**** Details of Previous Work Performed are Summarized on CDRPC web-site***

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2009 Tributary Water Quality Assessment

- 2009 Tributary Water Quality Sampling Locations
- Dry Weather Fecal Coliform Data Review
- Wet Weather Fecal Coliform Data Review

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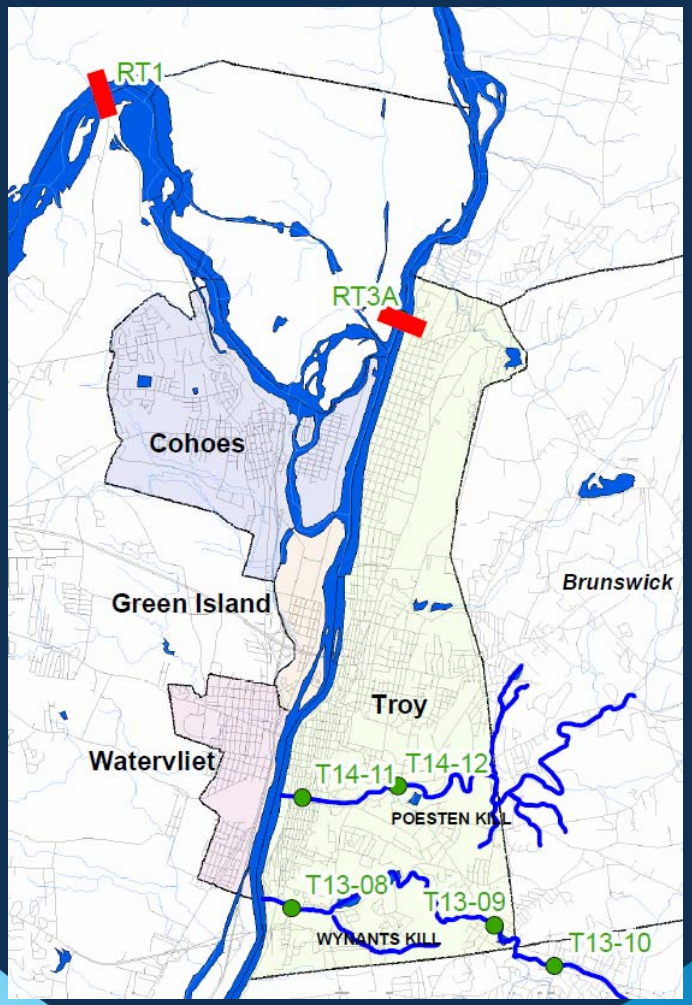
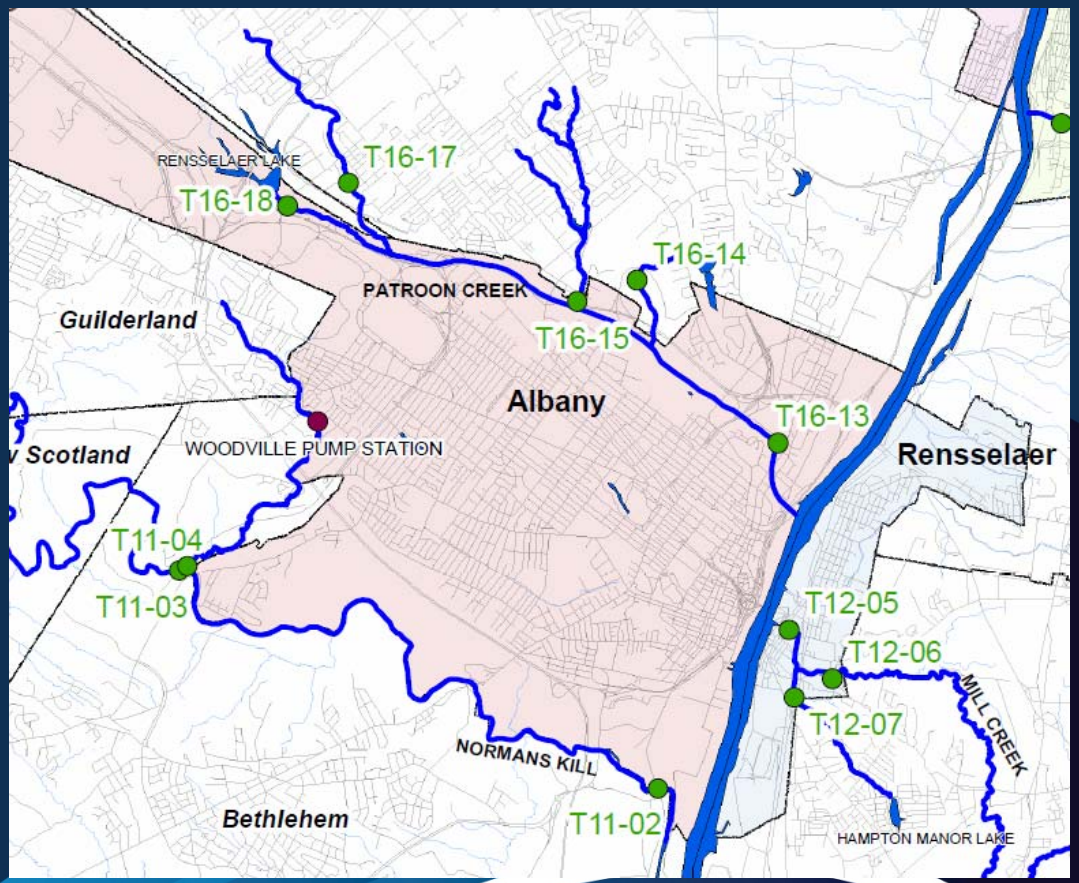
Sampling Locations





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Sampling Locations

- Albany County
  - Normans Kill
    - Assess contributions from the Town of Bethlehem
  - Patroon Creek
    - Assess contributions from the Town of Colonie

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Sampling Locations

- Rensselaer County
  - Mill Creek
    - Assess contributions from the Town of East Greenbush
  - Wynants Kill
    - Assess contributions from the Town of North Greenbush
  - Poesten Kill
    - Assess Contributions from the Town of Brunswick

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Dry Weather Sampling

- 5 events preceded by 72 hours of dry weather
- 1 sample circuit of 22 locations per event
  - 2 river transects (6 locations)
  - 16 tributary locations
- Fecal Coliform, pH, Conductivity, Temperature, Dissolved Oxygen, BOD, Ammonia Nitrogen, Total Phosphorus
  - *Fecal Coliform samples at tributary locations only

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Bacteria Standards

- NYS Standard for Class A, B and C Waters for Fecal Coliform
  - Geometric Mean of 5 samples < 200 cfu/100ml

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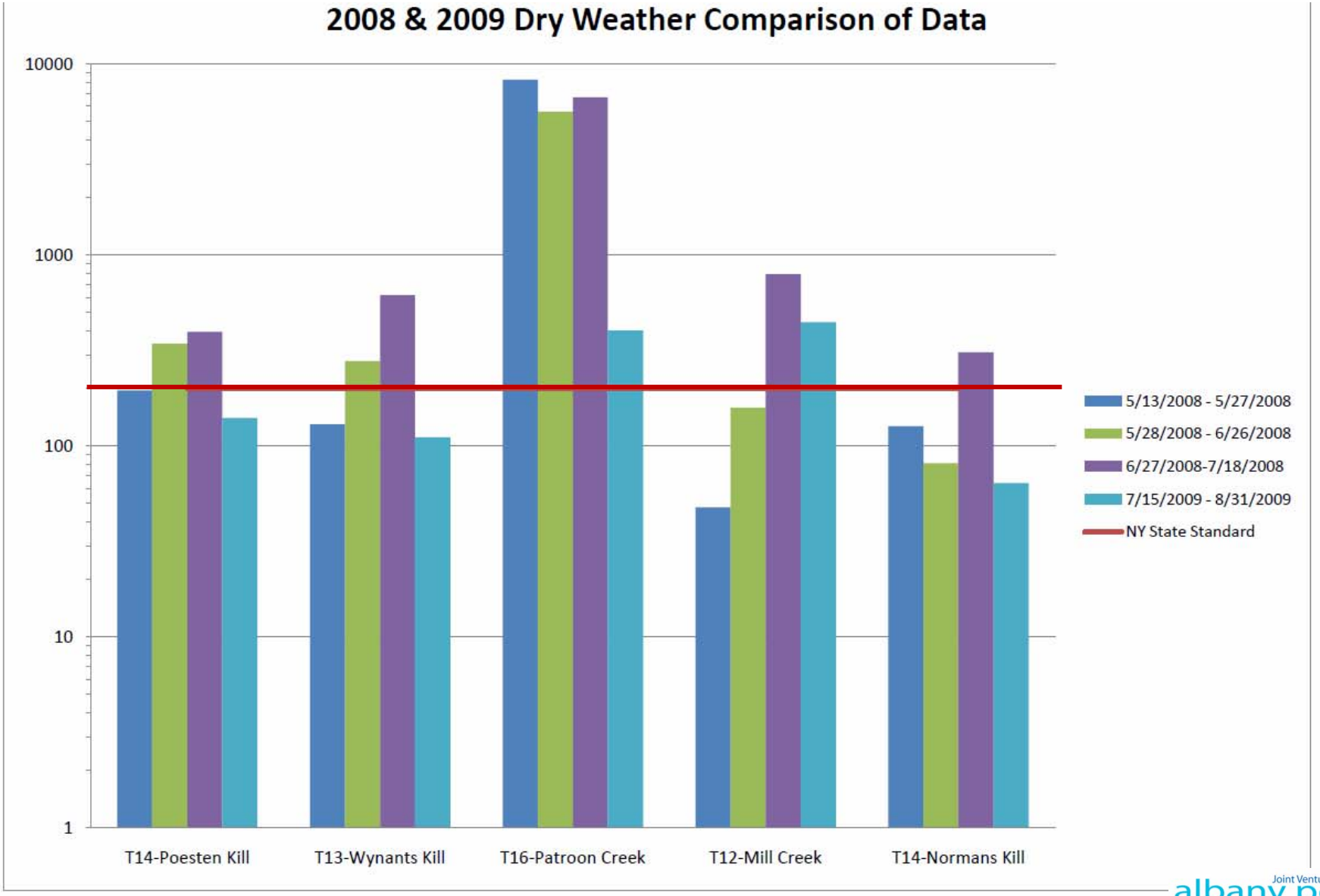
Dry Weather Results - Bacteria



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Dry Weather Results - Bacteria

Tributary	Sampling Location	ID #	Geometric Mean	Direction of Flow	Upstream Community
Normans Kill	Krum Kill, NYS Route 85	T11-04	379	↓	*Border
	NYS Route 85	T11-03	206		Bethlehem
	River Rd. (2008)	**T11-02**	64		*Border
Mill Creek	South St.	T12-07	202	↓	East Greenbush
	High St.	T12-06	368		East Greenbush
	Washington Ave. (2008)	**T12-05**	444		Rensselaer
Wynants Kill	Brookside Ave.	T13-10	60	↓	North Greenbush
	Winter St.	T13-09	117		North Greenbush
	Burden Ave. (2008)	**T13-08**	111		Troy
Poesten Kill	Pawling Ave.	T14-12	129	↓	Brunswick
	2nd St. (2008)	**T14-11**	140		Troy
Patroon Creek	Fuller Rd.	T16-18	997	↓	Albany
	Palma Park	T16-17	95		Colonie
	Sand Creek	T16-15	307		Colonie
	Corporate Park Blvd.	T16-14	150		Colonie
	Tivoli St. (2008)	**T16-13**	402		Albany

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Dry Weather Bacteria Summary

- Wynants Kill and Poesten Kill sampling locations are in compliance
  - Flows from North Greenbush and Brunswick are in compliance
  - Krum Kill and upstream Normans Kill exceed WQS for fecal coliform
  - Flows from Bethlehem marginally exceed WQS for fecal coliform
- Normans Kill at the Hudson River is in compliance
- Mill Creek sampling locations exceed the fecal coliform compliance limit
  - Flows from East Greenbush exceed WQS for fecal coliform

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Dry Weather Bacteria Summary, Continued

- Patroon Creek sampling locations exceed WQS for Fecal Coliform
  - Fuller Road sampling location significantly exceeds WQS for fecal coliform
  - Sampling locations within the Town of Colonie near Palma Park and Corporate Woods Blvd meet WQS for fecal coliform
  - Sand Creek sampling location exceeds WQS for fecal coliform
  - Rensselaer Lake samples meet WQS for fecal coliform for all samples
  - Patroon Creek at Hudson River exceeds WQS for fecal coliform but show significant improvement since 2008 sampling

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Wet Weather Sampling

- 3 events preceded by 72 hours dry weather
- Community-wide storm event
- Sampling Duration of 48 hours
- 10 sample circuits of 22 locations per event
  - 2 river transects (6 locations)
  - 16 tributary locations
- Same parameters as dry weather

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Wet Weather Results - Bacteria

Tributary	Sampling Location	ID #	Wet Event No.			Dry Weather	Direction of Flow	Upstream Community
			1	2	3			
Normans Kill	Krum Kill, NYS Route 85	T11-04	10249	955	7649	379	↓	*Border
	NYS Route 85	T11-03	1503	169	870	206		Bethlehem
	River Rd. (2008)	**T11-02**	1554	249	844	64		*Border
Mill Creek	South St.	T12-07	1157	333	1641	202	↓	East Greenbush
	High St.	T12-06	2105	717	2422	368		East Greenbush
	Washington Ave. (2008)	**T12-05**	2983	976	2006	444		Rensselaer
Wynants Kill	Brookside Ave.	T13-10	680	232	755	60	↓	North Greenbush
	Winter St.	T13-09	654	333	862	117		North Greenbush
	Burden Ave. (2008)	**T13-08**	1008	214	975	111		Troy
Poesten Kill	Pawling Ave.	T14-12	363	179	786	129	↓	Brunswick
	2nd St. (2008)	**T14-11**	495	265	892	140		Troy
Patroon Creek	Fuller Rd.	T16-18	3205	2699	872	997	↓	Albany
	Palma Park	T16-17	5019	639	3150	95		Colonie
	Sand Creek	T16-15	2237	1179	2656	307		Colonie
	Corporate Park Blvd.	T16-14	1004	350	3129	150		Colonie
	Tivoli St. (2008)	**T16-13**	4166	682	4276	402		Albany
Cumulative Precipitation @ Albany Airport (IN)			1.12	0.34	1.19			

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Wet Weather Summary - Bacteria

- Larger storms generally result in greater fecal counts
- All tributary sampling locations generally exceed the fecal coliform compliance limit
- All inflows from neighboring communities exceed WQS for fecal coliform
- Sample locations within the Normans Kill show similar results along its length
- Fecal counts in the Krum Kill are significantly greater than downstream Normans Kill values

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Wet Weather Bacteria Summary, Continued

- Geometric mean counts for Wynants Kill and Poesten Kill show consistent values from upstream to downstream
- The sampling locations contributing to and within Patroon Creek show consistently high counts
- Patroon Creek at Hudson River shows significant improvement from 2008
- Geometric mean counts for Mill Creek show a slight increase from upstream to downstream.

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  - Schedule Update / Moving Forward
- Questions and Comments

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Parameters of Concern (NYS ECL 703)

- Dissolved Oxygen
  - Minimum daily average not less than 5 mg/l
  - Never less than 4 mg/l
- Fecal Coliform Bacteria
  - Monthly geometric mean for fecal less than 200 / 100 ml
  - Standards must be met during all periods when disinfection required for SPDES-permitted discharges
- Floatables
  - No residue attributable to sewage… nor visible oil film nor globules of grease

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Evaluation Tools

- Sewer Models (EPA SWMM)
- River Models
  - Bacteria and hydraulics (EPA SWMM)
  - Dissolved oxygen (EPA WASP)

Albany North

Albany South

Troy

Rensselaer

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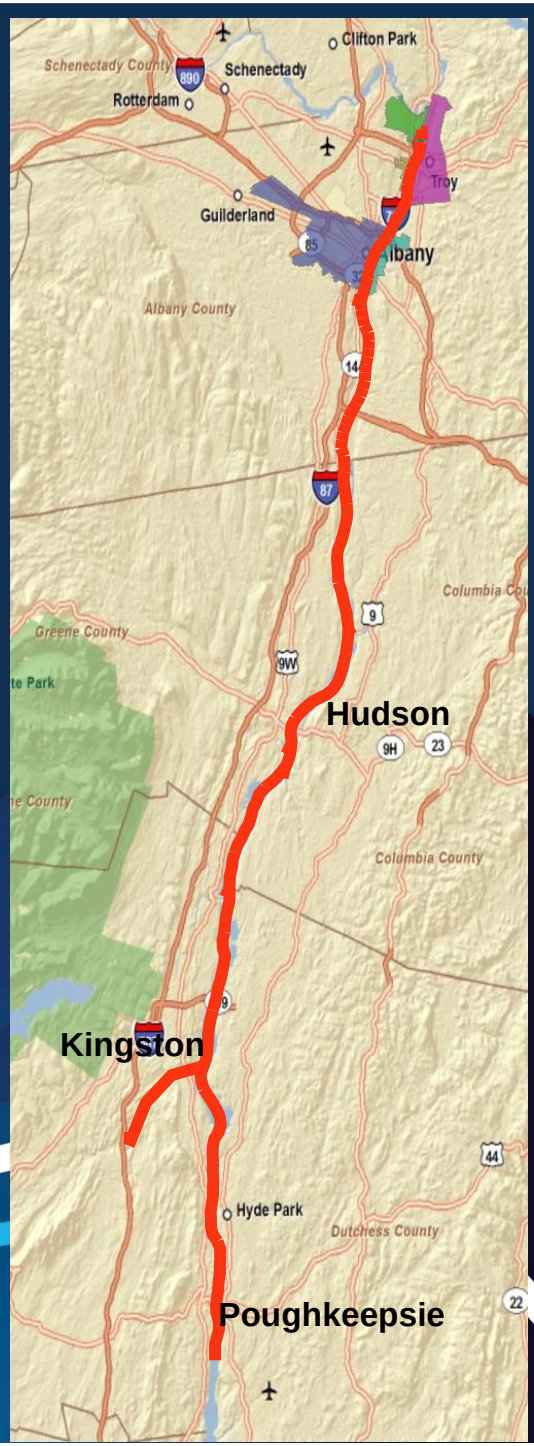
Water Quality Model Development

- Limits
- Segmentation
- Physical characterization
- Inflow points
- Bacteria source concentrations
- BOD and DO source concentrations



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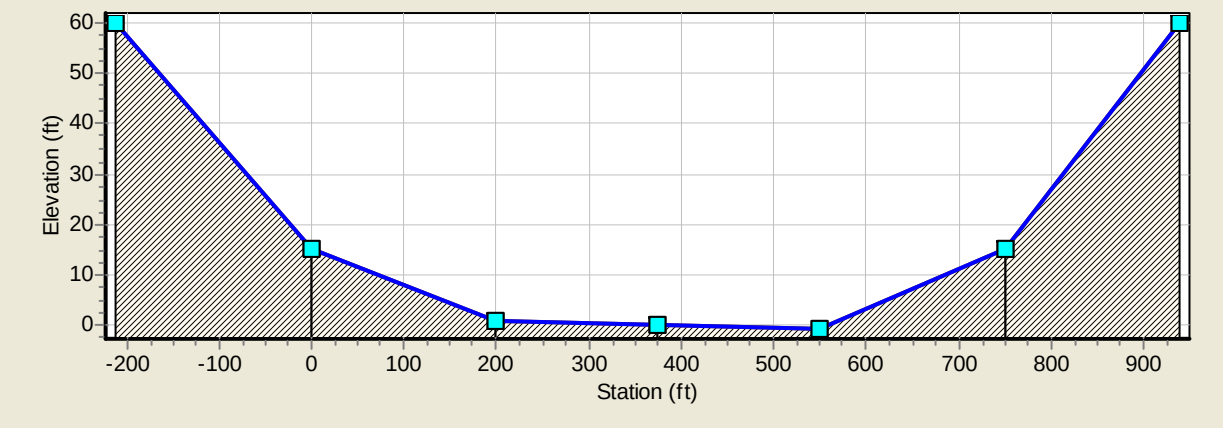
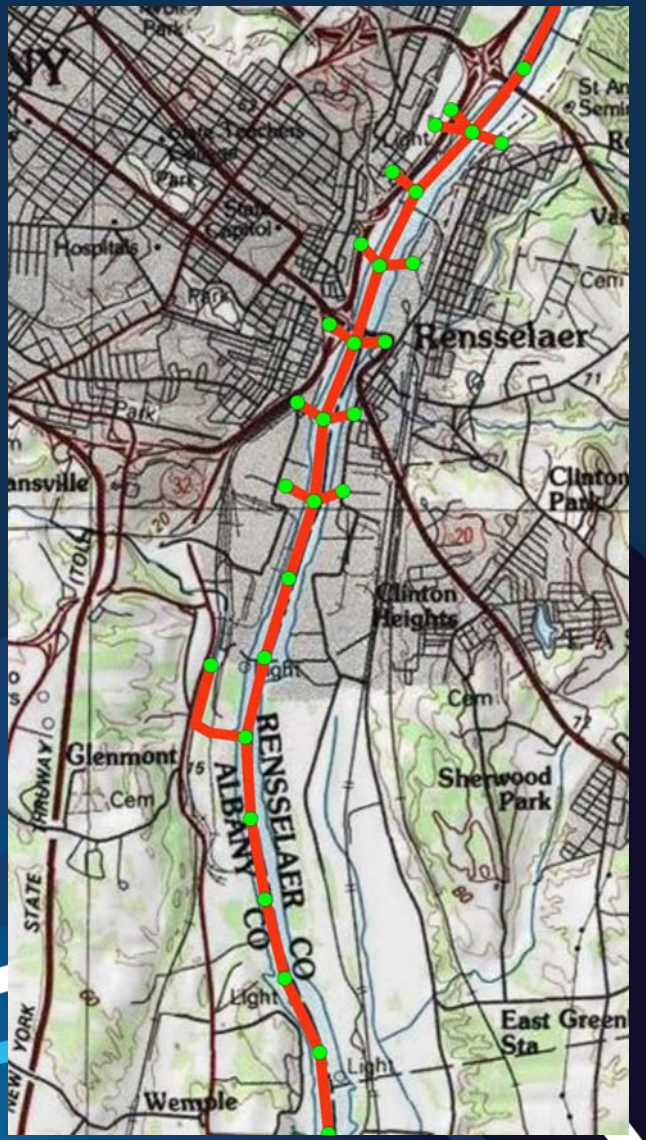
Hudson River Models

- Mohawk confluence to Poughkeepsie
- Half-mile segments in Model





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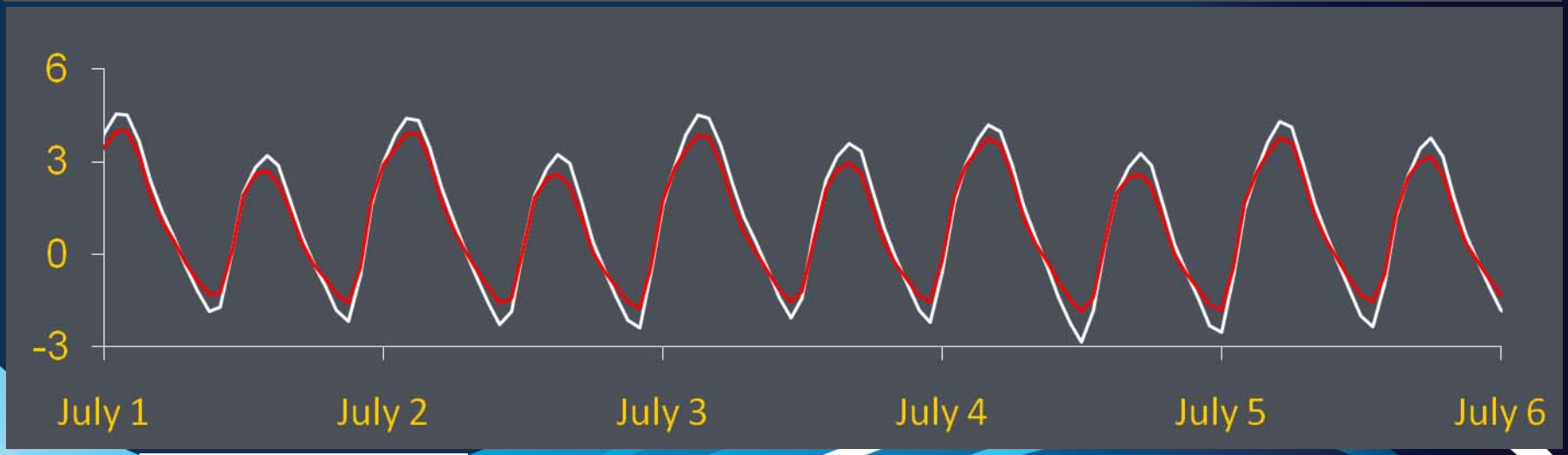
2008 Albany Stage Calibration



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Wet and Dry Weather Baseline Bacteria Concentration Inputs

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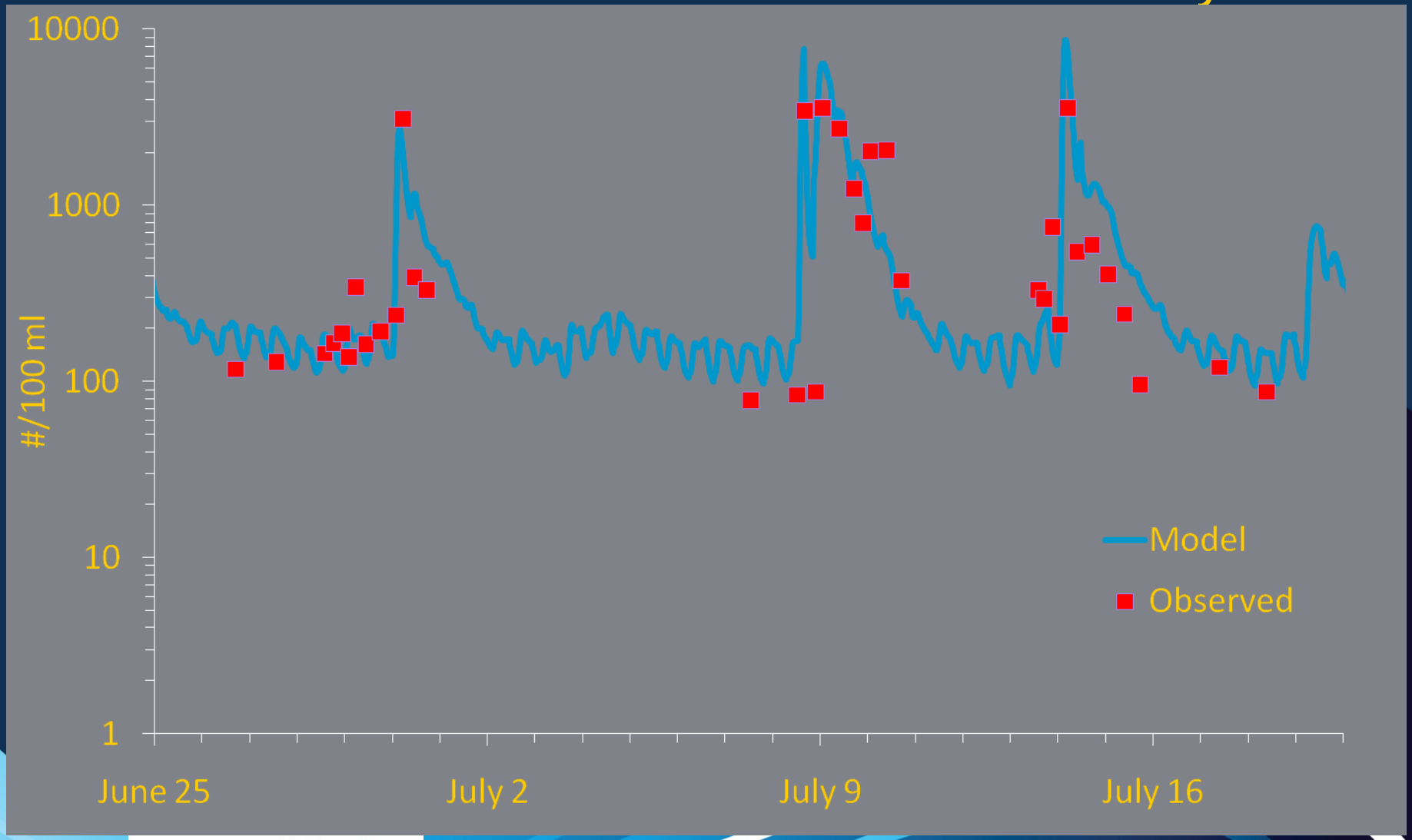
Model Validation at RT9 – Port of Albany



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Bacteria Modeling Results

Scenario	WWTP Disinfection	Headwaters	Tributaries	CSO	Exceedances (months/30 months)
Baseline	No	Baseline	Baseline	Baseline	30
1	Yes	Baseline	Baseline	Baseline	2
2	Yes	Improved	Improved	Baseline	0
2A	Yes	Improved	Baseline; Patroon Creek improved to 2009 levels	Baseline	0
3	Yes	Baseline	Baseline	85% Capture	2
4	No	Baseline	Baseline	85% Capture	30

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Baseline refers to 2008 calibrated conditions

DO Model Baseline Conclusions

- Albany Pool CSO contributions to DO depletion minimal compared to loads from WWTPs, headwaters and tributaries
- Low DO at Henry Hudson Park and Schodack Island not associated with CSO
- CSO has negligible impact on river DO

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Bacteria Model Observations

- Hudson River has large assimilative capacity shown by the steady decline in frequency of bacteria exceedances as flow passes downstream
- Seasonal disinfection of WWTPs significantly reduces frequency of bacteria exceedances at all river transects
- Bacteria contributed by headwaters and tributaries greatly influences frequency of bacteria exceedances in the river

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RWQ Modeling Conclusions

- CSOs do not preclude the Hudson River attaining water quality standards
- Bacteria standard is expected to be met upon implementation of WWTP seasonal disinfection and improvements to headwaters of the Hudson River and Patroon Creek
- Improvements to Hudson River continuous bacteria loads provide more effective bacteria-based water quality improvements than improvements to intermittent, wet weather-based CSO discharges
- Consider Demonstrative Approach for evaluating CSO controls
- CSO alternatives analysis will focus on:
  - Best management practices (BMPs), system optimization, WWTP disinfection and Floatables control

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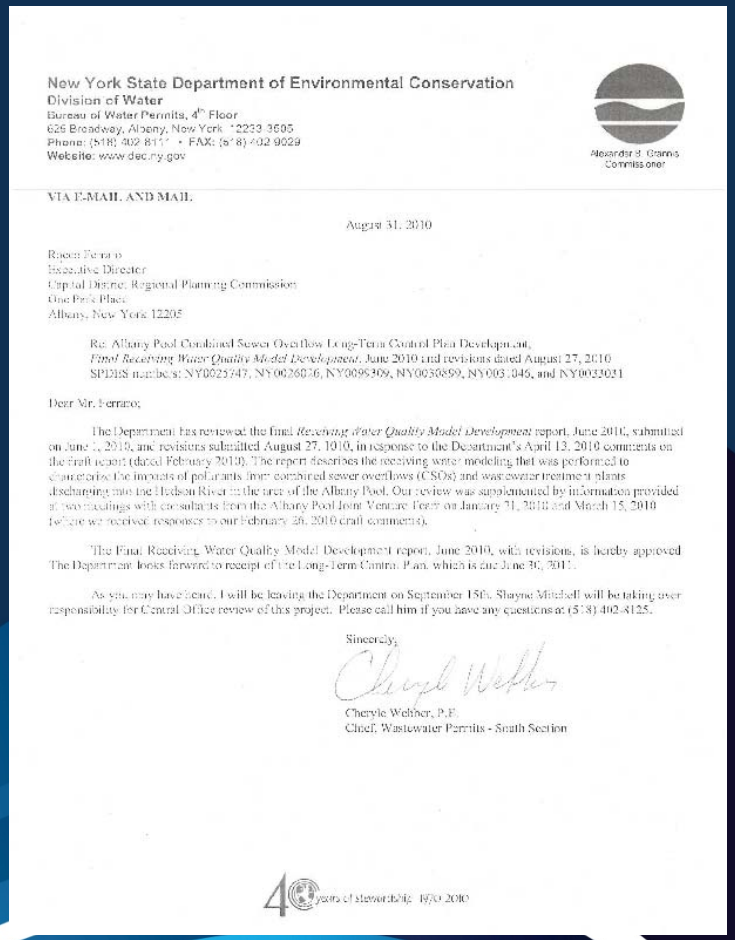
Regulatory Update

- WQ Model Development Report approved August 31, 2010 after extensive review and comment
- LTCP submission deadline extended to June 30, 2011



New York State Department of Environmental Conservation
Division of Water
Bureau of Water Permits, 4th Floor
625 Broadway, Albany, New York 12233-3505
Phone: (518) 402-8111 • FAX: (518) 402-9029
Website: www.dec.ny.gov

Alexander B. Grannis
Commissioner

VIA E-MAIL AND MAIL

August 31, 2010

Rocco Ferraro
Executive Director
Capital District Regional Planning Commission
One Park Place
Albany, New York 12205

Re: Albany Pool Combined Sewer Overflow Long-Term Control Plan Development,
Final Receiving Water Quality Model Development, June 2010 and revisions dated August 27, 2010
SPDES numbers: NY0025747, NY0026076, NY0095309, NY0030759, NY0033045, and NY0033021

Dear Mr. Ferraro:

The Department has reviewed the final *Receiving Water Quality Model Development* report, June 2010, submitted on June 1, 2010, and revisions submitted August 27, 1010, in response to the Department's April 13, 2010 comments on the draft report (dated February 2010). The report describes the receiving water modeling that was performed to characterize the impacts of pollutants from combined sewer overflows (CSOs) and wastewater treatment plants discharging into the Hudson River in the area of the Albany Pool. Our review was supplemented by information provided at two meetings with consultants from the Albany Pool Joint Venture Team on January 21, 2010 and March 15, 2010 before we received responses to our February 26, 2010 draft comments).

The Final Receiving Water Quality Model Development report, June 2010, with revisions, is hereby approved. The Department looks forward to receipt of the Long-Term Control Plan, which is due June 30, 2011.

As you may have heard, I will be leaving the Department on September 15th. Shayne Mitchell will be taking over responsibility for Central Office review of this project. Please call him if you have any questions at (518) 402-8125.

Sincerely,

Cheryle Webber, P.E.
Chief, Wastewater Permits - South Section

40 years of stewardship 1970-2010

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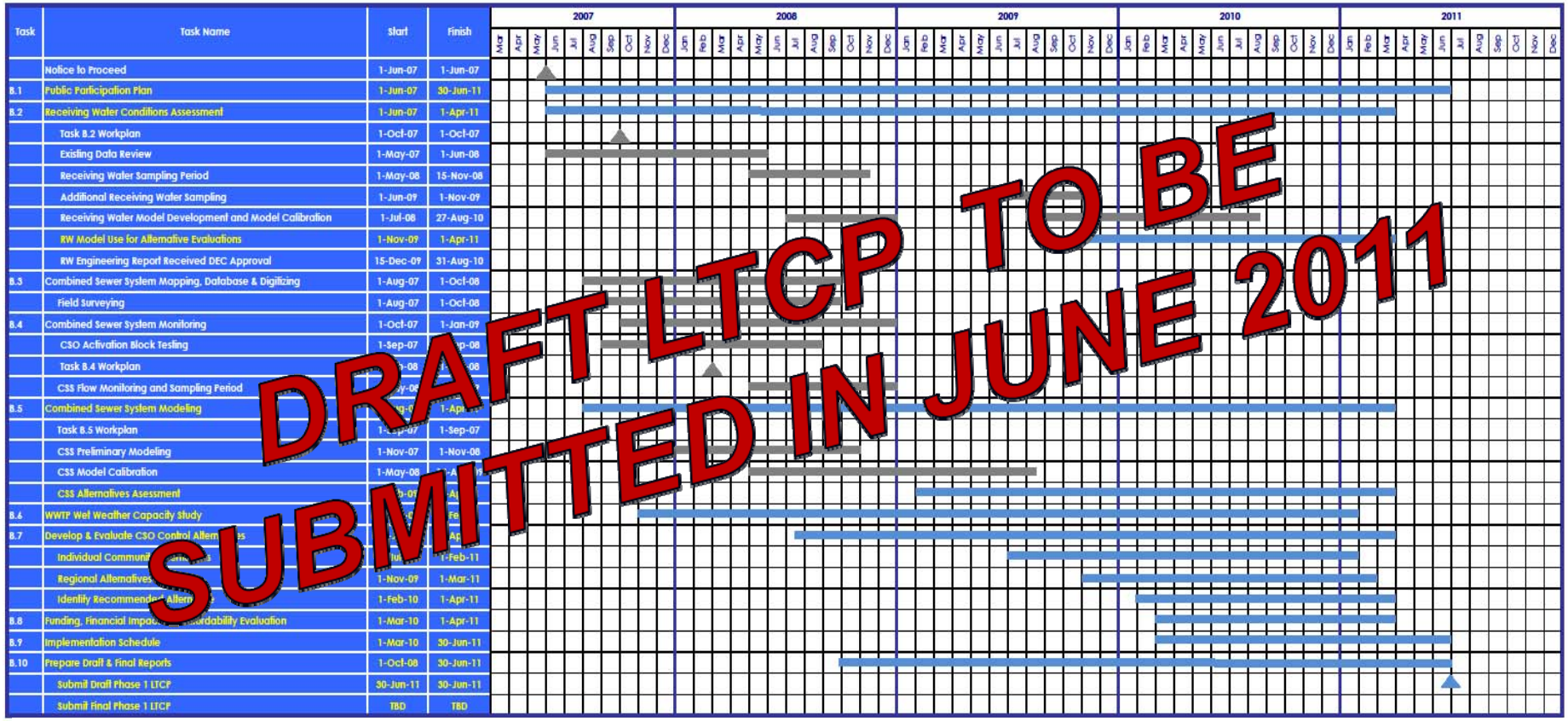
Albany Pool CSO LTCP Development
Updated Project Schedule
November 2010



Task	Task Name	Start	Finish
	Notice to Proceed	1-Jun-07	1-Jun-07
B.1	Public Participation Plan	1-Jun-07	30-Jun-11
B.2	Receiving Water Conditions Assessment	1-Jun-07	1-Apr-11
	Task B.2 Workplan	1-Oct-07	1-Oct-07
	Existing Data Review	1-May-07	1-Jun-08
	Receiving Water Sampling Period	1-May-08	15-Nov-08
	Additional Receiving Water Sampling	1-Jun-09	1-Nov-09
	Receiving Water Model Development and Model Calibration	1-Jul-08	27-Aug-10
	RW Model Use for Alternative Evaluations	1-Nov-09	1-Apr-11
	RW Engineering Report Received DEC Approval	15-Dec-09	31-Aug-10
B.3	Combined Sewer System Mapping, Database & Digitizing	1-Aug-07	1-Oct-08
	Field Surveying	1-Aug-07	1-Oct-08
B.4	Combined Sewer System Monitoring	1-Oct-07	1-Jan-09
	CSO Activation Block Testing	1-Sep-07	[illegible]
	Task B.4 Workplan	[illegible]	[illegible]
	CSS Flow Monitoring and Sampling Period	[illegible]	[illegible]
B.5	Combined Sewer System Modeling	[illegible]	[illegible]
	Task B.5 Workplan	[illegible]	1-Sep-07
	CSS Preliminary Modeling	1-Nov-07	1-Nov-08
	CSS Model Calibration	1-May-08	[illegible]
	CSS Alternatives Asessment	[illegible]	[illegible]
B.6	WWTP Wet Weather Capacity Study	[illegible]	[illegible]
B.7	Develop & Evaluate CSO Control Alternatives	[illegible]	[illegible]
	Individual Communities	[illegible]	1-Feb-11
	Regional Alternatives	1-Nov-09	1-Mar-11
	Identify Recommended Alternative	1-Feb-10	1-Apr-11
B.8	Funding, Financial Impact & Affordability Evaluation	1-Mar-10	1-Apr-11
B.9	Implementation Schedule	1-Mar-10	30-Jun-11
B.10	Prepare Draft & Final Reports	1-Oct-08	30-Jun-11
	Submit Draft Phase 1 LTCP	30-Jun-11	30-Jun-11
	Submit Final Phase 1 LTCP	TBD	TBD

- **Request for Schedule Extension (Approved)**
  - **Additional CSS Monitoring Locations**
  - **Additional Tributary Sampling (2009)**
  - **Expanded Receiving Waters Modeling**

CSO LTCP Goals

- Maintain current Class C river uses
  - Fishing and fish habitat
  - Recreational boating
  - Other primary and secondary contact activities
- Accommodate swimming and bathing at future beach sites during May 1 to October 30 recreational season
- Support riverfront economic development

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Recommended CSO Control Strategy

- Use Demonstrative Approach – build and measure
- Tiered approach to CSO control recommendations
  - Tier 1 – Projects completed to-date and those that must be completed to achieve SPDES permit and CSO Policy compliance
  - Tier 2 – BMPs and other improvements that communities and sewer districts plan to implement to further control CSOs

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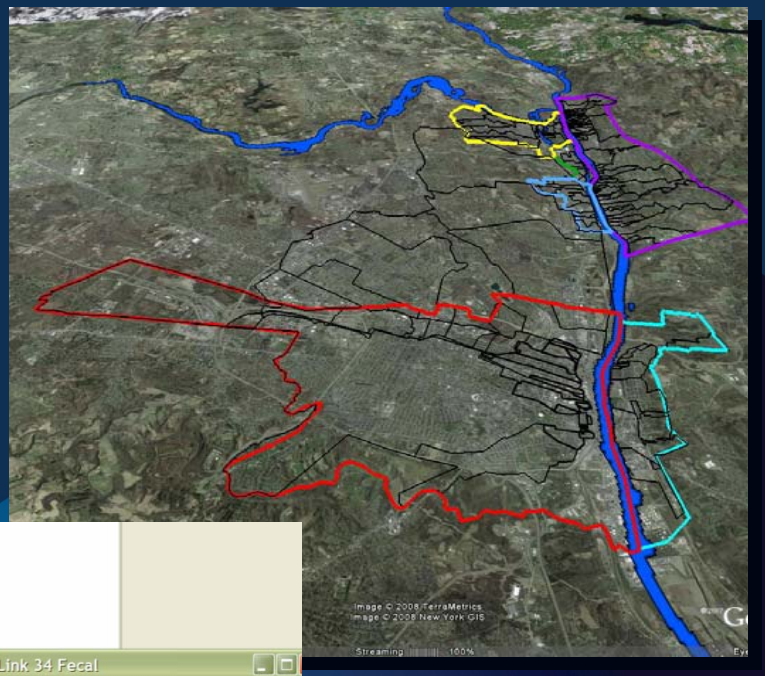
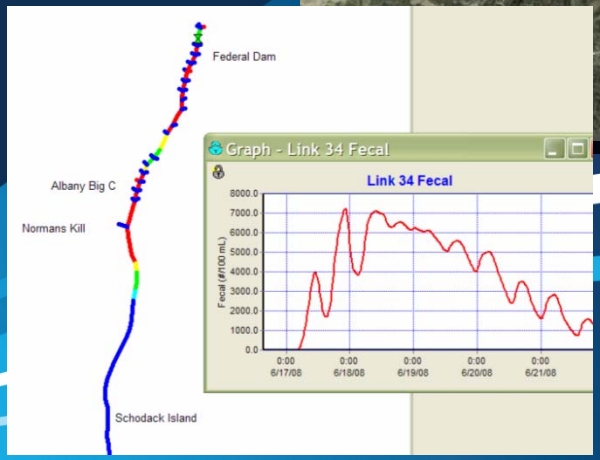
Moving Forward…

- Ongoing LTCP Activities
  - Finalizing WWTP Evaluations
  - Control Activities Development
    - Local
    - East Side/West Side
    - Regional
  - Funding, Financial Impact & Affordability
  - Implementation Schedule
  - Preparation of the LTCP Report
- Public Participation
  - Ongoing CAC/Public meetings





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Moving Forward…

Public Information Meeting Schedule

- Round 1 - Project Introduction and Overview
  HVCC March 31, 2008
- Round 2 - CSS Characterization Findings Overview
  November 10, 2009
- Round 3 – Receiving Waters Sampling and Modeling
  January 13, 2011
- ***Round 4 - LTCP CSO Controls Presentation***
  Spring 2011

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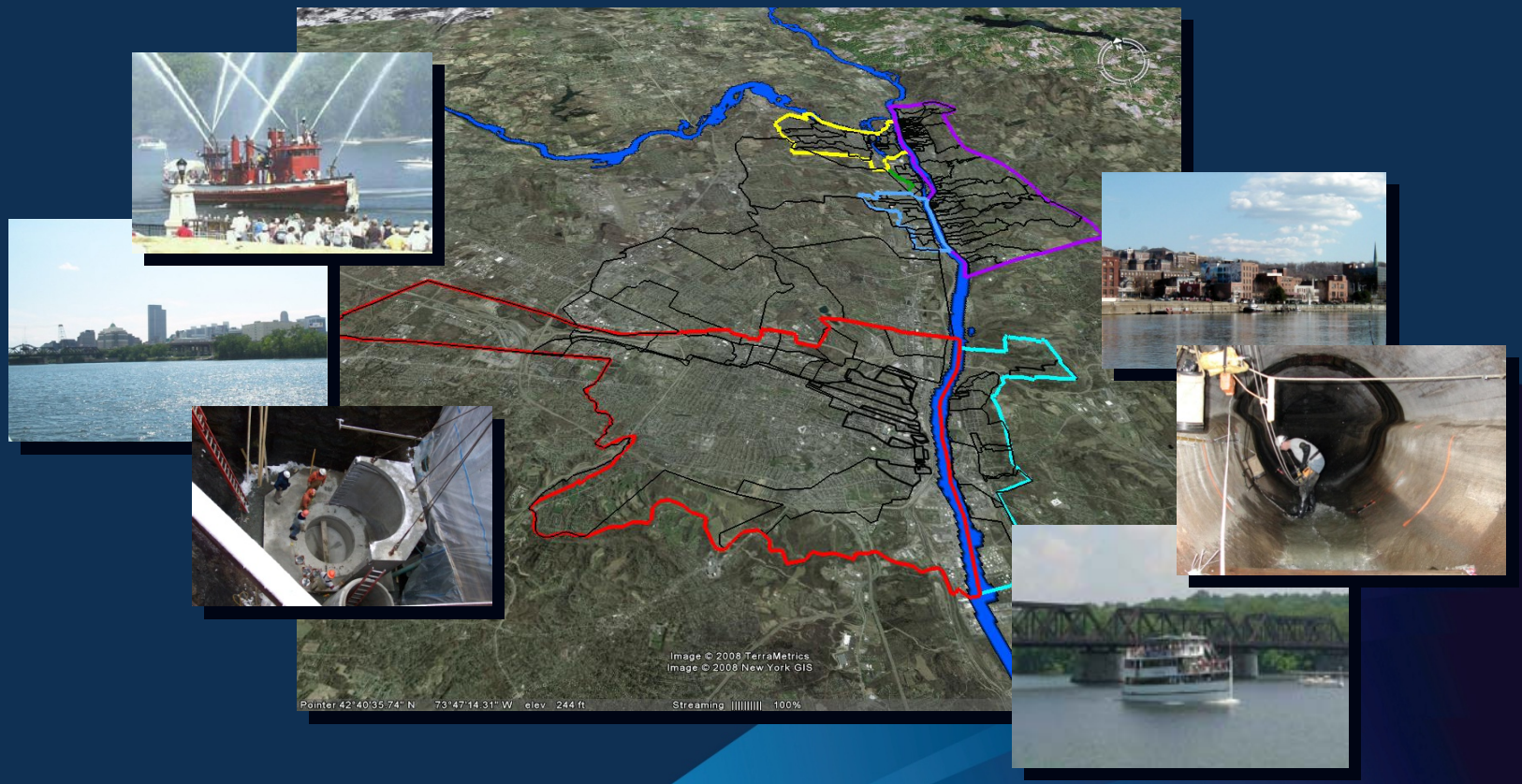
Albany Pool Combined Sewer System
Long-Term Control Plan Development



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Questions or Comments

Extra Slides

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Measured Field Parameters

- Hand held probe used to capture:
  - Temperature
  - pH
  - Conductivity
  - Dissolved Oxygen

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Field Parameter Summary

- Tributary and upstream river transects monitored
- Data is consistent with what was observed in 2008
- Temperature, Conductivity, pH in typical ranges
- All Dry weather DO values are greater than 5 mg/l.

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Field Parameter Tributary Summary

- Wet weather DO values along the Normans Kill and Patroon Creek are consistently high and show no readings outside the acceptable range.
- Wet weather DO values along Mill Creek, Wynants Kill and Poesten Kill show readings at ~ 4 mg/l

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Field Parameter Transect Summary

- Transects measured upstream of Albany Pool
  - Route 9 bridge over Mohawk River
  - 126th Street Bridge over Hudson River
- All Dry weather DO values are greater than 5 mg/l.
- The Mohawk River DO values are consistently high throughout the sampling (~ 8-10 mg/l).

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Field Parameter Transect Summary

- The Hudson River DO values showed lower values during wet events (~ 4–7 mg/l)
  - Implies upstream DO demand
- HRECOS gauge shows DO recovery by Schodack Island

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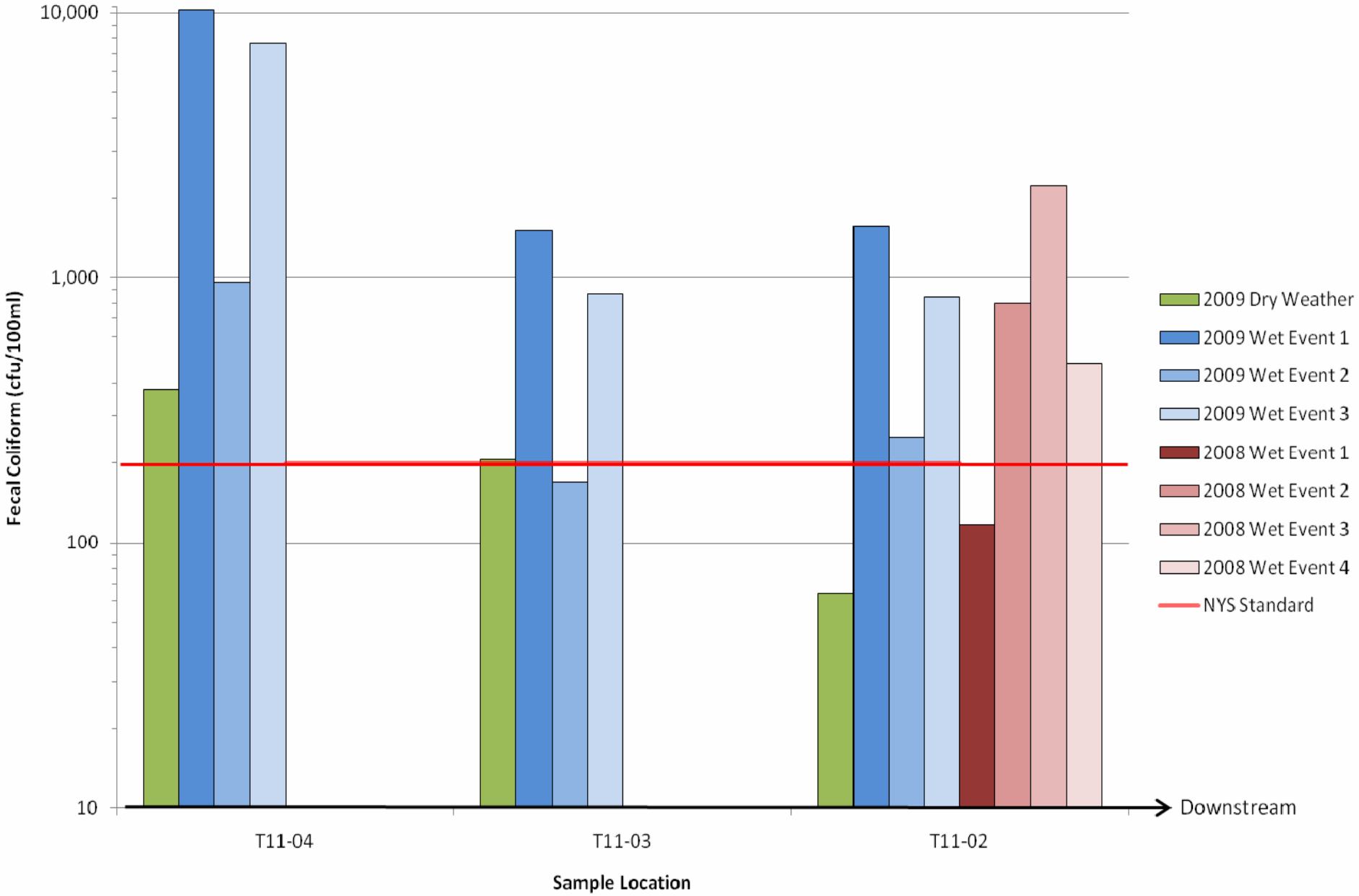
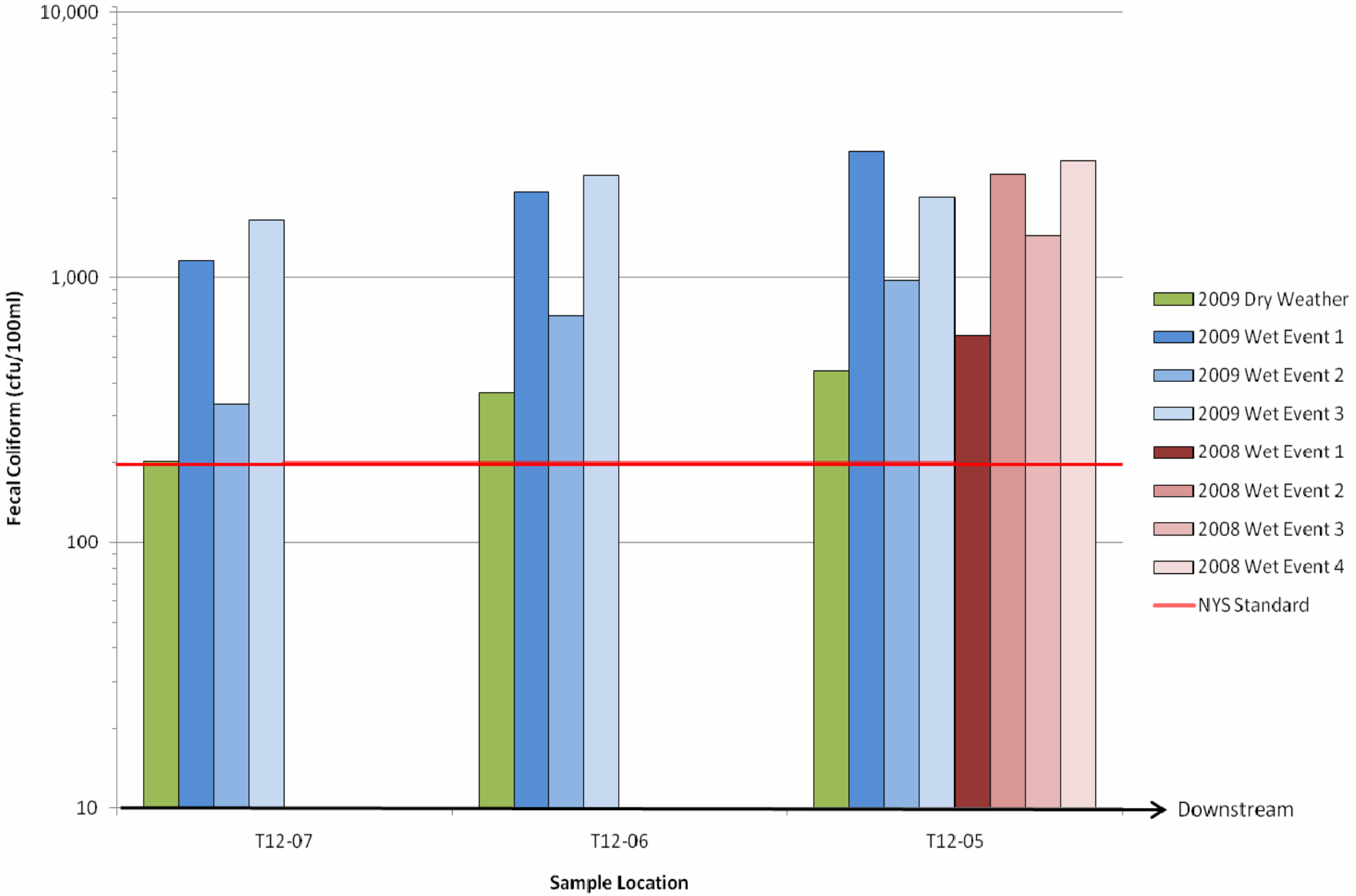
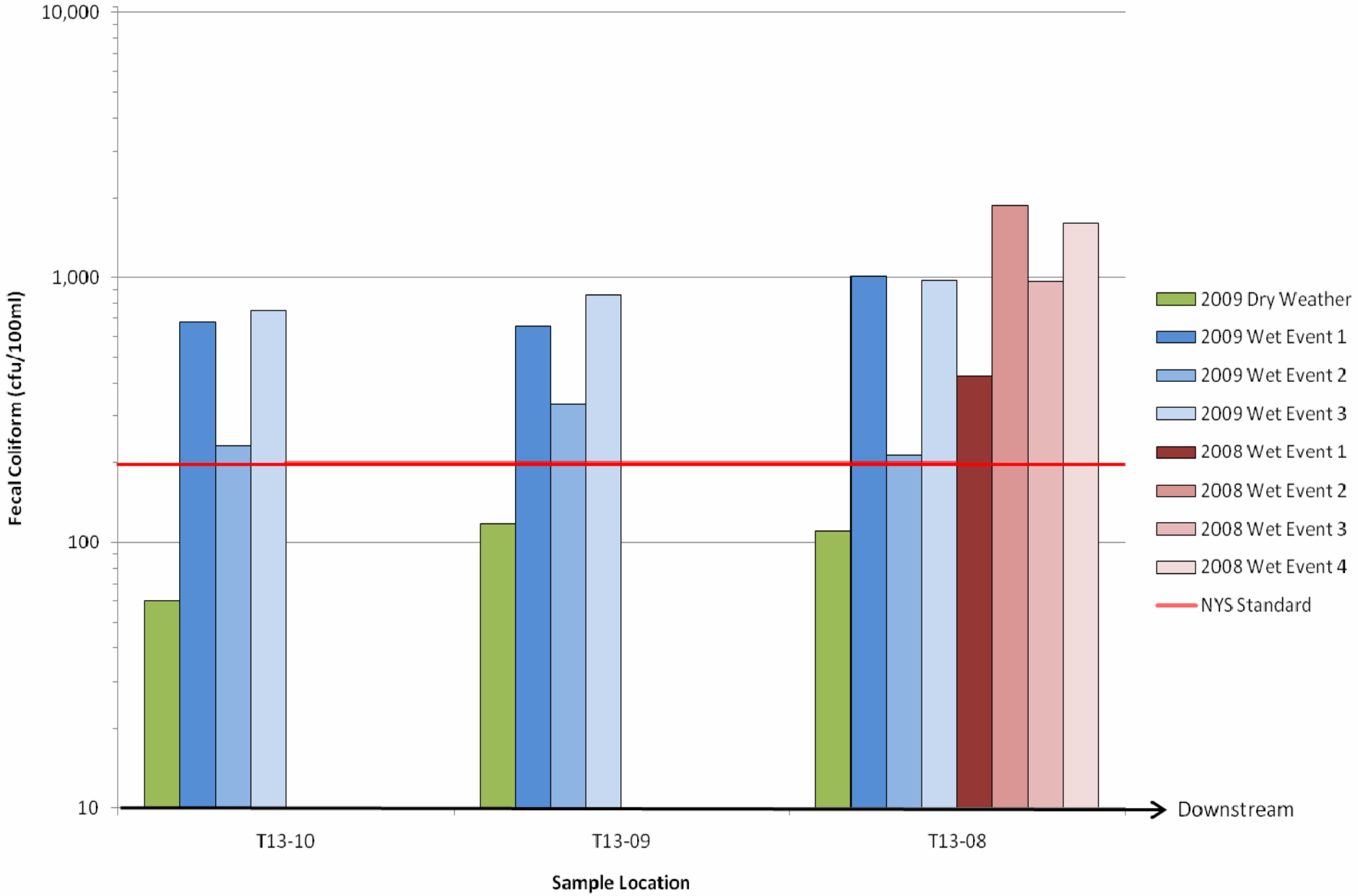
Wet Weather - Fecal Coliform, Geometric Means
Norman's Kill



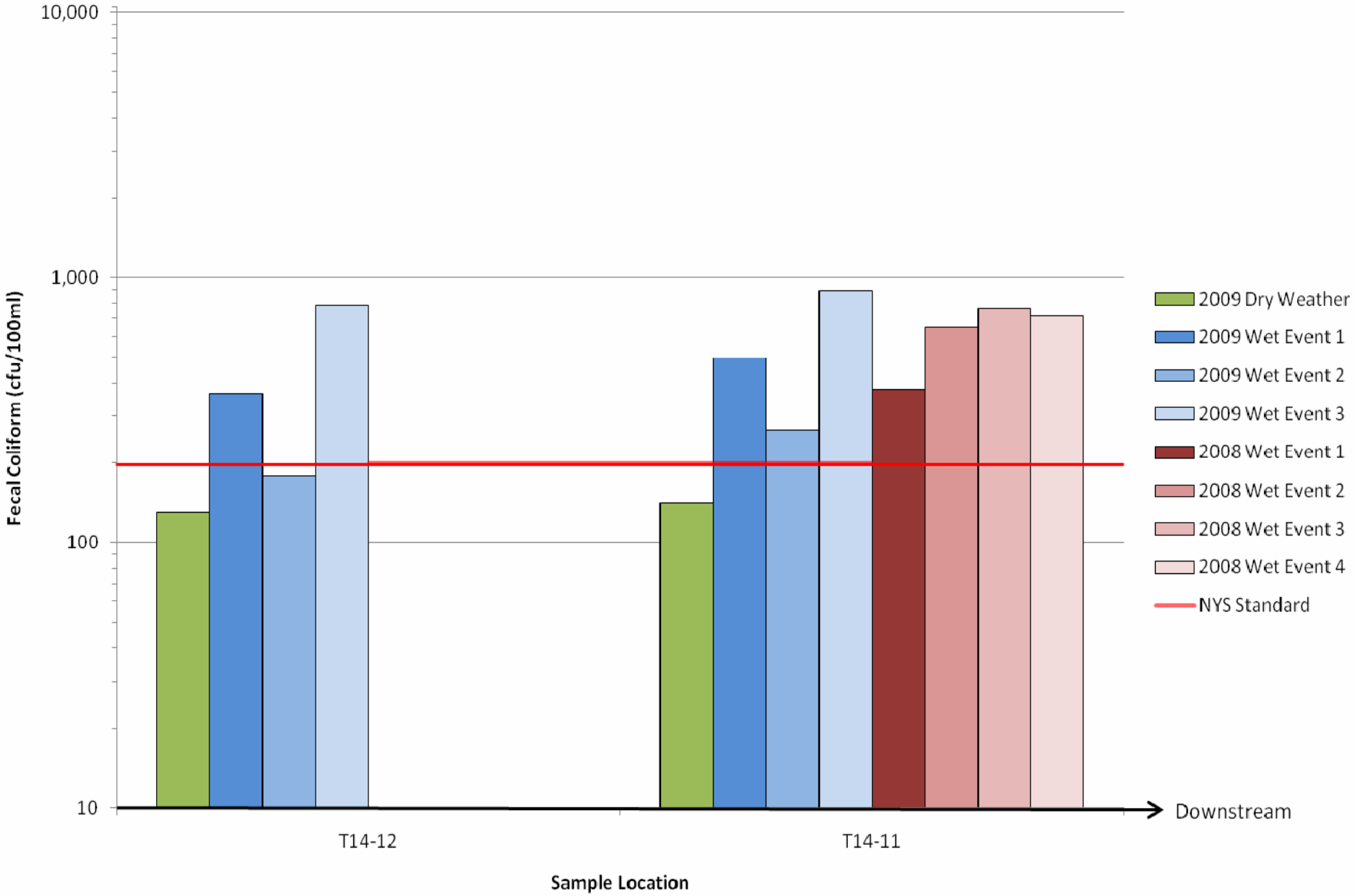
Wet Weather - Fecal Coliform, Geometric Means
Mill Creek



Wet Weather - Fecal Coliform, Geometric Means
Wynants Kill



Wet Weather - Fecal Coliform, Geometric Means
Poesten Kill



Wet Weather - Fecal Coliform, Geometric Means
Patroon Creek