Skaneateles Lake & Watershed Planning

Central New York
Regional Planning & Development Board

A Crash Course in Watershed Planning

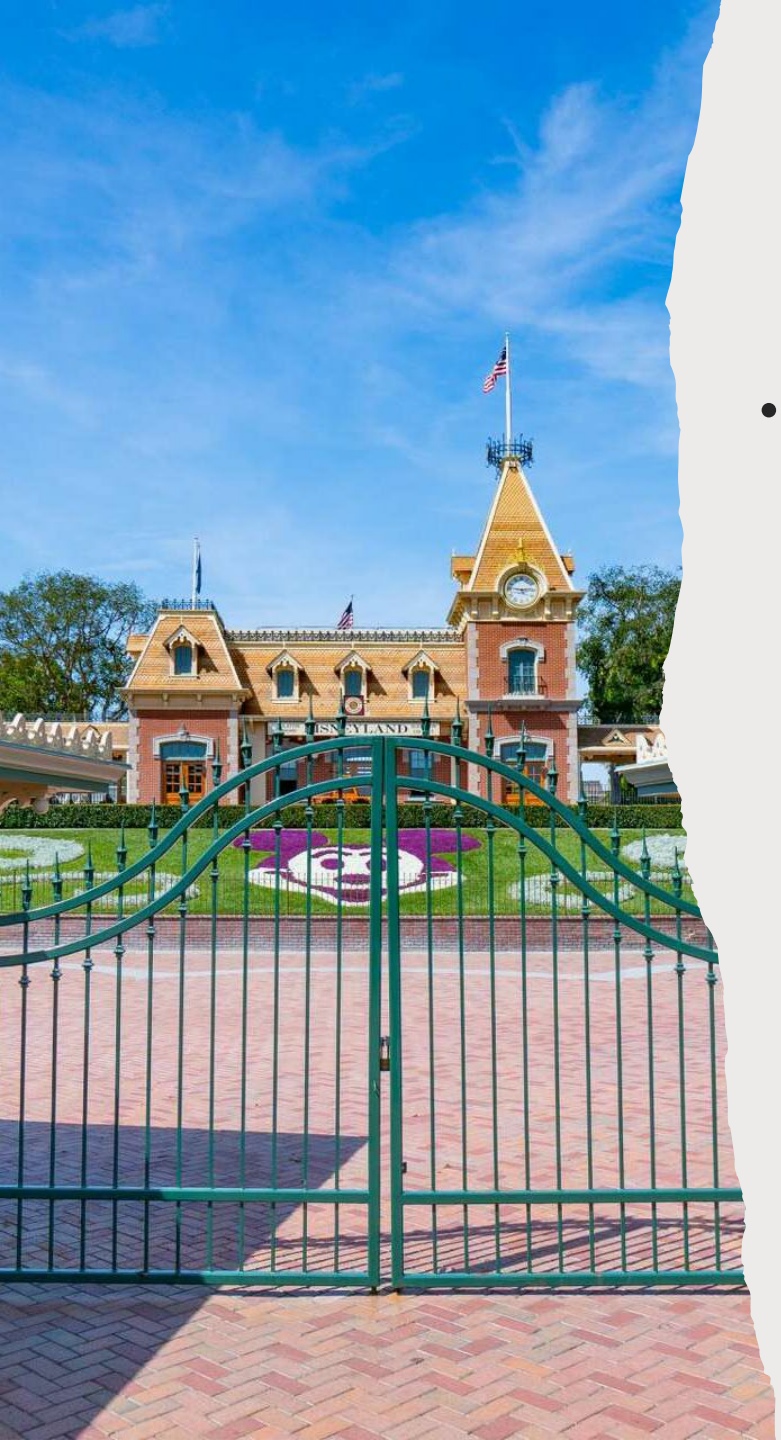
- These three vocabulary words are all you need to get started in Watershed Planning:
  - BMP
  - Watershed / Subwatershed
  - Nutrient

BMP: Best Management Practice

- What is a BMP?
  - The most effective and practicable methods, strategies, or combinations of practices, including both physical structures and behavioral changes, used to prevent, reduce, or treat pollution, particularly from nonpoint sources, to achieve environmental or water quality goals.
- Short Version: BMPs are anything you can do in a watershed to improve water quality

BMP example: Livestock access systems

- Livestock *look* picturesque in a creek but…
- This can lead to erosion of the streambank
- Gives manure & bacteria a quick path to wherever this stream flows
- Access control:
  - Fencing to keep the livestock out of the creek
  - Add a new water supply
  - In some cases, associated with larger, healthier livestock

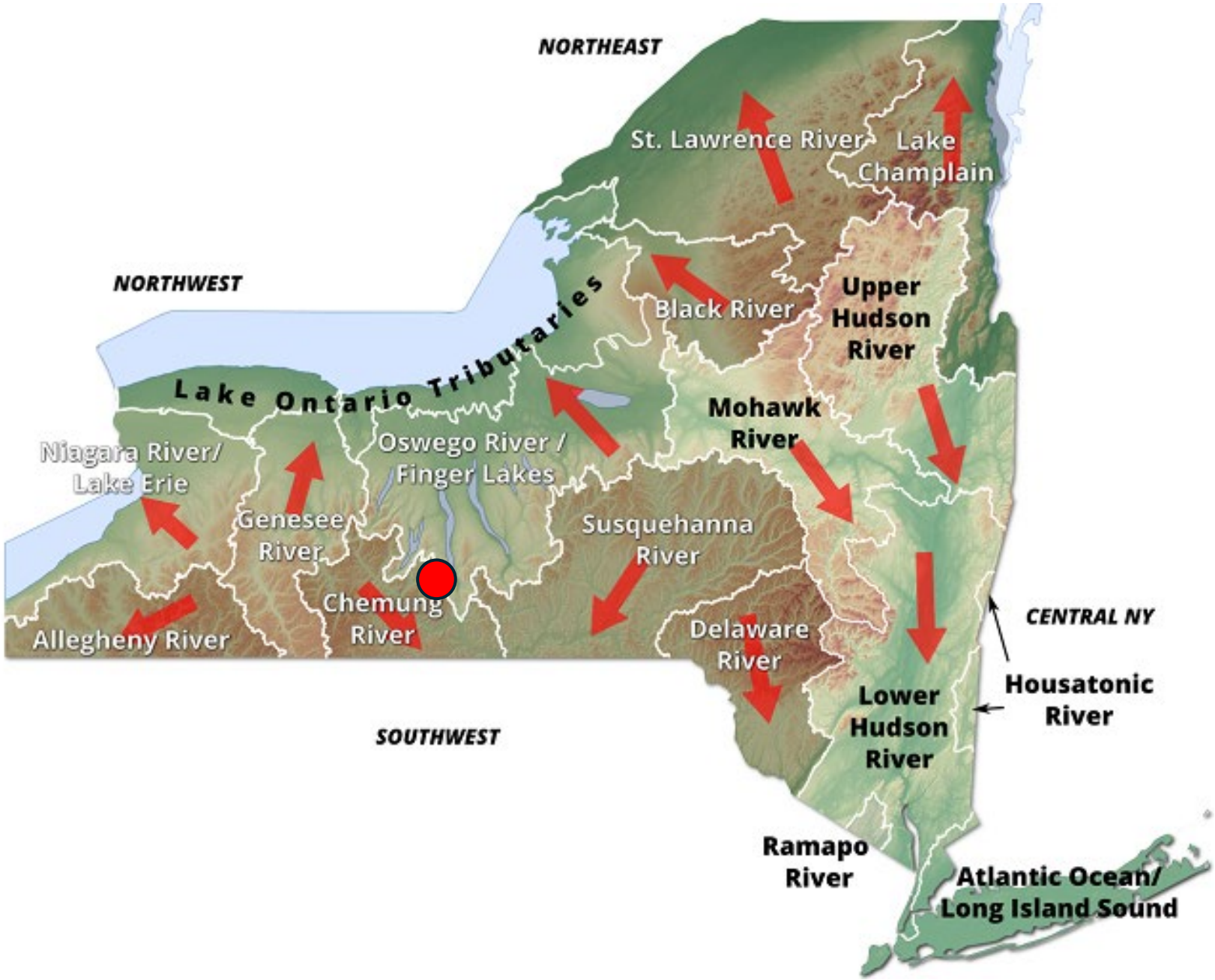


Watershed

- What is a Watershed?
  - Being in a watershed is not like being in Disney World: it's not like you're sometimes in a watershed and sometimes not.
  - It's more like being in the continental United States: you're always in a state. When you leave a state, you go into another state.
  - Same with watersheds. You're always in some watershed.
  - A watershed is shaped by topography: it's basically the 'bowl' formed by topography that you're in.
  - When it rains in a given place, where does that water end up?

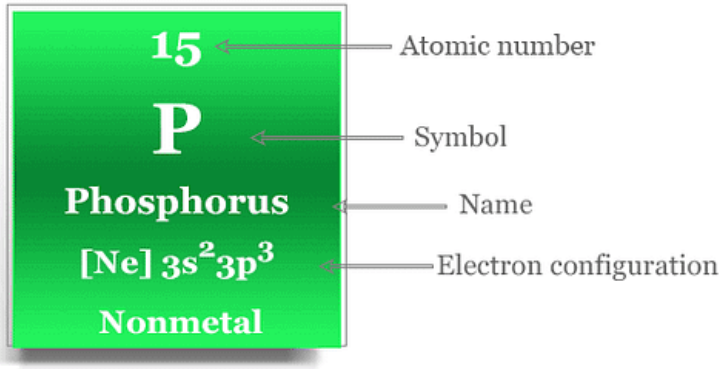
Watersheds of NYS

- If you go to Watkins Glen Speedway and you knock a cup of water off the bleachers, that water (theoretically) makes its way to the Seneca River, to Three Rivers in Clay, and north via the Oswego River to Lake Ontario
- A “subwatershed” is just a watershed nested inside another watershed (i.e., Seneca Lake has its own subwatershed)



Nutrients

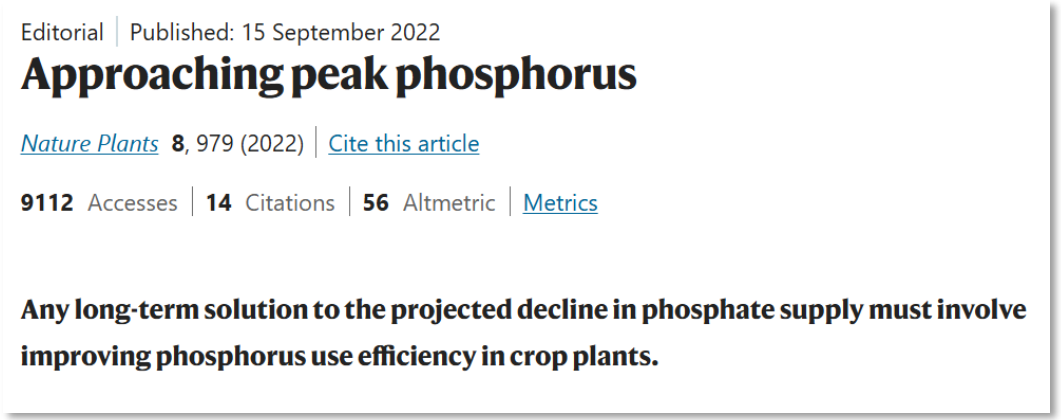
- Nutrients are critical to plant and animal life. Without nutrients in a lake, it's sterile: some glacial lakes have very low nutrient levels
- Phosphorus (P) and Nitrogen (N) are the two nutrients that watershed planning focuses on
- Of the two, N is relatively abundant and can be "manufactured"; P is relatively rare in nature
- BOTH are critical to life: they're not interchangeable.
- Both are found in animal waste and in man-made fertilizers



P is relatively rare in nature. It's also a finite resource.

Periodically, this comes up in the media with a headline like "Have we reached peak phosphorus?"

Experts say: it's unlikely we'll run out of P sources in the next century. But in the long-term, it's a very real concern


Editorial | Published: 15 September 2022

Approaching peak phosphorus

Nature Plants **8**, 979 (2022) | Cite this article

9112 Accesses | **14** Citations | **56** Altmetric | Metrics

Any long-term solution to the projected decline in phosphate supply must involve improving phosphorus use efficiency in crop plants.


The Atlantic

SCIENCE

HUMANITY IS FLUSHING AWAY ONE OF LIFE'S ESSENTIAL ELEMENTS

We broke phosphorus.

By Julia Rosen

Why are we talking about phosphorus? I thought we were talking about watersheds?

- Nutrient levels in a lake need to be in balance:
  - Too little P & N, and you don't have enough "plant food" to make good fish / wildlife habitat
  - Too much P & N and you get out-of-control algae growth
  - We also don't currently have a better way to control harmful algal blooms through natural systems than by limiting phosphorus levels
  - When we talk about sources of phosphorus, we usually mean:
    - Animal waste:
      - manure, septic systems, wastewater treatment plants
    - Fertilizers:
      - lawns, row crops
    - Sediments on the bottom of lakes, sometimes

P vs. N

- They’re BOTH needed
- Nitrogen is 100 times more abundant in Skaneateles Lake than phosphorus
- Controlling P levels is typically “easier” / more manageable

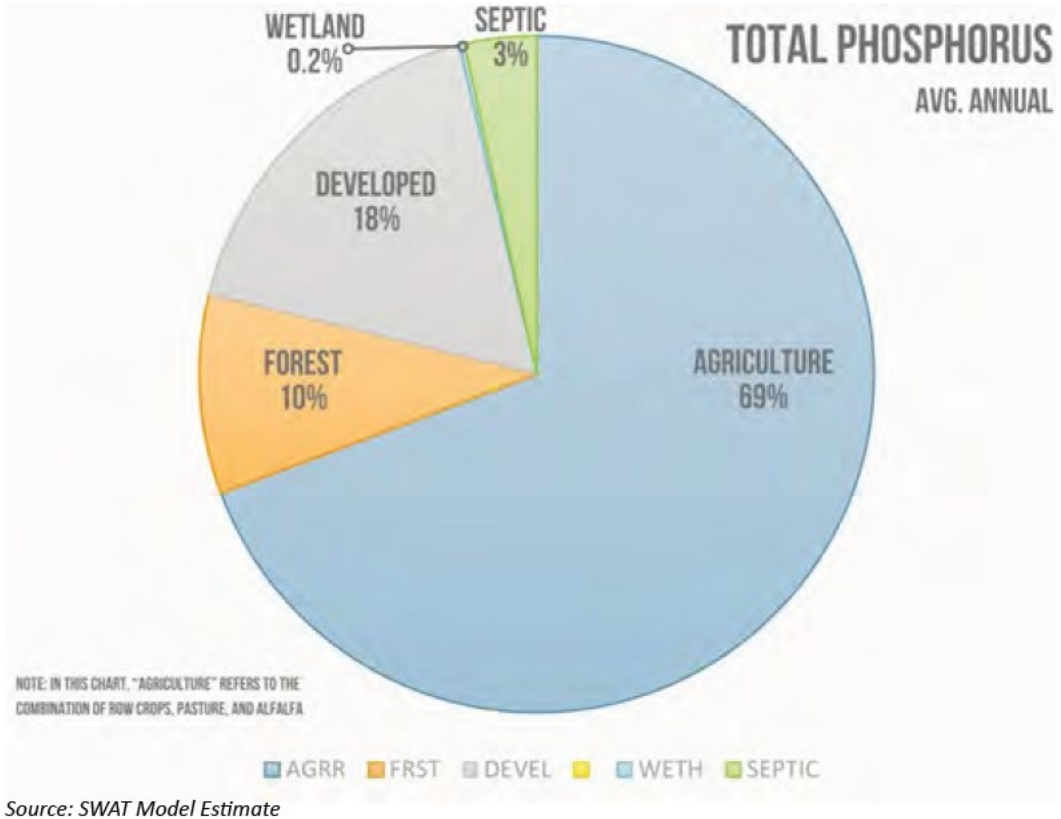
Skaneateles Lake Watershed Nine Element Plan for Phosphorus

Table 3.1 – Phosphorus Loading by Land Cover

Land Use / Source Category	Percent of Watershed	Phosphorus Loading (lbs.)	Lbs. / Acre	Percent of Total Loading
Row Crops	13%	7,859	1.60	58%
Hay / Alfalfa	6%	298	0.13	2%
Forested Land	60%	1,293	0.06	10%
Pasture	14%	1,246	0.24	9%
Developed / Urban	6%	2,376	1.12	18%
Wetlands	2%	33	0.05	0.2%
Septic Systems	N/A	467	N/A	3%
TOTAL	**100%**	**13,573**		**100%**

Loading by land use is based on the Soil and Water Assessment Tool estimates

Figure 3.1 – Phosphorus Loading by Land Cover / Source (kg)



Source: SWAT Model Estimate

Sources of Phosphorus in the Skaneateles Watershed

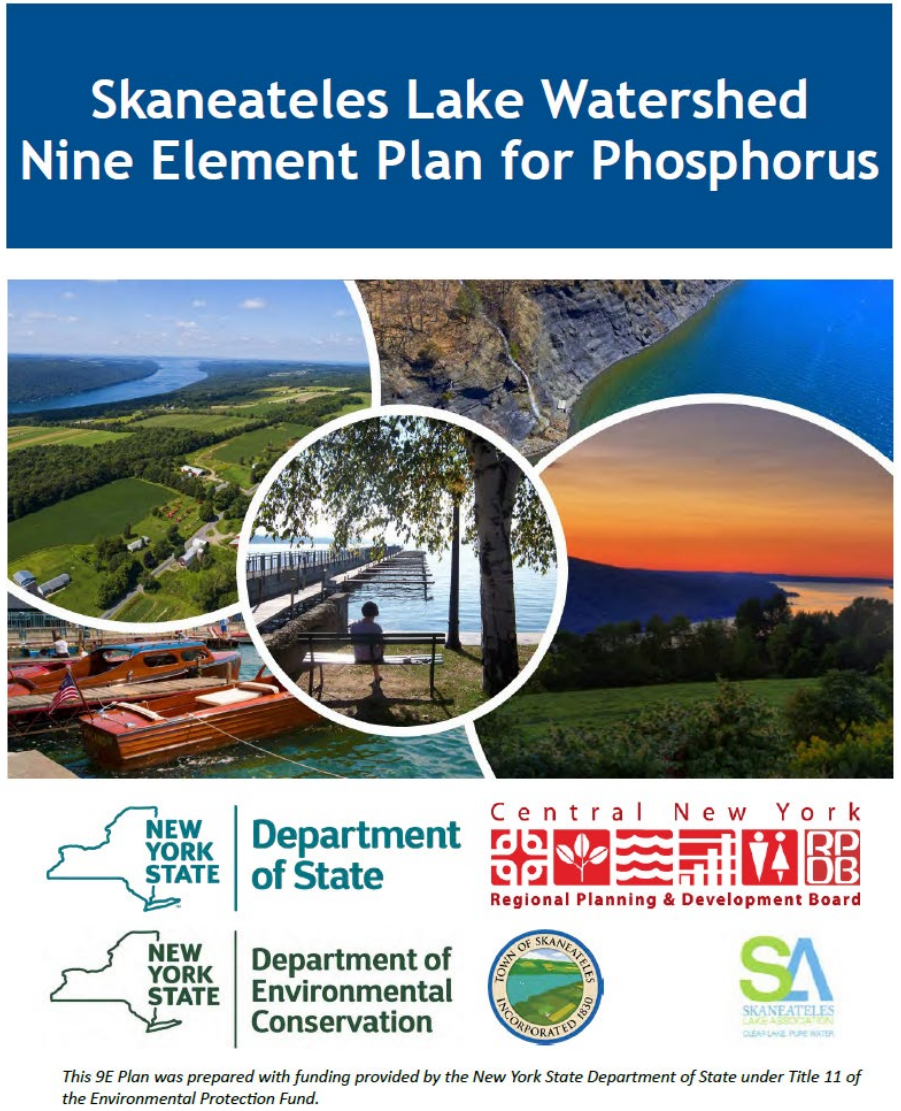
Watershed Planning is (often): figuring out which BMPs to focus on in a watershed to get a water body's nutrient levels to a "desirable" level, usually with the goal of reducing HABs or keeping them in check

Table 5.3 – Additional BMPs to be implemented within the watershed to achieve the Vision and Goals

BMP Description	Lead Organizations and Partners	Potential Funding Sources	Estimated Cost	Priority	Currently being implemented?
STORMWATER & LOCAL LAND USE					
Continued AEM Tier 3A Adoption: Continue to implement AEM Tier 3A Plans for crop farmers and Nutrient Management Plans (NMPs) for livestock operations	SWCDs and SLWAP	NYSAGM	Varies from farm to farm	High Priority (1 – 5 years, ongoing)	Yes
Crop Residue Mulching: Encourage crop residue mulching on row crop lands	SWCDs and SLWAP	NYSAGM	Low Cost / No Cost[1]	High Priority (1 – 5 years, ongoing)	Yes
Conservation Reserve Enhancement Program (CREP): Producers enrolled in CREP remove lands from agricultural production and plant native grasses, trees, and other vegetation to improve water quality, soil, and wildlife habitat, in exchange for financial incentives	SWCDs and SLWAP	USDA, City of Syracuse	$900,000 (total) has been committed by the USDA and the City of Syracuse	High Priority (1 – 5 years, ongoing)	Yes
Eastern Finger Lakes: Form a coalition of Soil and Water Conservation Districts and explore funding opportunities	DEC, SWCDs	DEC	$42 million	Complete / In Progress	No
Enhance Natural Lands: Enhance and protect the economic, social, and health benefits of natural resources (through trail construction, habitat enhancements, trailhead development, etc.)	Land Trusts, DEC, DOS, SWCDs	Land Trusts, DEC, DOS, SWCDs, NRCS	$50,000 - $250,000	Low Priority (10 years +)	No

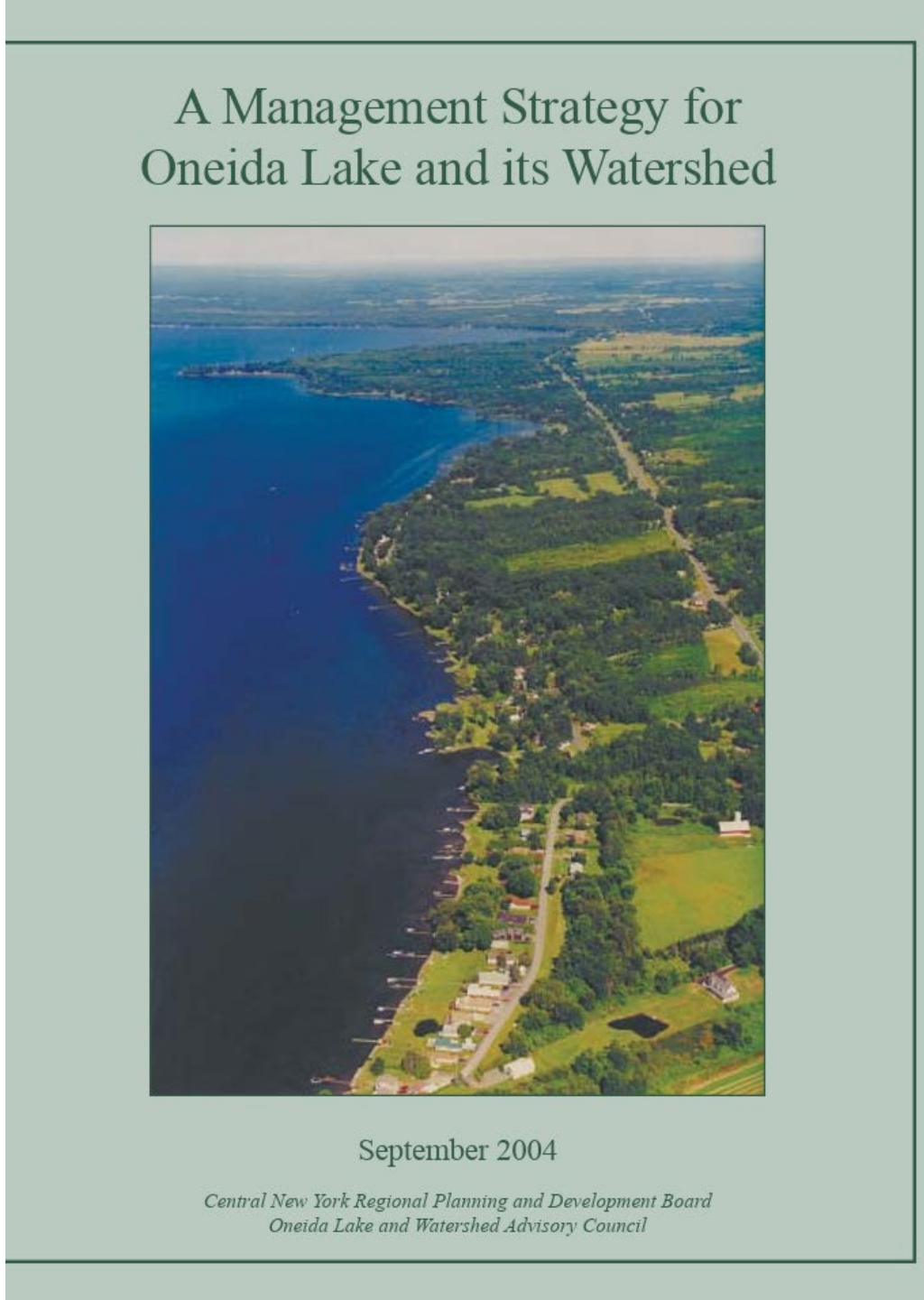
Which CNY water bodies have watershed plans?

- Skaneateles (9E – Phosphorus)
- Otisco – Watershed Plan
- Owasco (9E – Phosphorus)
- Cayuga (TMDL - Phosphorus)
- Cazenovia Lake
- DeRuyter (9E - Phosphorus)
- Onondaga (TMDL - Phosphorus)
- Lake Ontario (TMDL for PCB)
- Little Sodus Bay (TMDL - Phosphorus)
- Sandy Ponds – Watershed Plan
- Sandy Creeks 9E – in progress
- Lake Neatahwanta – Work Plan / Reclamation Project
- Sterling & Wolcott Creeks – Integrated Watershed Action Plan
- Oneida Lake Watershed Management Plan (9E in progress)



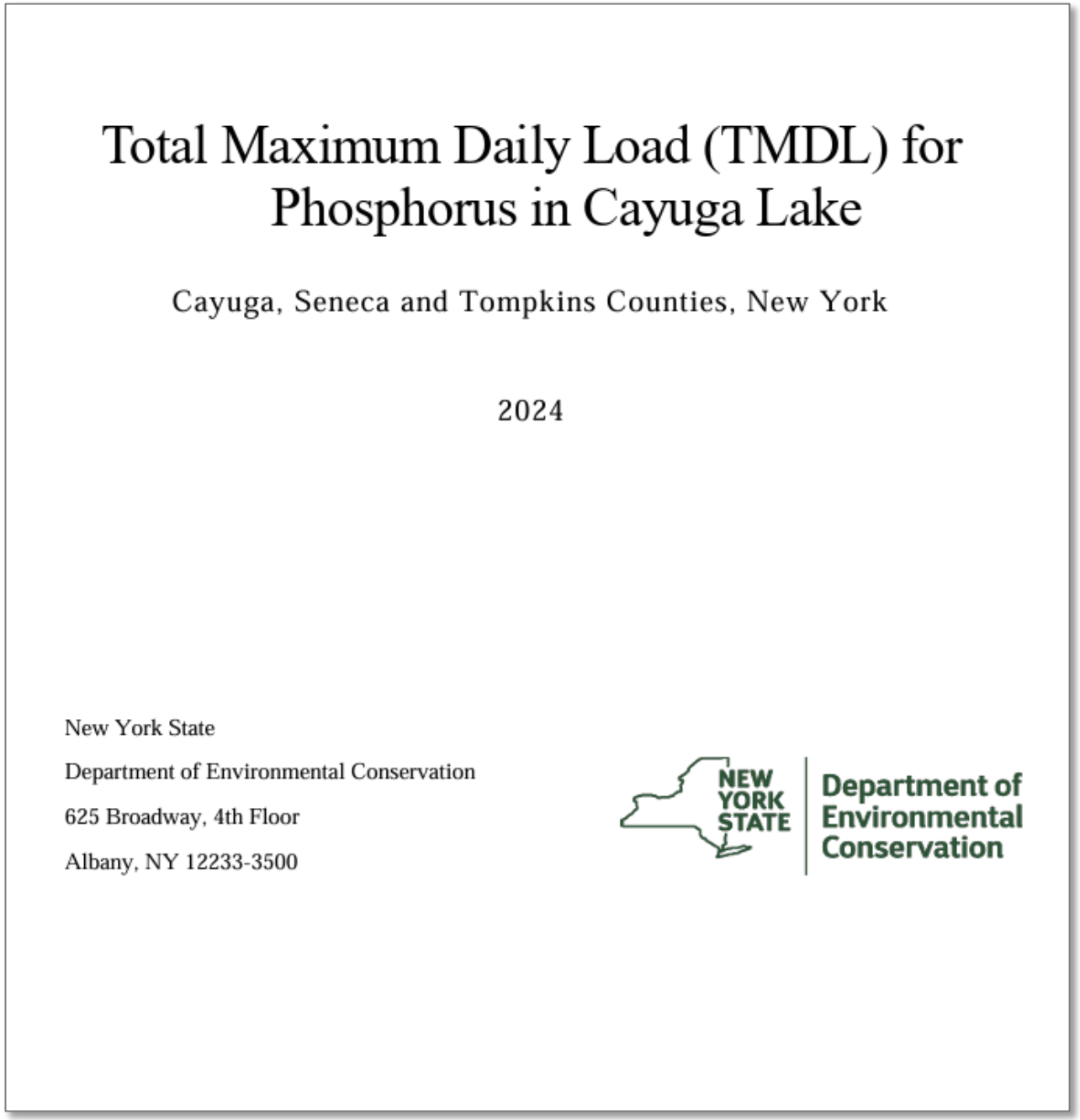
Three “levels” of planning

- **Watershed Plan**
  - Similar to a comprehensive plan: work with a steering committee to develop goals and action items to achieve a set of goals for the lake and watershed.
    - Non-regulatory
    - May or may not use quantifiable metrics



Three “levels” of planning

- **Total Maximum Daily Limit (TMDL)**
  - Comes from the federal Clean Water Act
  - Regulatory
  - Prepared by DEC
  - Grounded in a quantitative analysis that identifies the maximum amount of a pollutant a body of water can receive while still meeting water quality standards
  - What BMPs do we need to implement to get P levels where we want them?


Total Maximum Daily Load (TMDL) for Phosphorus in Cayuga Lake

Cayuga, Seneca and Tompkins Counties, New York

2024

New York State

Department of Environmental Conservation

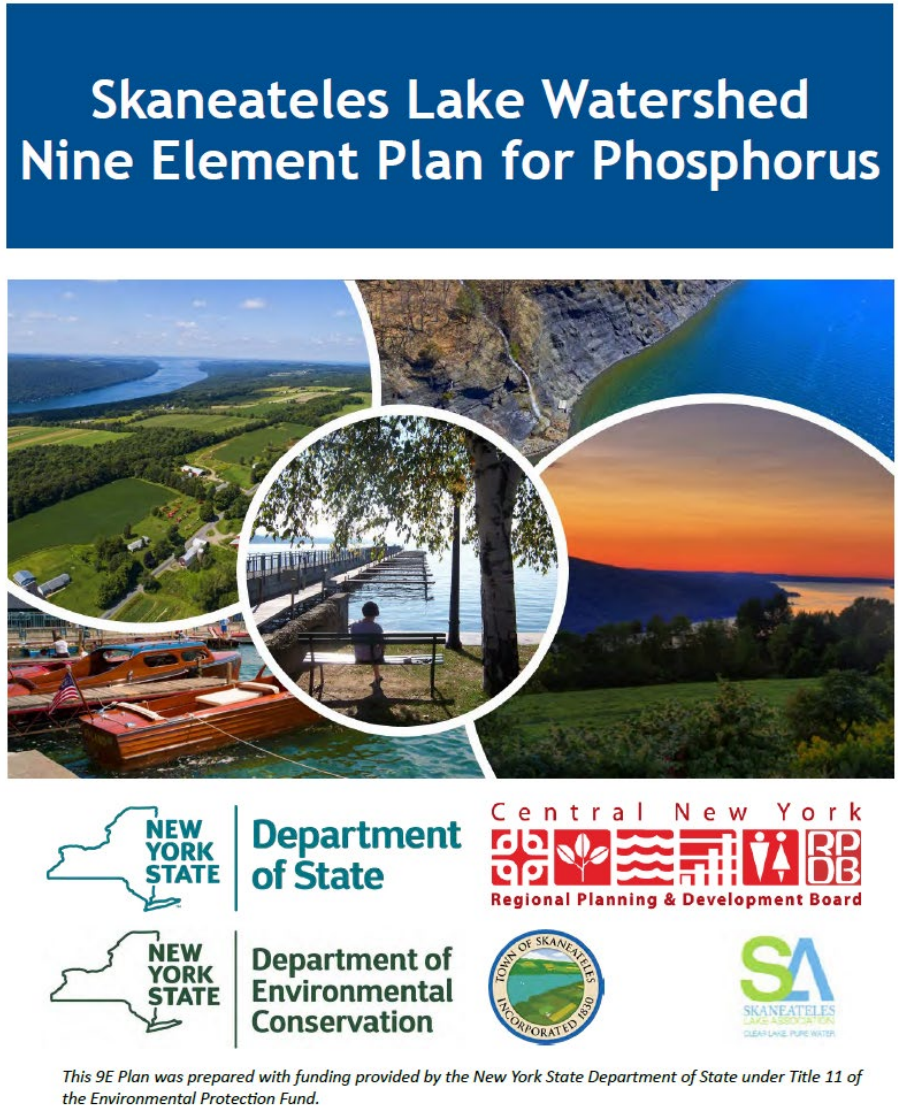
625 Broadway, 4th Floor

Albany, NY 12233-3500

NEW YORK STATE | Department of Environmental Conservation

Three “levels” of planning

- **Nine Element Plan**
  - Cross between a watershed plan and a TMDL
  - Like a watershed plan:
    - Non-Regulatory
    - Prepared by local stakeholders
  - Like a TMDL:
    - Grounded in a quantitative analysis that identifies a numerical “target” and uses modeling to determine whether or not a set of BMPs will get the lake to that target
  - In the case of Skaneateles Lake: “hold the line” in the face of climate change
    - Keep P levels where they are: **4.5 ug/l**



Why do we need watershed plans?

- Most watersheds cross town and/or county lines
    - Skaneateles Lake Watershed includes parts of three counties, seven towns, and one village
- There are typically many stakeholders working within a watershed
    - Are their efforts coordinated in any way?
- Funds are available from State and Federal partners, but is there an agreed upon set of priorities?

Skaneateles Lake Watershed Plan: Watershed Advisory Committee

- Cayuga County Department of Planning and Economic Development
- Cayuga County Soil and Water Conservation District
- Cortland County Soil and Water Conservation District
- City of Syracuse
- Central New York Land Trust (CNY Land Trust)
- Cornell Cooperative Extension (CCE)
- Cortland County Soil and Water Conservation District (SWCD)
- Finger Lakes Land Trust (FLLT)
- Onondaga County Office of the Environment
- Onondaga County Department of Planning
- Onondaga County Legislature
- Onondaga County Soil & Water Conservation District (SWCD)
- Skaneateles Lake Association (SLA)
- Skaneateles Lake Watershed Agricultural Program (SLWAP)
- The Nature Conservancy
- Town of Niles
- Town of Scott
- Town of Sempronius
- Town of Skaneateles
- Town of Spafford
- Village of Skaneateles

Recommendations - Examples

Short-term (next 5 years)

- Seek out opportunities for tree planting in the Skaneateles Watershed, particularly along the lake's shoreline and in riparian corridors
- Continue to advertise and implement the Environmental Facilities Corporation's Septic System Replacement Program

Recommendations - Examples

Mid-term (5 – 10 years)

- Invest in projects to increase upland stormwater retention through the implementation of water storage BMPs (retention basins, wetlands, etc.)
- Work with municipal and State partners to evaluate and, as necessary, upgrade culverts and roadside ditches to reduce nutrient and other pollutant loading.

Onondaga County SWCD's Shotwell Brook Constructed Wetland Project

Recommendations - Examples

Long-term (10 – 15 years)

- Continue to work with municipal and State partners to reduce road impacts on waterways, including erosion and drainage issues.
- Support research, testing, and adoption of pilot projects using enhanced phosphorus removal technologies in septic systems.
- Evaluate the feasibility of using anaerobic digesters in the Skaneateles Watershed.

Implementation Plan

- CNY RPDB is taking a role in plan implementation
- The Watershed Advisory Committee members are now the Implementation Team
  - Plus SUNY ESF
- Our role:
  - Convene quarterly meetings
  - Track BMP implementation
  - Pursue grant funding in conjunction with partners
  - Develop projects
    - Applied for and received funds for a streambank project on Winding Way with Onondaga County and the SLA