



Department of
Environmental
Conservation

Integration of NY's Monitoring Program into NY's Vision Approach

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Outline

- NY's Monitoring Approach
- Integration of monitoring into NY's Vision approach
- NY's priority concerns and approach to implement
- Tools developed as a result of this process

Statewide Waters Monitoring Program

Monitoring by waterbody type

- Rivers/Streams
- Lakes/Ponds/Reservoirs
- Groundwater



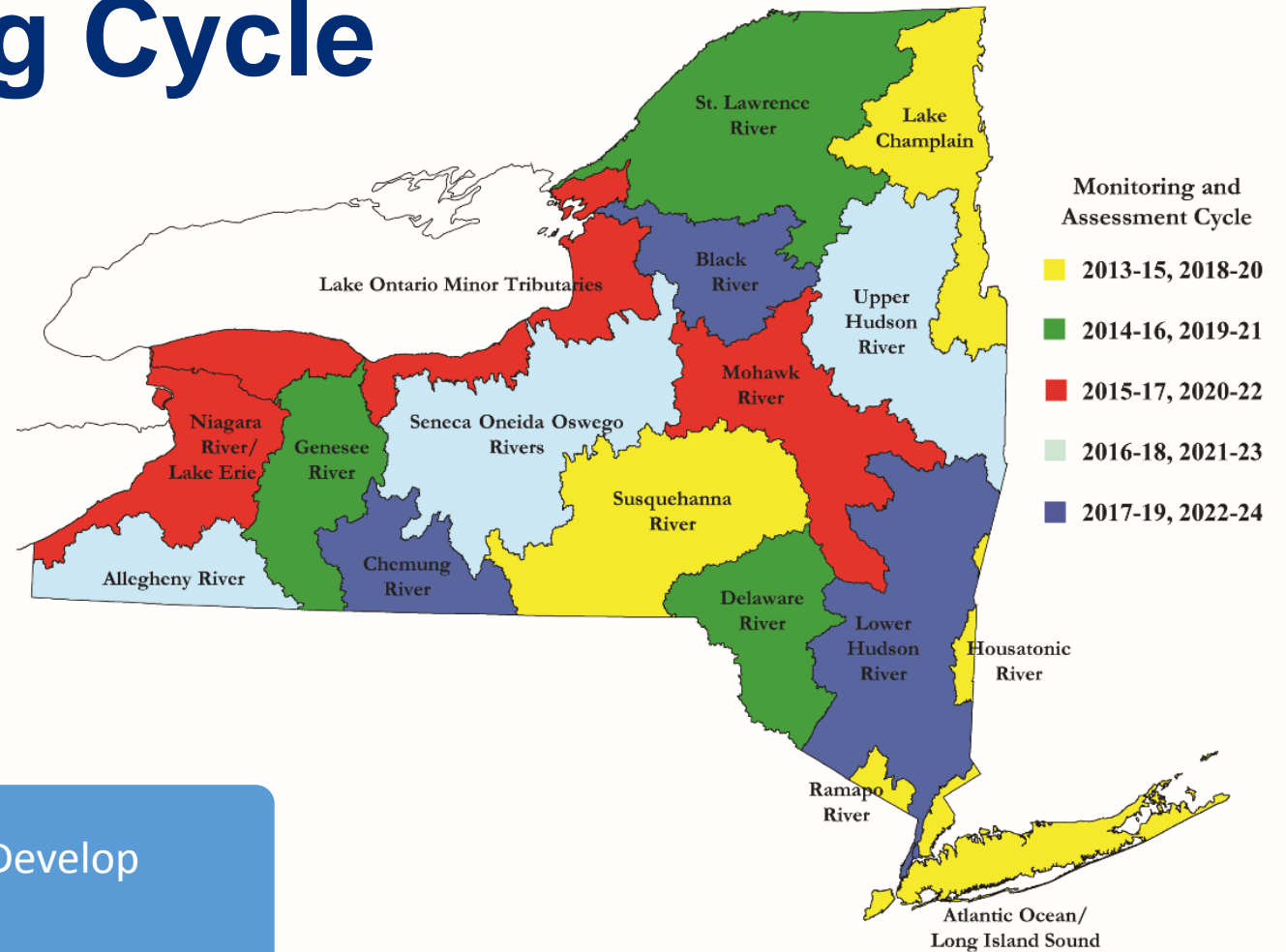
Five Year Monitoring Cycle

Year 0 - WAVE

Year 1 - Screening

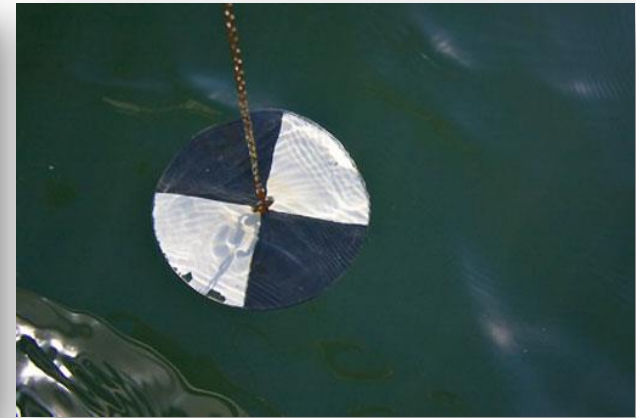
Year 2 - Intensives

Years 3 - 5 - Assessments, Update WI/PWL, Develop Protection/Restoration Strategies



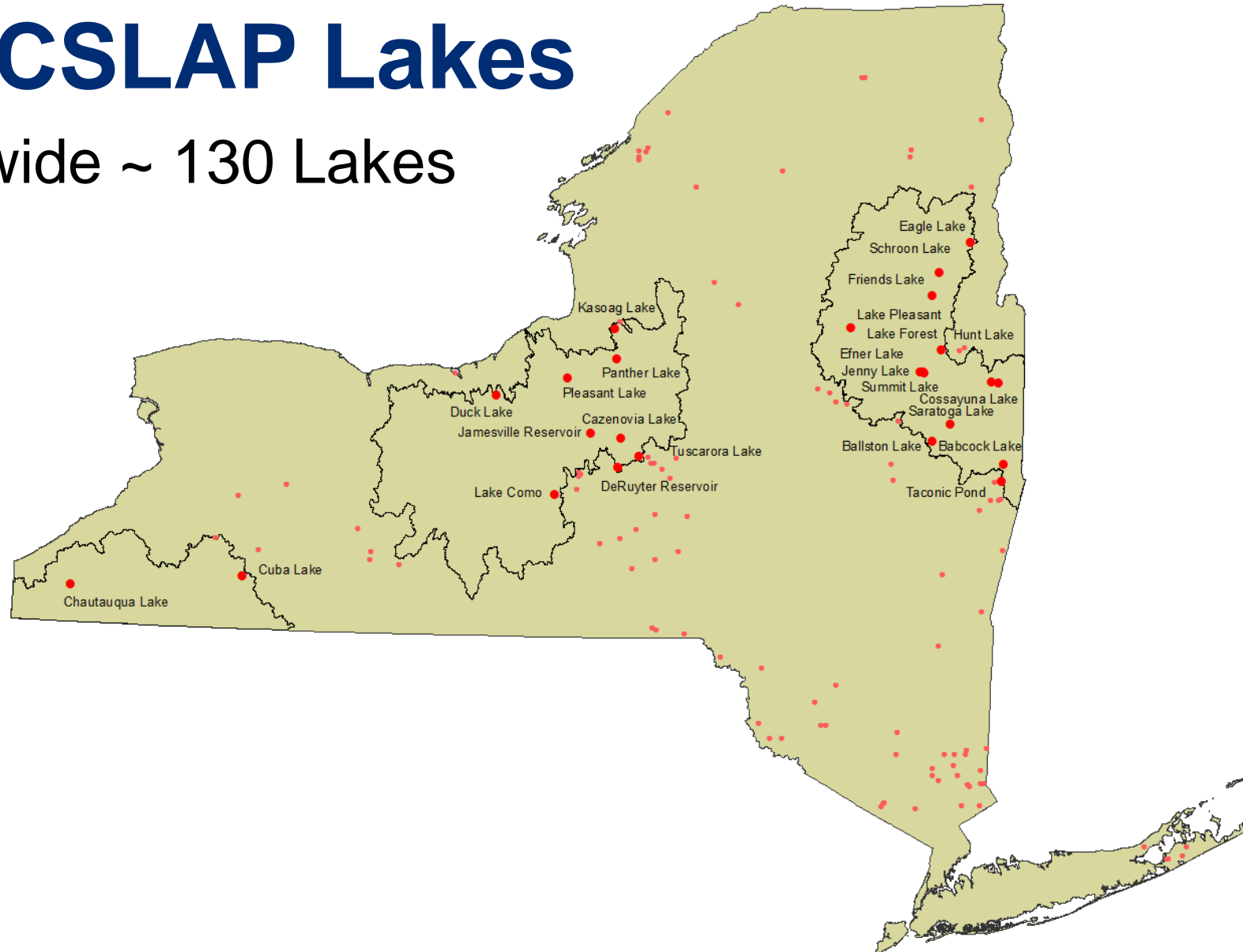
Lake Monitoring Programs

- Citizen Statewide Lake Assessment Program (CSLAP)
- Lake Classification and Inventory



2016 CSLAP Lakes

- Statewide ~ 130 Lakes



Monitoring Parameters

- Depth profile (depth, temp, DO, pH, conductivity, ORP)
- Surface water samples for trophic and standard limnological indicators
- Nutrients, algae, clarity, carbon, color, metals
- Bottom water samples if lake stratified
- Macrophyte (aquatic plant) identifications
- Invasive exotic plants
- Protected species (with Natural Heritage Program)



River and Stream Monitoring Programs

- Biological Monitoring Program
- Water Chemistry Sampling Program
- Water Assessment by Volunteer Evaluators (WAVE)



Screening Site Selection

Un-assessed Waters 20%

- Relies on Waterbody Inventory

Department/Outside Interest 30%

- TMDL Vision / Compliance Issues etc...

Regional Reference 10%

- > 75% Natural Cover, Background chemistries, good biology

Long-Term Trend 20%

- Longest historical sampling record.....many from 70's

Random Probabilistic 20%

- Statistical, unbiased sampling design

Screening Network Parameters

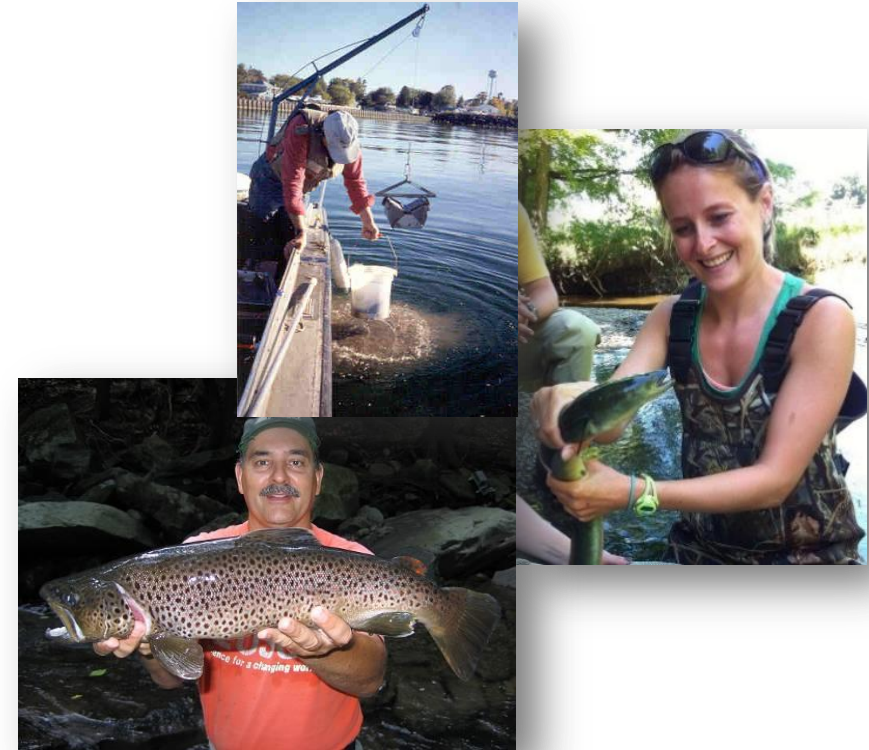
- Macroinvertebrate Community Analysis
- Habitat Assessment
- Sediment Toxicity
- Recreational Assessment
- Periphyton at suspected invasive sites



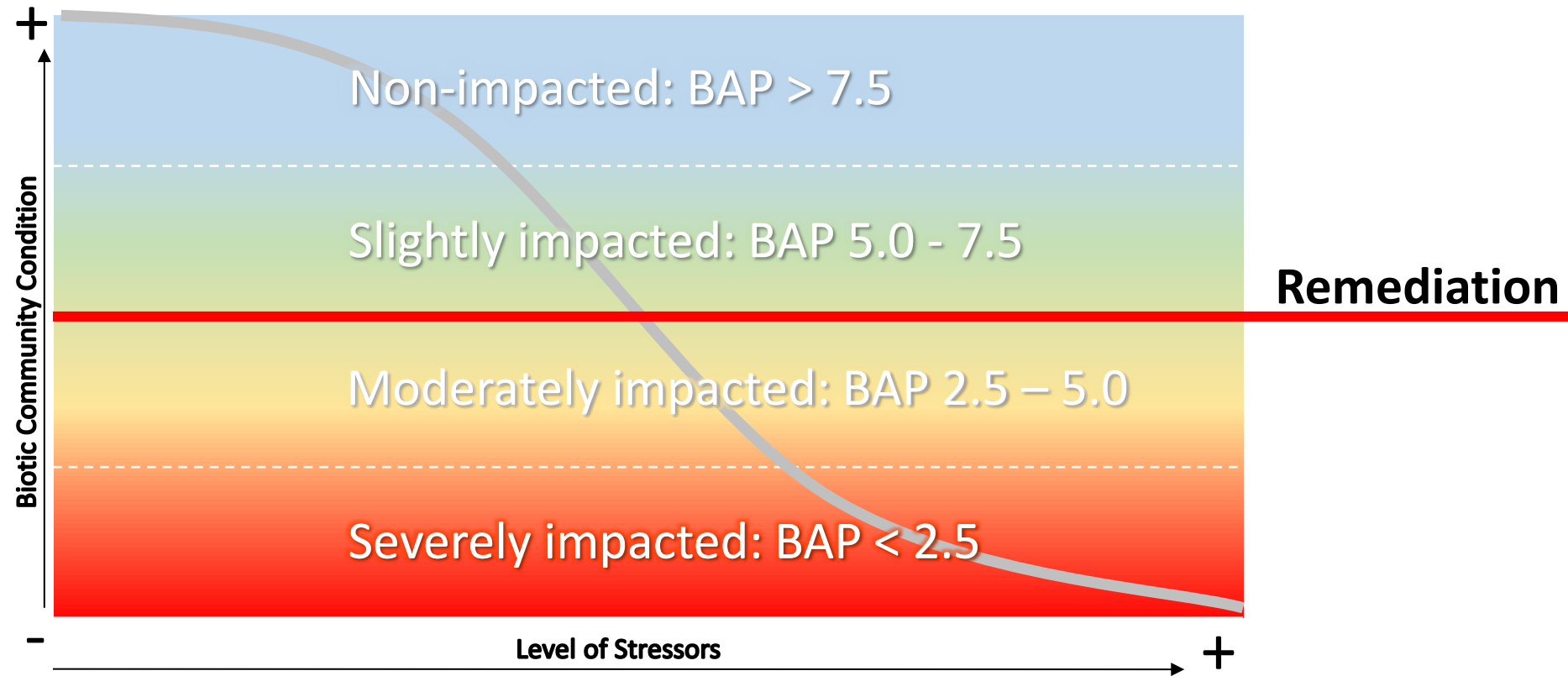
Intensive Network Parameters

Screening Network Parameters +

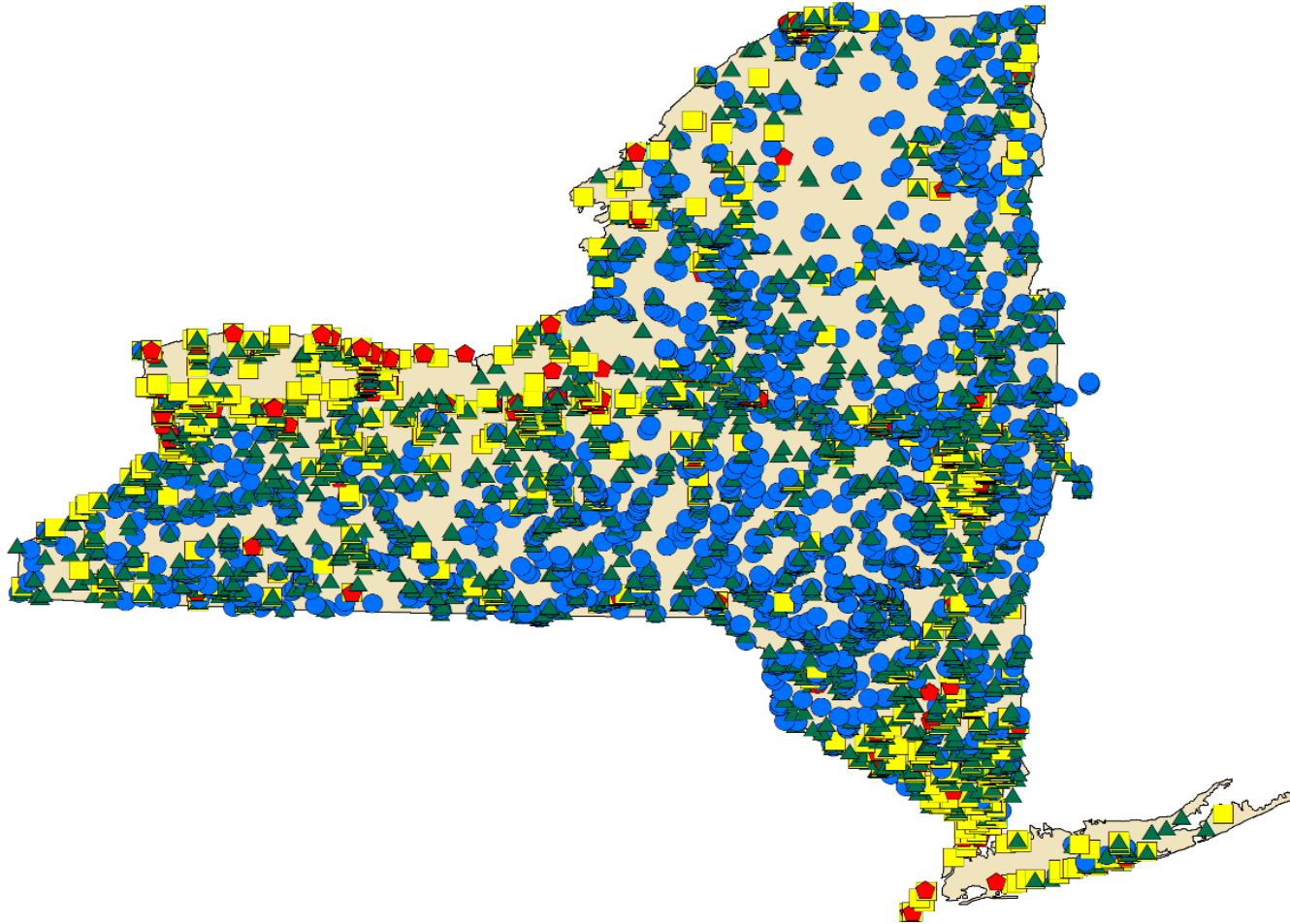
- Water Column Chemistry
- Periphyton Community Analysis
- Sediment Chemistry
- Macroinvertebrate Tissue Chemistry
- Pebble Count
- Fish Community Analysis



Macroinvertebrate Community Analysis



Biological Monitoring in NYS

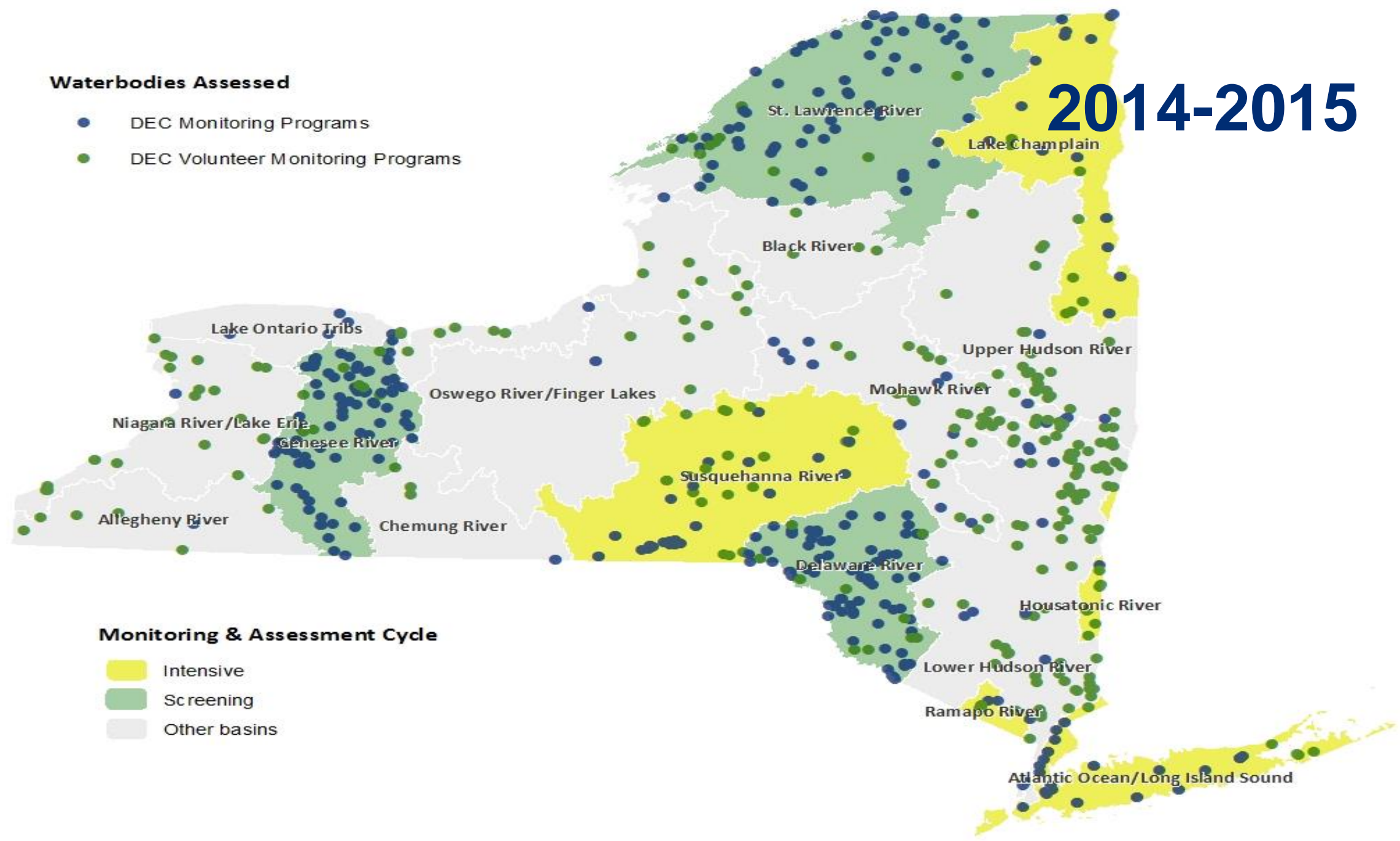


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2014-2015

Waterbodies Assessed

- DEC Monitoring Programs
- DEC Volunteer Monitoring Programs



Monitoring & Assessment Cycle

- Intensive
- Screening
- Other basins

Monitoring to Document Support of Uses

Uses Supported

- | | |
|--------------------|-------------|
| • Water Supply | Class A |
| • Shellfishing | Class SA |
| • Public Bathing | Class B, SB |
| • Recreation | All Waters |
| • Aquatic Life | All Waters |
| • Fish Consumption | All Waters |

Other Conditions

- | | |
|---------------------|------------|
| • Habitat/Hydrology | All Waters |
| • Aesthetics | All Waters |



Reporting on Use Attainment/Degradation

NYS's Water Body Inventory and Priority Waterbodies List

- (WI) Waterbody Inventory - All Waters of the State
- (PWL) Priority Waterbodies List - Troubled Waters

Provides supporting information for:

- Section 305(b) Water Quality Reports
- Section 303(d) List of Impaired TMDL/Waters
- NYSDEC WQIP Scoring
- NYSEFC CWSRF Scoring
- Other Funding Programs
- Responding to Public Inquiries
- Storing Institutional Memory

NY's Strategy to implement EPA's Vision

- Build on and improve the existing 303(d) program,
- Use monitoring data collected by DEC,
- Integrate information from other Division of Water (DOW) programs,
- Incorporate alternative plans when applicable
- Foster new partnerships and enhance existing partnerships.
- <http://www.dec.ny.gov/chemical/23835.html>

Monitoring data important part of process

- Evaluate level of impairment
- Help to organize waterbodies
- Track progress toward improvement
- Used to assess recovery potential



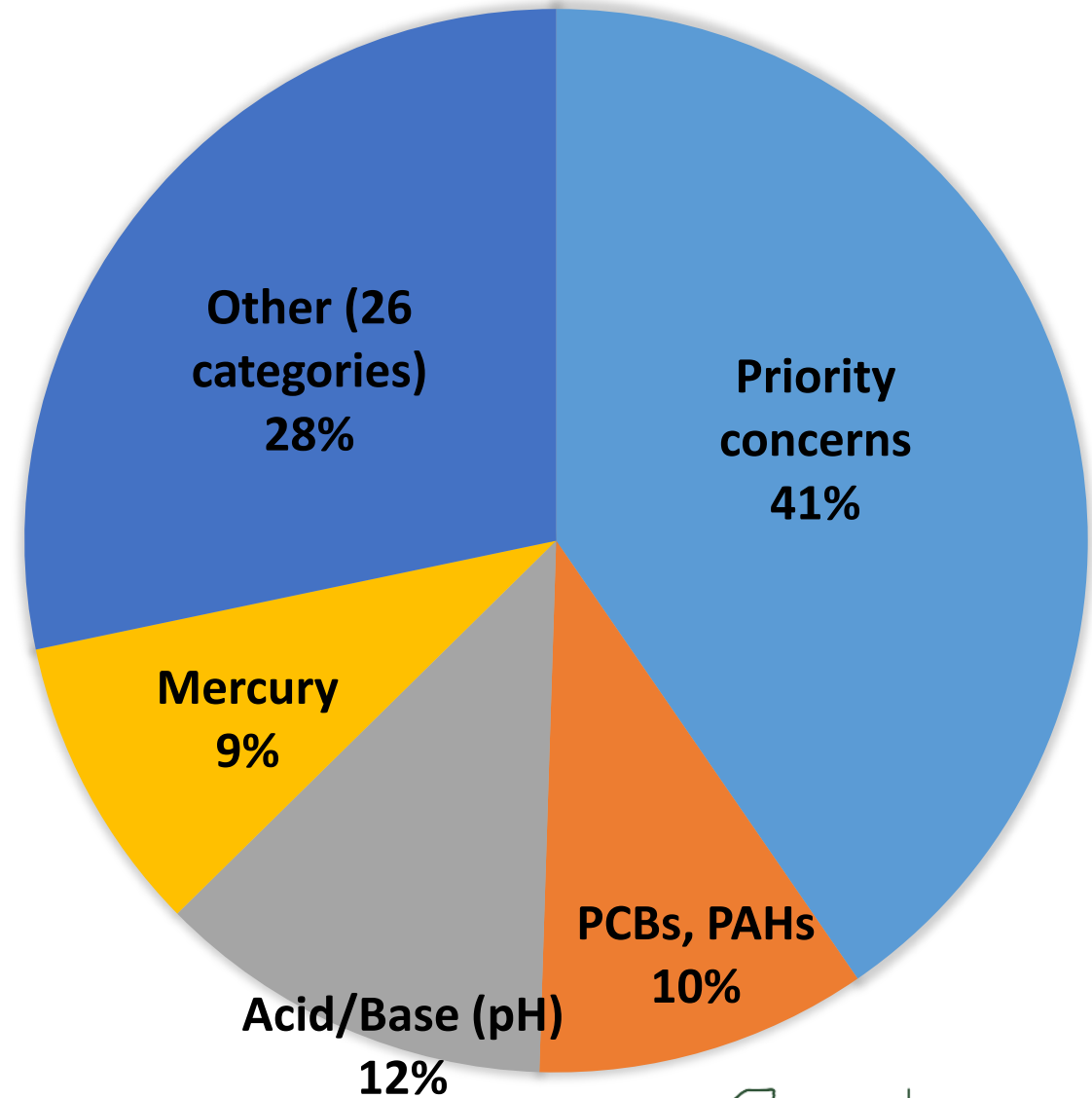
Priority concerns

Pollutants of Concern

- Nutrients
- Pathogens
- Dissolved oxygen

Priority Uses—Public

- Drinking water supply
- Primary contact recreation
- Shellfishing



Select & evaluate waterbodies

- Identify criteria for scoring to prioritize/rank waterbodies
- Evaluate top ranked waterbodies



Scoring criteria developed for each metric

Generally, greater negative impact → higher score

Examples of metrics:

- Number of related pollutants
- Number of uses impaired
- Phosphorous & Chl a concentrations
- Active public water supply
- Population served by public water supply
- Public access to waterbody
- Ecological importance
- Incidence of blue-green algae blooms



Examples of criteria

Class A

- Active public water supply
- Population served by public water supply
- Multiple impairments
- Number of blue-green algae blooms

Streams/Rivers

- Trout/trout spawning
- Public access
- Biological impairment
- Multiple impairments
- Multiple uses impaired
- Proximity to other impaired streams/rivers



Prioritization process

Step 1: Rank by priorities	Step 2: Evaluate impairment level	Step 3: Select Waterbodies	Step 4: Determine feasibility of TMDL	Step 5: Analysis selected waterbodies
Active public water supply (PWS)	Harmful algal blooms (HAB)	Rank list and select priority waterbodies	Connectivity	Pollutant source analysis
Population served by PWS	Multiple use impairment	Identify & document limitations	Watershed size	Data assessment to determine schedule
Ecological importance	Multiple pollutant impairments	Consult with staff	Public interest	Existing watershed plan or similar plan
Class	Beach closures			Identify financial benefits
Public access	BAP Score			
Population				



Criteria	Response	Points	Qualitative	Description
Public water supply	Y	1		Waterbodies with active PWS
	N	0		
Population served	0	0		The greater the population served the greater the public impact and potential for implementation. Range is based on the PWS waterbodies listed on the 303(d) list; scoring range may need be adjusted for future analysis.
	1-10000	0.25		
	10001-50000	0.5		
	50001-150000	0.75		
	>150000	1		
Harmful Algae Bloom	0/0	0		No reports
	1/1	0.25		One report, one year only
	>1/1	0.5		More than one report, one year only
	>1/>1	1.5		At least one report for multiple years
Number of related impairments	1	0.25	Less connected	How many individual impairments can likely be addressed by a single TMDL (e.g. nutrients, DO, pathogens, silt/sediment). Max of 4 related impairments in this list set point range.
	2	0.5		
	3	0.75		
	>3	1	More connected	
Number of uses impaired	0	0	No uses impairments	Up to 6 uses are evaluated in waterbody assessment, but in most cases no more than 4 are likely to be related. Most waters have 2 or less related uses impaired. (water supply, recreation, fishing, aquatic life, aesthetics, habitat)
	1	0.25		
	2	0.5		
	3	0.75		
	>3	1	Multiple related uses impaired	
Chl-a concentration	<6	0	Good	June through September average concentration of chlorophyll-a. >30 was used because it is the upper bound of the blue-green algae criteria
	10-19	0.25		
	20-29	0.5		
	>30	1	Poor	
Health impacts	Yes	1		When data from DOH is available; e.g., DBPs, drinking water advisories
	No	0		

Criteria	Response	Points	Qualitative	Description
Class	A	1	Higher priority	Waterbody classification
	B	0.5		
	C	0.25	Lower priority	
T/TS	TS	2	More protection	Trout (T) or trout spawning (TS) designated stream?
	T	1		
	None	0	Less protection	
Related Pollutants Impairments	1	0.25	Less	How many related impairments could be addressed by a single TMDL?
	2	0.5		
	3	0.75		
	>3	1	More	
Proximity (connectivity)	0	0	Fewer	How many additional contiguous HUC12s are also listed as impaired? Limited to those HUC12s in the same stream network with multiple segments that impaired all for same reasons in same area
	1	0.25		
	2-5	0.5		
	6-10	0.75		
	>10	1	More	
Multiple Use Impairments	0	0	Fewer	How many use impairments will be improved/removed by a single TMDL?
	1	0.25		
	2	0.5		
	3	0.75		
	>3	1	More	
Public Access	None	0	Limited access	No readily apparent means of access for general public
	Private	0		
	Adjacent	0.5		
	Public	1	Easy access	Access encourages: boat ramps, municipal parks, recommended fishing
Ecological Importance	To be determined			As data from NYS DOH becomes available, information about DBPs, beach closures & what closed for.
Biological Assessment Profile (BAP) score	<1.25	1	Worse	Biotic assessment profile data based on macroinvertebrate data
	1.26-2.5	0.75		
	2.6-3.75	0.5		

Flowing waters

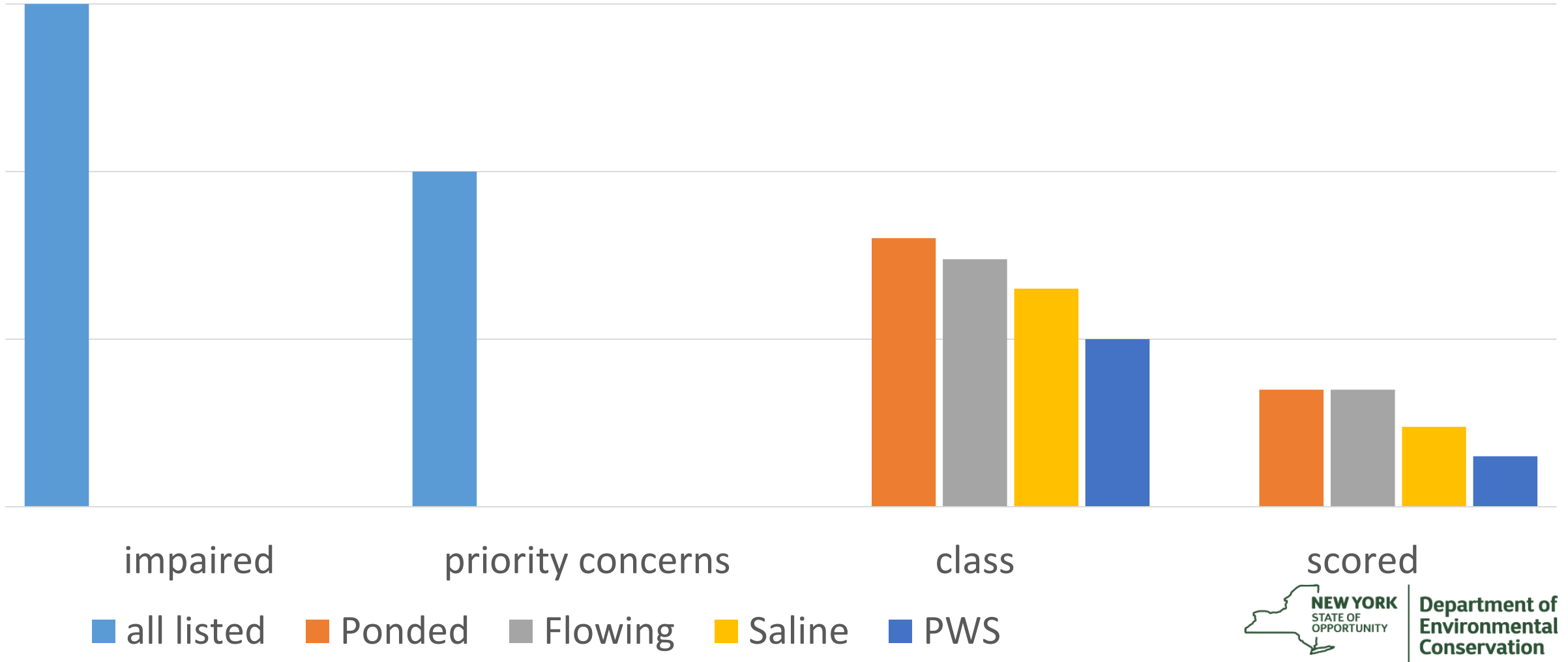
Name	Class	T or TS	Access	Multiple Pollutants	Multiple Use Impairments	Proximity	BAP Score	Ecological Importance	Score
Saw Mill River	A	-	Public	DO, Path, Nut	Bath, Rec, Aquatic Life	5	3.57	TBD	
Steele Creek	A	TS	None/Private	Nut, Slt, Alg	Water supply	1	Need Data	TBD	



Name	Class	T or TS	Access	Multiple Pollutants	Multiple Use Impairments	Proximity	BAP Score	Ecological Importance	Score
Saw Mill River	1	0	1	0.75	0.75	0.5	0.5	0	4.5
Steel Creek	1	2	0	0.75	0.25	0.25	0	0	4.25



Each step in the prioritization process helps to refine & focus the impaired waterbodies list to the most effective water quality improvement



Evaluate waterbodies

Includes discussion with regional DEC staff, other state agencies to:

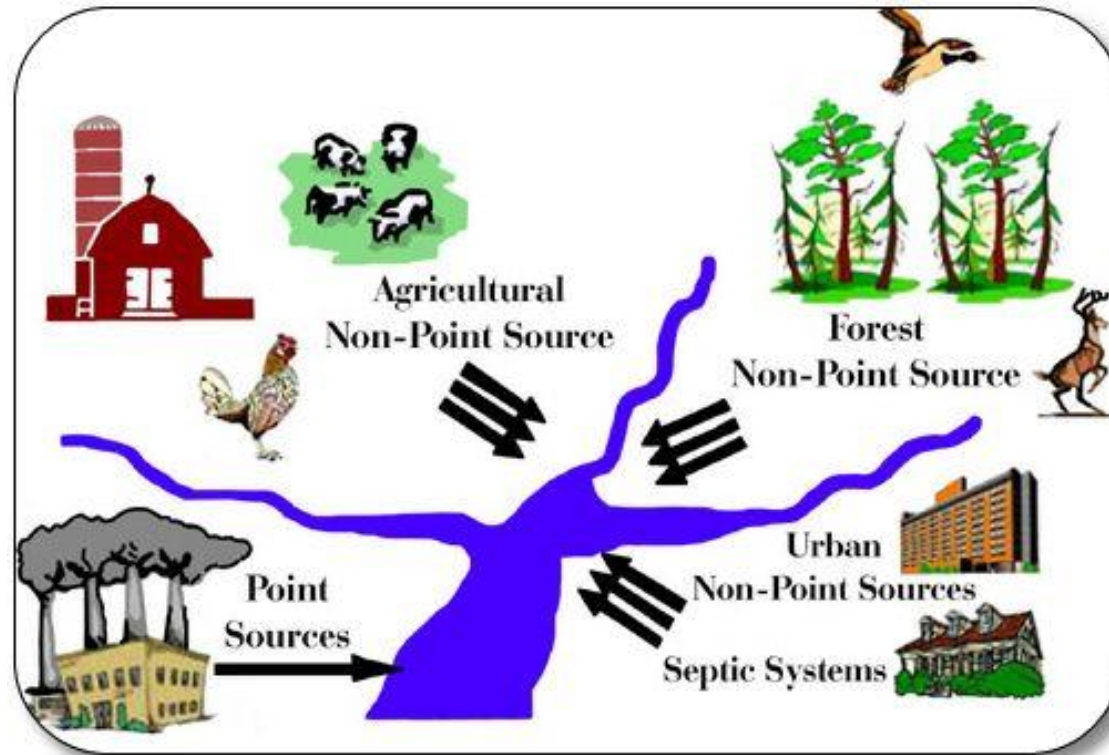
- Identify existing plans or models
- Learn about water quality activities
- Identify opportunities for collaboration

Detailed analysis of top ranked waterbodies to:

- Evaluate feasibility of TMDL or interim alternative plan
- Assess recovery potential

TMDL-lite Screening tool

- Simple model covers major aspects of a TMDL analysis
- Assesses loads for stormwater, septic, and point sources



TMDL-lite Screening tool

- Understand relative load contribution by source (e.g., developed, agriculture, septic)
- Simple analysis to determine waterbody potential recovery response (e.g., estimated reductions needed)
- Help identify most appropriate watershed management approach (e.g., TMDL or watershed plan)

TMDL-lite Stormwater Loads

- Estimate stormwater loads using simple method
- Based on land use, precipitation, and simple hydrology

stormwater load = pollutant concentration x export factor

TMDL-lite Septic Loads

- Estimates the septic nutrient load.
- Based on population served by septic, and proximity to surface waters

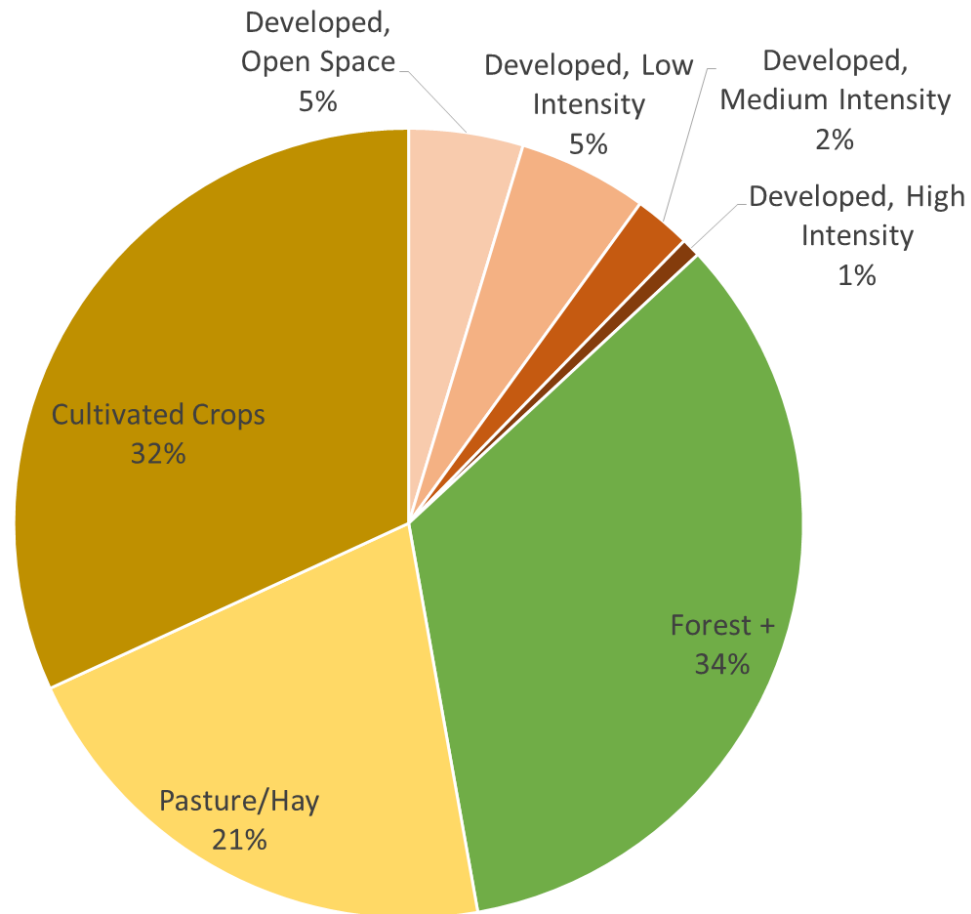
septic load = septic loading factor x number of septic's

TMDL-lite Point Source Loads

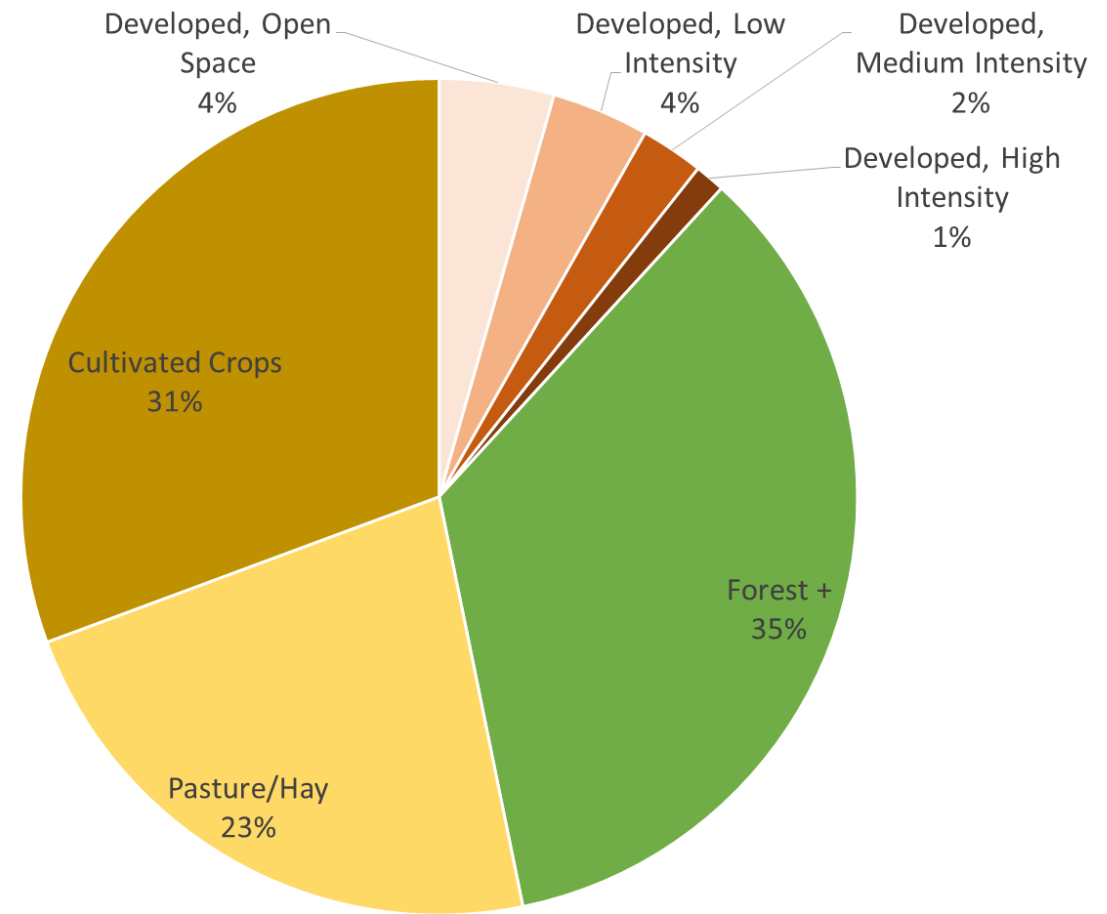
- Quick approximations can be made using GIS-Layer
- More reliable estimates can be determined through Discharge Monitoring Report (DMR) data

TMDL-lite: Lake Champlain

TMDL

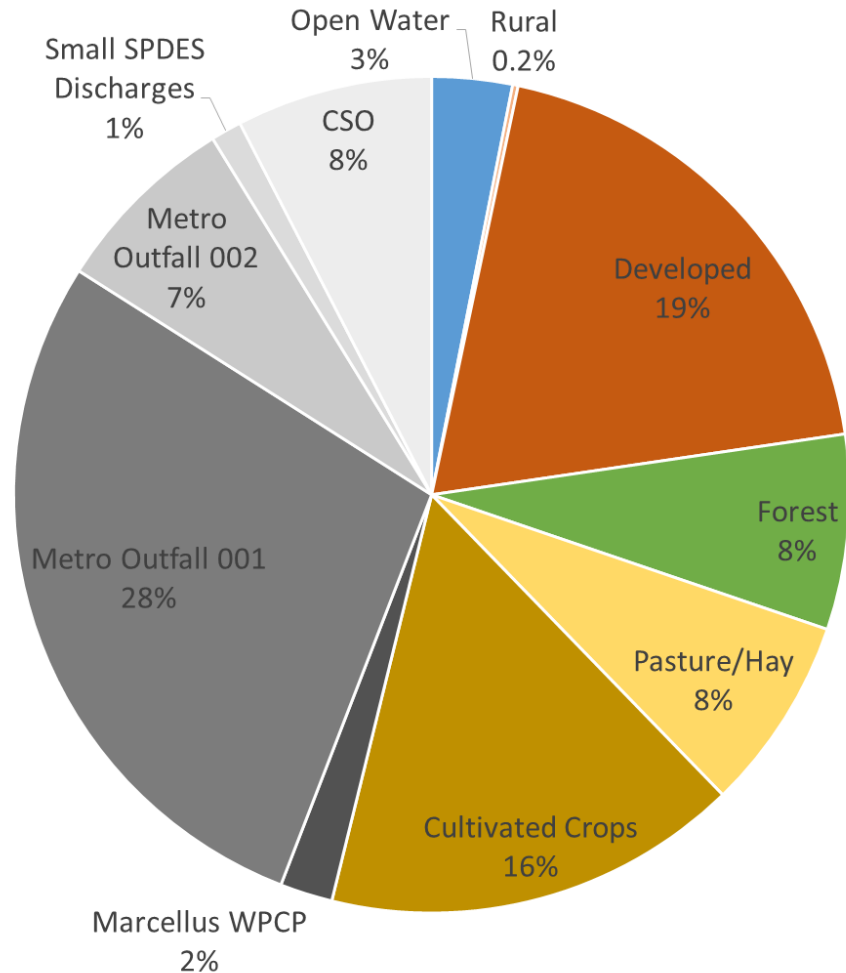


TMDL-lite

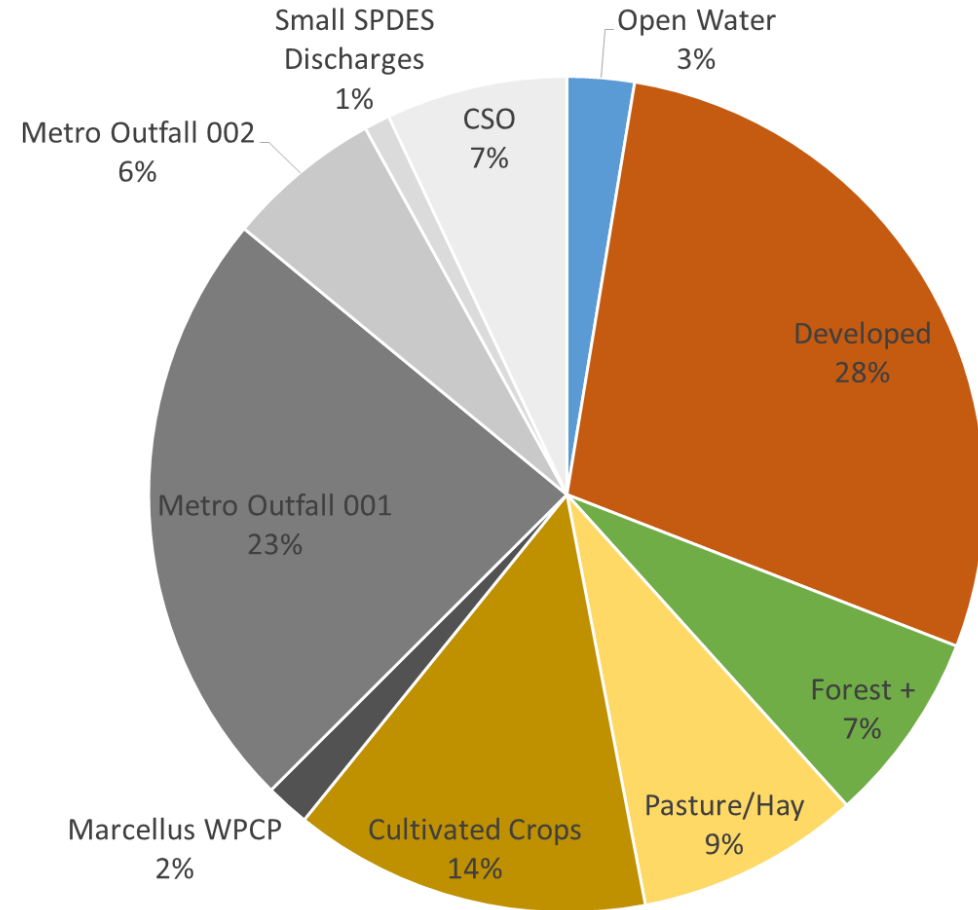


TMDL-lite: Onondaga Lake

TMDL



TMDL-lite



TMDL-lite Waterbody Budget

- Ability to estimate reductions needed
- Load to waterbody based on source analysis
- Load to waterbody based on monitoring data – will include all sources/sinks
- Total maximum load determined from WQ standard/goal (e.g., max load that will produce 20 ug/l of P in lake)



Planning & tracking

- Where to develop TMDLs, watershed plans, or other alternative plans, and
- Where to prioritize monitoring work for planning and recovery tracking.

Example tracking

Database to track water quality management plans

1. TMDLs and watershed plans
2. Other plans (e.g., LTCPs, consent orders, etc.)

SEG ID	Waterbody	Class	Waterbody Category	Management Action	Pollutant	Date Issued	Recommended actions	Status
1302-0004	Peach Lake	B	Impaired	TMDL	Phosphorus	2009	Sewering	Sewered - 2013
0101-0023	Scajaquada Creek	B	Impaired	LTCP/ Consent Order	Odors Floatables Pathogens	2004	LTCP BSA Bird Island WWTP	PCM plan to be submitted 3/2015

More work to be done...

- Improve integration with DOW programs
 - Monitoring
 - Permits
 - Flood & Dam Safety
 - Funding
 - Compliance



Thank You

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