

# **Wetlands at Risk**

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Sierra Club Atlantic Chapter  
May 2005**

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# Introduction

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## Overview

Wetlands are vital ecosystems that maintain clean water, prevent flooding and provide critical habitat for wildlife. Yet, many of New York's wetlands are threatened by development projects. To protect wetlands our communities rely on overlapping local, state, and federal regulatory programs. However, since 2001 the federal government has reduced the scope of its regulatory program. This change has raised questions about the effectiveness of New York's Freshwater Wetlands Program. This report studied the scope of the state's Freshwater Wetlands Program in relation to overall protection of wetlands in New York State.

## Executive Summary

The Sierra Club Atlantic Chapter analyzed New York State wetlands maps and United States Fish and Wildlife Service maps to explore the status of New York's wetlands and the scope of state-level protections.

The report evaluated the scope of the state program by comparing the number of wetlands in the state determined by US Fish and Wildlife Service (USFWS) wetland maps with the number of wetlands regulated by the state, drawn from the New York Fresh Water Wetlands Map Statistics.<sup>1</sup> Our analysis is limited by differences in the mapping process between the two maps, and unmapped areas. Thus, the report findings are intended to be suggestive rather than exact. In addition, the report focuses on number of wetlands instead of wetland acreage, which has both advantages and limitations for analysis. Please see the findings section for a more detailed discussion of these limitations.

## **Findings include:**

- DEC reports that it regulates 15,625 wetlands in the state and USFWS maps show 281,216 palustrine wetlands in the state. **Thus the state may be regulating as few as 6% of total number of freshwater wetlands in New York.** Total regulated acreage would be significantly higher.
- USFWS maps show some wetlands that meet size criteria under the state law for inclusion on the state maps, but do not appear on state maps. Even if these wetlands meet all other substantive criteria in the state law, the DEC would be unable to regulate activities in these wetlands. **In this way the map requirement limits the DEC's authority to protect the values and functions that wetlands perform.**

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<sup>1</sup> <http://www.dec.state.ny.us/website/dfwmr/habitat/wetstats.pdf>

# **Background**

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## **Value of Wetlands**

Wetlands are vital ecosystems that rely on a constant or regular saturation of water. Also known as marshes, swamps, and bogs they provide a variety of critical functions depending on geographical location, size, and type.

**Maintain Clean Water.** Wetlands act as natural filters to maintain clean water in our reservoirs, rivers, lakes and streams. As water flows through wetlands microorganisms break down and use nutrients reducing the levels of pollutants. Likewise, chemical processes in the soil trap chemicals and heavy metals.

**Recharge Groundwater and Aquifers.** Wetlands trap and store water that slowly percolates into the ground, replenishing aquifers that serve both private and municipal water systems. Thus, wetlands are critical for rural and unserved parts of the state where residents rely on groundwater from wells for their homes, farms and businesses.

**Prevent Flooding and Control Sediment and Erosion.** Wetlands provide an important buffer and protect structures from flooding because they effectively store run-off from rain and snowmelt. **One acre of wetlands stores up to 1.5 million gallons of flood water.**<sup>2</sup> Flood damage connected to wetlands destruction costs millions of dollars. Wetlands preservation can be the most cost-effective form of stormwater control. For example, the New York City Department of Environmental Protection (DEP) found that they could save million in costly sewer infrastructure by preserving wetlands in the South Richmond area of Staten Island.<sup>3</sup>

**Habitat for wildlife.** Healthy wetlands are biologically productive ecosystems. They provide habitat and cover to wildlife and fish species for breeding, feeding, and nesting. **More than one-third of the United States' threatened and endangered species live only in wetlands, and nearly half use wetlands at some point in their lives.**<sup>4</sup> Many animals like wood ducks and muskrats can only live in wetlands. For others like the striped bass, peregrine falcon, otter, black bear, raccoon, and deer wetlands provide important food, water and shelter. Many of the U.S. breeding bird populations including ducks, geese, woodpeckers, hawks, and song birds feed, nest, and raise their young in wetlands.<sup>5</sup> In addition, wetlands provide habitat to thousands of plant species in New York. One half of New York's protected native plants, many of which are endangered or threatened, are wetlands species.<sup>6</sup>

**Recreation.** Wetlands provide wonderful recreational opportunities. Hunters, anglers, hikers, and boaters all benefit from wetlands. Our state relies on revenue from these

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<sup>2</sup> <http://www.sierraclub.org/wetlands>, February 14, 2005

<sup>3</sup> <http://www.nyc.gov/html/dep/html/news/bluebelt.html>, November 22, 2004

<sup>4</sup> <http://www.epa.gov/OWOW/wetlands/vital/people.html>, November 22, 2004

<sup>5</sup> <http://www.epa.gov/OWOW/wetlands/vital/people.html>, November 22, 2004

<sup>6</sup> <http://www.dec.state.ny.us/website/dfwmr/habitat/fwwprog2.htm>, February, 25, 2005

recreational activities. More than half of all U.S. adults hunt, fish, birdwatch, or photograph wildlife. Together they spend \$59.5 billion annually.<sup>7</sup> **Over 12 million New Yorkers hike, birdwatch, hunt, fish, trap, boat, photograph nature, or camp annually.** A 1991 report to the legislature estimated that these activities had an annual net worth of \$5 million.

**Preservation of Natural Areas.** Protected wetlands provide undeveloped natural areas in our cities and suburbs.

### **Value of Smaller Wetlands**

Smaller wetlands, such as vernal pools, provide their own unique values. Vernal pools are seasonal bodies of water that attain maximum depths in spring or fall, and lack permanent surface water connections with other wetlands or water bodies. Small wetlands and vernal pools contribute significantly to local biodiversity by supporting an abundance of plants, invertebrates, and vertebrates that would otherwise not occur in the landscape. For example, the average travel distance for frogs, salamanders, and small mammals is less than .3 km. The destruction of small wetlands in the landscape increases the distances between remaining wetlands. Often, these distances are greater than these animals can travel. Many threatened and endangered species rely on small wetlands for breeding grounds including the tiger salamander (endangered), the blue-spotted salamander, jefferson salamander, marbled salamander, and spadefoot toad (of special concern). Other threatened or endangered species use vernal pools for resting and foraging including the cricket frog (endangered), spotted turtle, eastern box turtle, and eastern hognose snake (of special concern), and the blanding's turtle (threatened).<sup>8</sup>

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<sup>7</sup> <http://www.epa.gov/OWOW/wetlands/vital/people.html>, November 22, 2004

<sup>8</sup> p.5, Calhoun, Aram J.K., Michael W. Klemens, "Best Development Practices: Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States." 2002. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York.

## **Regulatory Climate**

To protect wetlands, our communities rely on overlapping local, state, and federal regulatory programs.

### **State Program**

New York State's Freshwater Wetlands Program is established through New York's Freshwater Wetlands Act, Article 24, of the Environmental Conservation Law. Through this act New York seeks to "preserve, protect and conserve freshwater wetlands and the benefits derived therefrom, to prevent the despoliation and destruction of freshwater wetlands, and to regulate use and development of such wetlands" (NYS 24-0103).

**Under this act a freshwater wetlands is considered a wetlands if it supports aquatic or semi-aquatic vegetation delineated in the act and is on the state wetlands map.** This vegetation includes the red maple, American elm, cattails, wild rice, and bog rosemary. In addition, the wetlands must be 12.4 acres or above or of "unusual local significance." Inside the Adirondack Park, the Adirondack Park Agency has additional jurisdiction over wetlands under Executive Law authority. The APA protects all wetlands over one acre in size, and smaller wetlands if they are associated with permanent open water.

To put a wetland on the state wetland map, the state must hold public hearings and notify the public and affected landowners. Once a wetland is on the state wetlands map any activities such as dredging, filling, or construction, within a 100 foot buffer of the wetlands require a permit. Certain activities are exempted including commercial and recreational fishing, hunting, and trapping, agriculture, grazing livestock, and public health activities. Any decision can be appealed to the Freshwater Wetlands Appeals Board. Local governments may adopt their own wetlands regulations.

### **Local Regulation**

Many municipalities have adopted local wetland regulations more protective than state law. The regulations may include: a reduced size threshold for jurisdiction; an increased buffer zone; expanded criteria to determine wetland status; and more protective limitations on permissible activities.

For example, the town of Lewisboro in Westchester County asserts jurisdiction over wetlands regardless of size and regulates activities within a 150 foot buffer of the wetland (Chapter 217, Lewisboro Town Code). Unlike the state government, the town regulates agricultural activities that include draining a wetland and prohibits deposit or fill consisting of construction and demolition materials, asphalt or other materials within a wetland, watercourse or buffer area.

### **Federal Program**

The Federal Government derives the authority to regulate wetlands through The Clean Water Act of 1972, which set the basic structure for regulating discharges of pollutants to waters of the United States. Section 404 of the Clean Water Act establishes

a program to regulate the discharge of dredged and fill material into waters of the United States, including wetlands. The Army Corp of Engineers (Corp) administers this program. Until 2001, the Army Corp of Engineers had been regulating virtually all wetlands using the Corp's 1987 Wetland Delineation Manual.<sup>9</sup> According to this manual, the federal government had jurisdiction over wetlands that were: adjacent to coastal and inland waters, lakes, rivers, and streams that are navigable waters of the United States; adjacent to tributaries to navigable waters of the United States; adjacent to interstate waters and their tributaries; all others waters of the United States not identified above, such as isolated wetlands and lakes, intermittent streams, prairie potholes, and other waters that are not a part of a tributary system to interstate waters or navigable waters of the United States, the degradation or destruction of which could affect interstate commerce.<sup>10</sup>

The federal government defines wetlands as, "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."<sup>11</sup> The Corp uses vegetation, hydrology, and soil to identify wetlands.

If the Corp asserts federal jurisdiction over a wetland area, activities impacting that wetland require a permit from the Corp. These activities include: depositing of fill or dredged material in waters of the U.S. or adjacent wetlands; site development fill for residential, commercial, or recreational developments; construction of revetments, groins, breakwaters, levees, dams, dikes, and weirs; placement of riprap and road fills.<sup>12</sup>

In 2001, in the *Solid Waste Authority of Northern Cook County v. US*, the Supreme Court struck down one of the criteria the federal government had used to assert jurisdiction over wetlands. Among the other criteria, the Corp had been asserting jurisdiction over wetlands due to their use by migratory birds protected by international treaties. In response to this case, the federal government decided to only assert jurisdiction over wetlands that are connected via surface water to water of the U.S., defined as tidal, navigable, or interstate waters. Thus, the federal government no longer regulates activities impacting "isolated wetlands."

There have been vast discrepancies between regional Corp offices in implementing this jurisdictional limitation. A February 2004 report by the General Accounting Office (GAO) found that Corps districts differ in how they interpret and apply the federal regulations when determining which waters and wetlands are subject to federal jurisdiction. The federal regulations leave room for interpretation by Corps districts when considering (1) adjacent wetlands, (2) tributaries, and (3) ditches and other man-

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<sup>9</sup> The 1987 Wetlands Delineation Manual can be downloaded from <http://www.usace.army.mil/public.html#Environmental>.

<sup>10</sup> p. 20, Corp of Engineers Wetlands Delineation Manual

<sup>11</sup> p.21, Corp of Engineers Wetlands Delineation Manual

<sup>12</sup> <http://www.sac.usace.army.mil/permits/rpp-bro.html>, February 25, 2005

made conveyances. For example, the report found that one district generally regulates wetlands located within 200 feet of other jurisdictional waters, while other districts consider the proximity of wetlands to other jurisdictional waters without any reference to a specific linear distance.

A 2004 survey by the Natural Resource Defense Council (NRDC) found discrepancies between the New York and Buffalo Army Corp of Engineer offices in issuing determinations of non-jurisdiction. The New York office issued determinations of non-jurisdiction for approximately 25% of inquiries while the Buffalo office issued determinations of non-jurisdiction approximately 50% of the time. Together these offices have determined that wetlands were not subject to federal protect 308 times in New York State since 2001.

### **Comparison of State and Federal Programs**

There are critical differences in the scope and protectiveness of the two programs. In some ways the federal program is less stringent than the state program. For example, the federal program allows activities that have impacts that fall below certain thresholds to occur with no regulatory oversight. For instance, the Army Corps of Engineers nationwide permit number 29 for construction of single family houses allows activities that will result in the loss of less than 1/4 acre of wetland without a permit, or even notification of the Corps. Under the federal program the party harming the wetland determines if they have complied with the requirements of the law and when they need to apply for a permit. The federal regulators can only tell if the law is being violated by going on the site and measuring the impact. Due to limited personnel to carry out this kind of oversight, it would be difficult to tell if compliance with the nationwide permits is common, or is the exception to the rule. For wetlands under state regulation there is no similar threshold for action, if the activity affects the wetland, a permit is required.

In another critical difference, the Corps' regulatory authority ends at the boundary of the wetland. This threatens wetlands since alterations to areas adjacent to wetlands can negatively affect the viability of the wetland. In contrast, New York's program regulates 100 foot buffer around the wetland. If activities in the wetland buffer are minimized and mitigated, the wetland in question is much more likely to continue to provide the flood prevention, water purification and habitat functions in the aftermath of development than a wetland where development has occurred right up to wetland boundary. Also, as wetlands change over time they sometimes get larger as the result of poor stormwater management and increased impervious surfaces in our watershed. Wetlands can begin to encroach into areas that have been developed adjacent to but outside the historical wetlands. Buffers help protect people from the wetland. These differences make the state program more protective.

Since the DEC, unlike Corps, has to map wetlands prior to asserting regulatory authority, wetlands will be missed in the mapping process and fall through the cracks.

## **The Status of New York's Wetlands**

The U.S. Geological Survey estimates that New York State has lost 50% of the wetlands that existed historically.<sup>13</sup> US EPA offers an even bleaker picture holding that the state has lost an estimated 60% of its historic wetlands.<sup>14</sup> Given the importance of wetlands for maintaining water quality, with the loss of a significant portion of the state's wetlands, we would expect to see wide spread degradation of water quality and aquatic habitat. That is in fact what we are seeing in New York.

New York's 2002 filing of impaired waters with the EPA lists 187 waters that are impaired by pathogens, nutrients or sedimentation - impairments that are indicative of unhealthy watersheds and impairments that wetlands help to prevent.<sup>15</sup> According to a report issued by the New York City Watershed Inspector General, all of New York City's 19 reservoirs have been listed as stressed, threatened, or impaired due to phosphorus - a non-point source pollutant.<sup>16</sup> Research conducted by Trout Unlimited in the Beaverkill/Willowemoc watershed, credited with being the birthplace of flyfishing in the United States, shows that these river systems are so heavily impacted by stormwater runoff, their productivity as cold-water fisheries has been threatened.<sup>17</sup>

A DEC study from the mid '90s evaluated wetlands status in different regions of the state.<sup>18</sup> This study found that in some portions of the state there was an increase in wetlands acreage. In Western New York, Central New York, and in the Adirondacks there was a net increase of 18,300 acres of wetlands. According to the DEC these increases were primarily due to increased run-off land going out of agricultural production. In the Hudson Valley there was a net loss of 2,900 acres of wetland. According to the DEC, the leading cause of wetland losses in the state was "urbanization," or development.

An increase in wetland acreage is good news. It is clear from the DEC study that economic trends in the state are primarily responsible for this .6% increase in wetland acreage. As lands that were previously drained and cultivated for agriculture go out of production wetlands return. In areas, like the Hudson Valley, that are undergoing rapid development wetlands are lost.

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<sup>13</sup> Dahl, Thomas E. 1990. Wetlands losses in the United States 1780's to 1980's. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Home Page. <http://www.npwrc.usgs.gov/resource/othrdata/wetloss/wetloss.htm> (Version 16JUL97).

<sup>14</sup> EPA 843-F-01-002d, September 2001.

<sup>15</sup> [http://oaspub.epa.gov/waters/state\\_rept\\_control?p\\_state=NY#IMP](http://oaspub.epa.gov/waters/state_rept_control?p_state=NY#IMP)

<sup>16</sup> Tierney, James M. 1999. The Regulation and Protection of Wetlands Within the New York City Watershed: A Report for Policy-Makers and Concerned Citizens. Office of the New York State Attorney General, Environmental Protection Bureau.

<sup>17</sup> Conyham, Jock and Nathaniel Gillespie, 2003, Trout Unlimited's Beaverkill-Willowemoc Assessment 1994-2002: An Assessment of Trout Habitat Using Hydrology and Applied Fluvial Geomorphology.

<sup>18</sup> <http://www.dec.state.ny.us/website/dfwmr/habitat/fwwprog3.htm>

## **Research Question**

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The Sierra Club Atlantic Chapter analyzed New York State wetlands maps and United States Fish and Wildlife Service maps to explore the status of New York's wetlands and the scope of state-level protections.

### **This project had the purpose of:**

- Developing an interactive set of GIS overages for New York State, for use in comparing wetlands in US Fish and Wildlife Service (USFWS) database to NY State Department of Environmental Conservation (DEC) protected wetlands.
- Determining the number of “at-risk” wetlands in New York State.

### **Limitations of the Analysis**

Unfortunately, the USFWS has not completely mapped New York State. Gaps in maps include the Adirondack Park and portions of the Hudson Valley, Central New York and Western New York. New York's Freshwater Wetland Maps also do not include the Adirondack Park. Wetlands in the Adirondack Park are regulated by the Adirondack Park Agency and are not mapped. These limits in the data mean that the reports findings are suggestive rather than exact.

Differences in the mapping processes used by USFWS and the New York State Department of Environmental Conservation (DEC) introduce additional uncertainty in the analysis. The USFWS maps may count wetlands that are separated by roads, waterbodies, or other barriers as two wetlands while the state maps would probably combine these wetlands into one. Leaving aside the question of which process is more accurate, the differences between the two approaches means that the USFWS would tend to overcount wetlands relative to the DEC. Therefore the report's estimate of the percentage of state wetlands regulated by DEC may be too small. However, the fact that the USFWS maps for the state are not complete means that wetlands from significant portions of the state could not be included. This factor may somewhat mitigate the problem of overcounting.

Finally, this report looked at numbers of wetlands regulated, not wetland acreage or any of a number of other important characteristics of wetlands. The Sierra Club believes that these other characteristics that could be measured are important but it was beyond the scope of this report to evaluate them. Focusing on the number of wetlands can overestimate the importance of individual wetlands. For example, assume that there are four wetlands with a total size of one acre and that one of those wetlands, measuring 1/10 of an acre, is filled. By only looking at the number of wetlands preserved or damaged you would find that 1/4 of your wetland resource was lost. However, focusing on acreage can mask the importance of smaller wetlands. For instance, some watersheds may only contain smaller wetlands. Filling all of the wetlands in this watershed could significantly harm water quality and habitat but the loss of acreage would be miniscule compared to the total acreage of wetlands in the state. Since the wetlands affected by the changes in the federal wetland protection program tend to be smaller, this report chose to evaluate numbers of wetlands.

## Findings

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### Limited Protection

The US Fish and Wildlife Service maps identify over 305,316 wetlands in New York State. Since the Northeastern portion of the state, including the counties making up the Adirondack Park, have not yet been mapped by the US Fish and Wildlife Service this figure is low. These wetlands are divided into four classifications estuarine, riverine, lacustrine and palustrine, the most common being palustrine. The palustrine category encompasses non-tidal vegetated freshwater wetlands commonly referred to as bogs, swamps, fens, and marshes.<sup>19</sup>

Our study analyzed the state's palustrine wetland by size. Of the 281,216 total palustrine wetlands only 646 meet the 12.4 acre size threshold for state protection. **Thus, analysis of USFWS data shows that only 0.2% of palustrine wetlands in New York State meet the size threshold for state protection.** As the chart below indicates, data in every area of the state follow a similar trend.

DEC's wetland map statistics list 15,625 regulated freshwater wetlands outside of the Adirondack Park.<sup>20</sup> **By comparing this number with the total number of palustrine wetlands mapped by the US Fish and Wildlife Service, we see that DEC may regulate as few as 6% of the total number of freshwater wetlands in New York State.** This number should be viewed as an estimate, not an exact number, due to the mapping limitations discussed above and because the palustrine category does not encompass all freshwater wetlands in New York.

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<sup>19</sup> Please see <http://www.fws.gov/policy/660fw2.html> for a complete definition of palustrine wetlands.

<sup>20</sup> <http://www.dec.state.ny.us/website/dfwmr/habitat/wetstats.pdf>, May 3, 2005

## New York's Wetlands

USFWS Quad <sup>21</sup>	Total Number of Wetlands	Palustrine Wetlands			
		Total	<1.0 acres	1.0-<12.4	>12.4
Albany	7818	7675	7206	464	5
Binghamton	47703	46540	44241	2288	11
Buffalo	16425	15812	13933	1829	50
Elmira	44026	42832	40527	2248	57
Glens Falls	16378	15892	14853	1030	9
Hartford	27041	24090	23194	888	8
Kingston	3660	2419	2256	158	5
Lake Champlain	6838	6346	5460	858	29
Newark	1670	812	802	10	0
New York	15282	5716	5503	211	2
Ogdensburg	41821	39732	34047	5496	189
Providence	783	540	536	4	0
Rochester	23492	21941	18164	3619	158
Scranton	20846	20004	18970	1018	16
Toronto	7168	7023	5416	1528	79
Utica	24323	23803	21376	2399	28
Warren*	2056	2034	1582	440	12
Williamsport	42	39	37	2	0

\*Warren Quad was not “clipped” to NY state, so the majority of the wetlands above are likely located in PA.

43560 sq ft= 1 acre

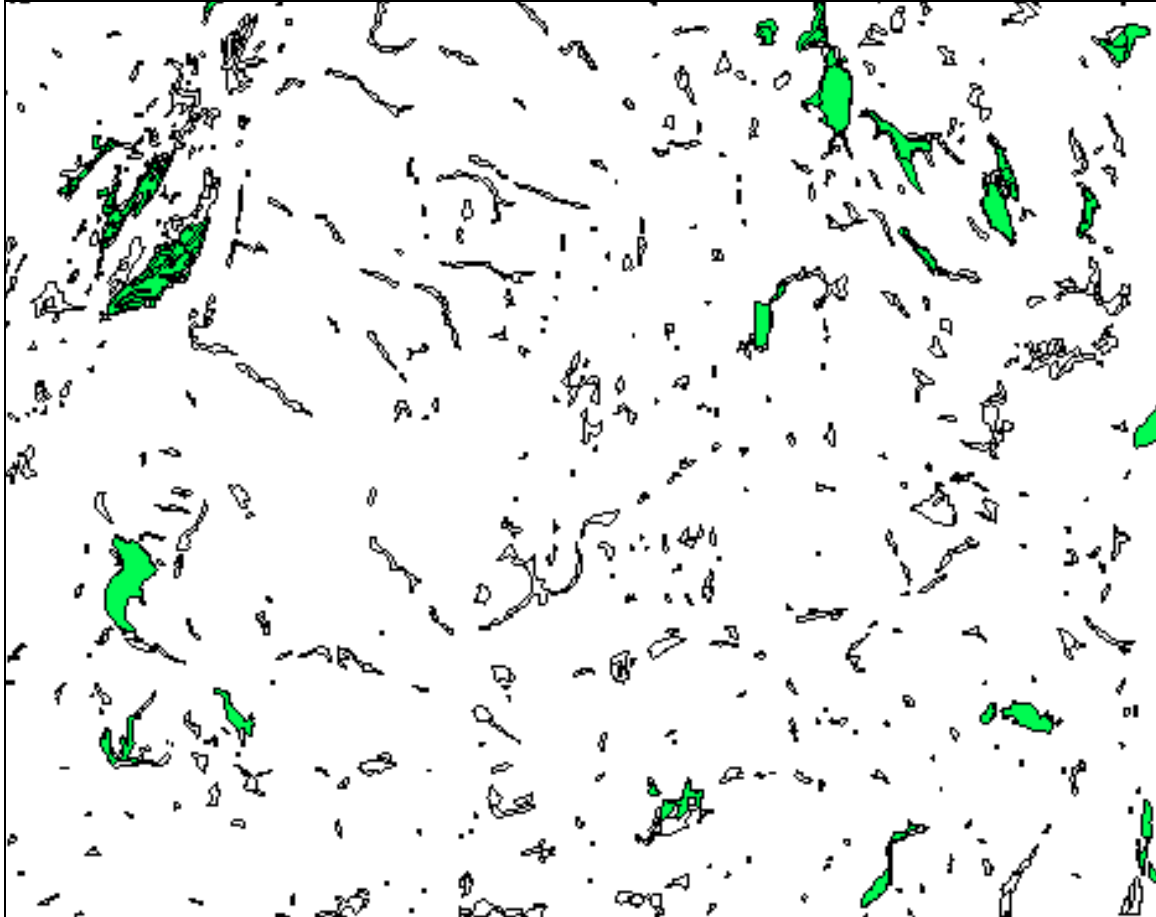
540144 sq ft = 12.4 acres



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<sup>21</sup> Please see Appendix A for a map of US Fish and Wildlife Service (USFWS) quads to show what area of the state is covered by each quad.

For example, the following maps show the contrast between DEC mapped wetlands and total palustrine wetlands in counties around the state.

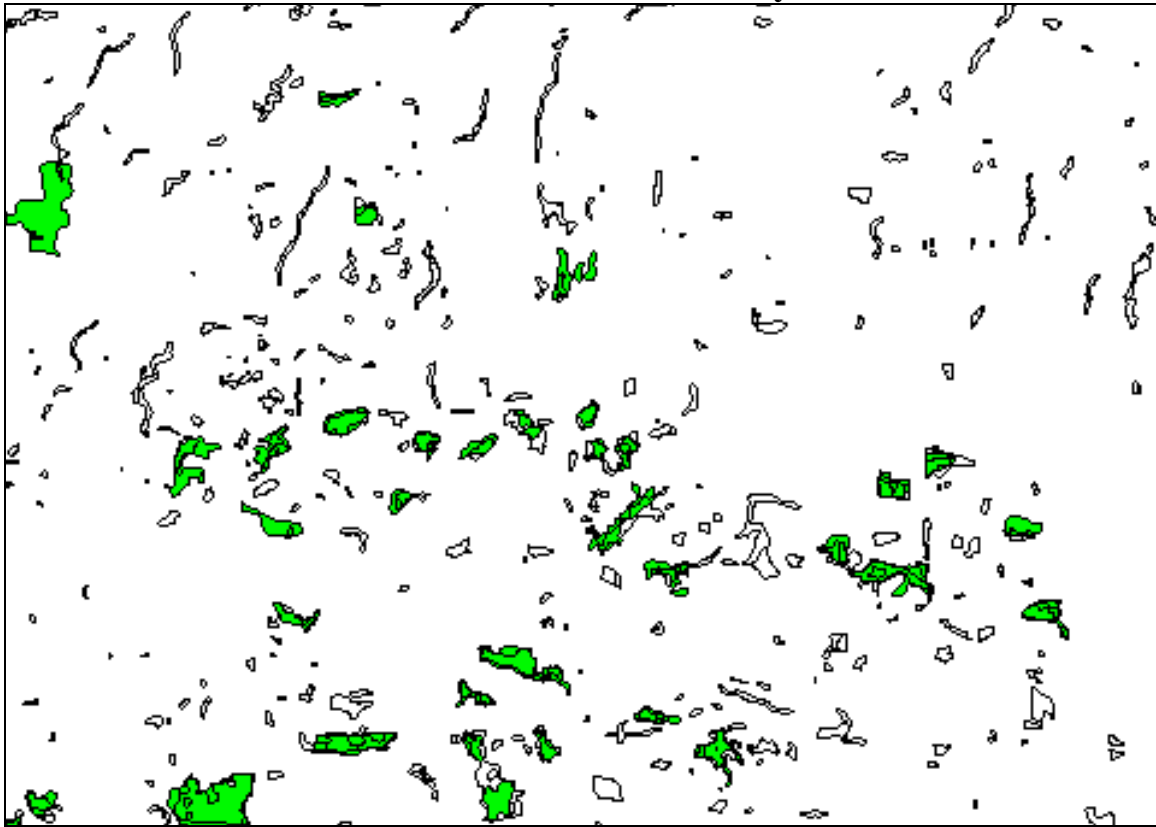
**Wetlands: Schenectady-Washington-Saratoga County Border**




Key:  Palustrine wetlands  
 DEC mapped wetlands

scale: 1 inch = .362 miles

### Wetlands: Monroe County

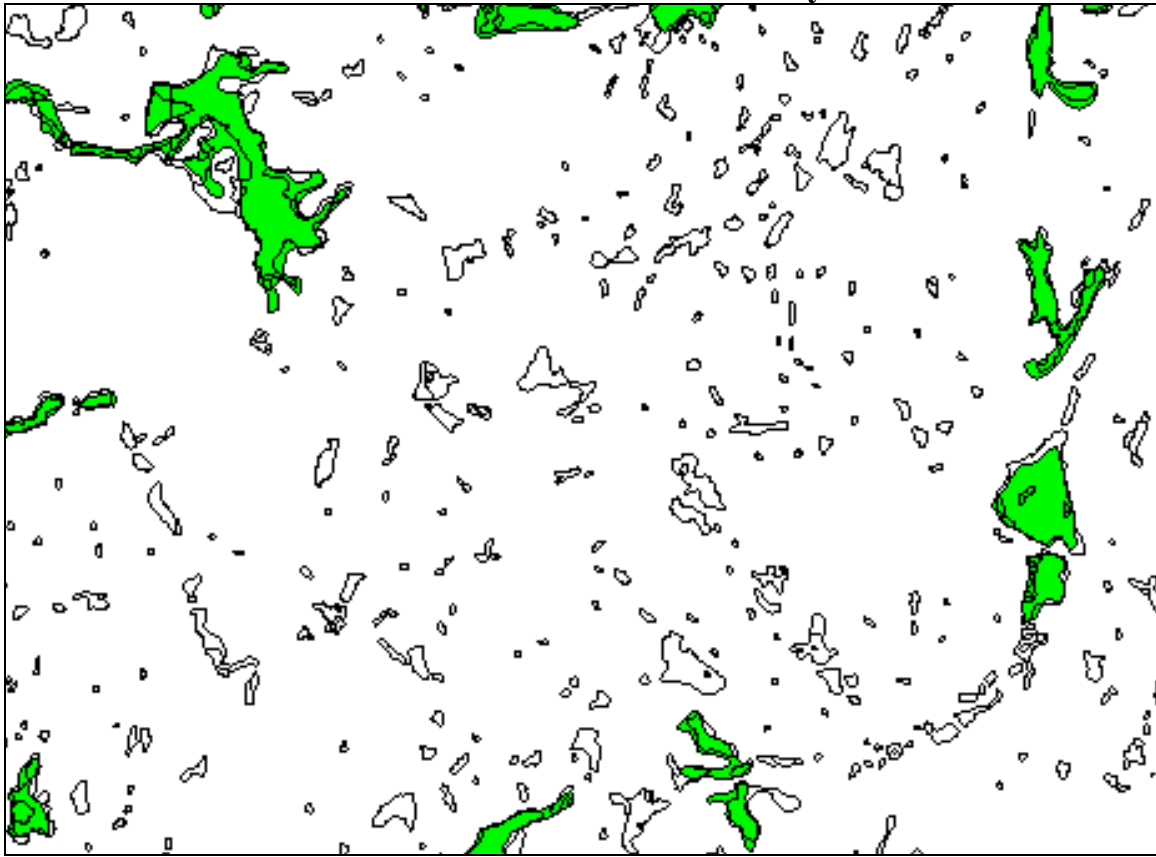



Key:  Palustrine wetlands

scale: 1 inch = .403 miles

 DEC mapped wetlands

### Wetlands: Westchester County

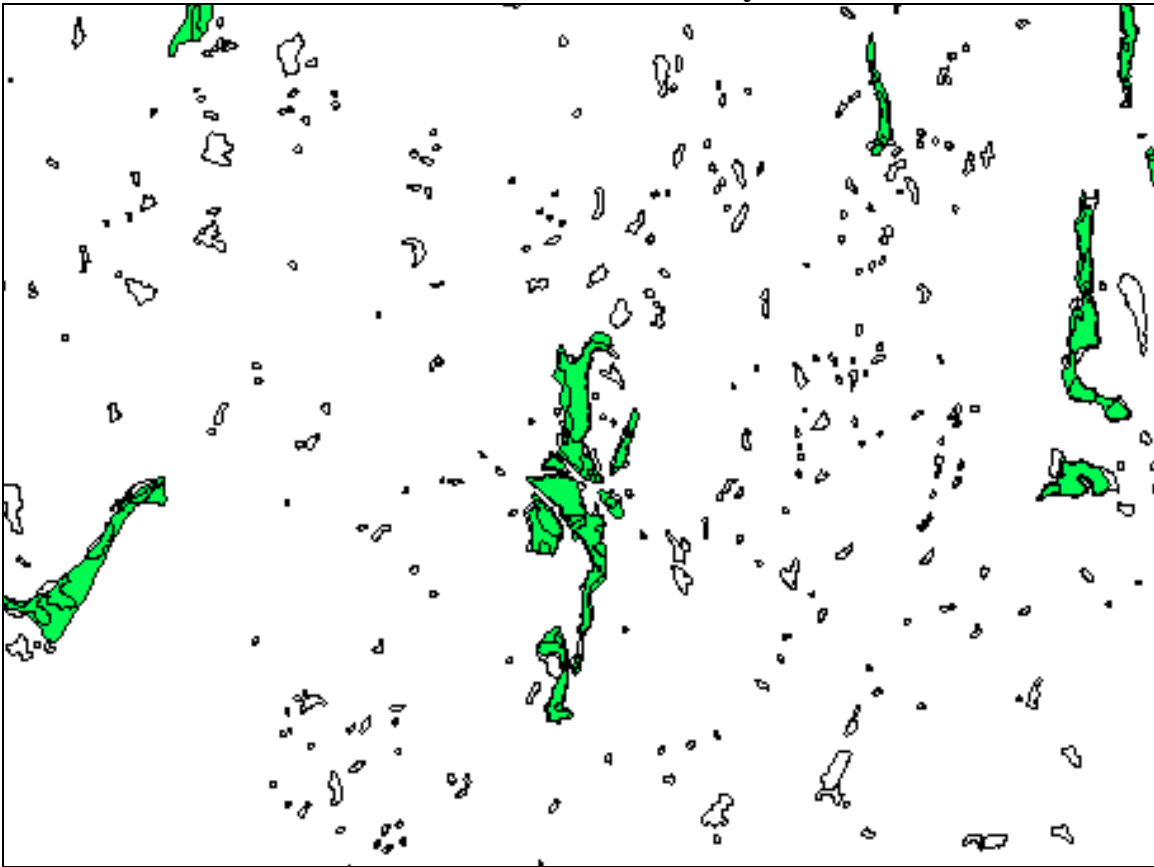


Key:  Palustrine wetlands


scale: 1 inch = .174 miles

 DEC mapped wetlands

### Wetlands: Erie County



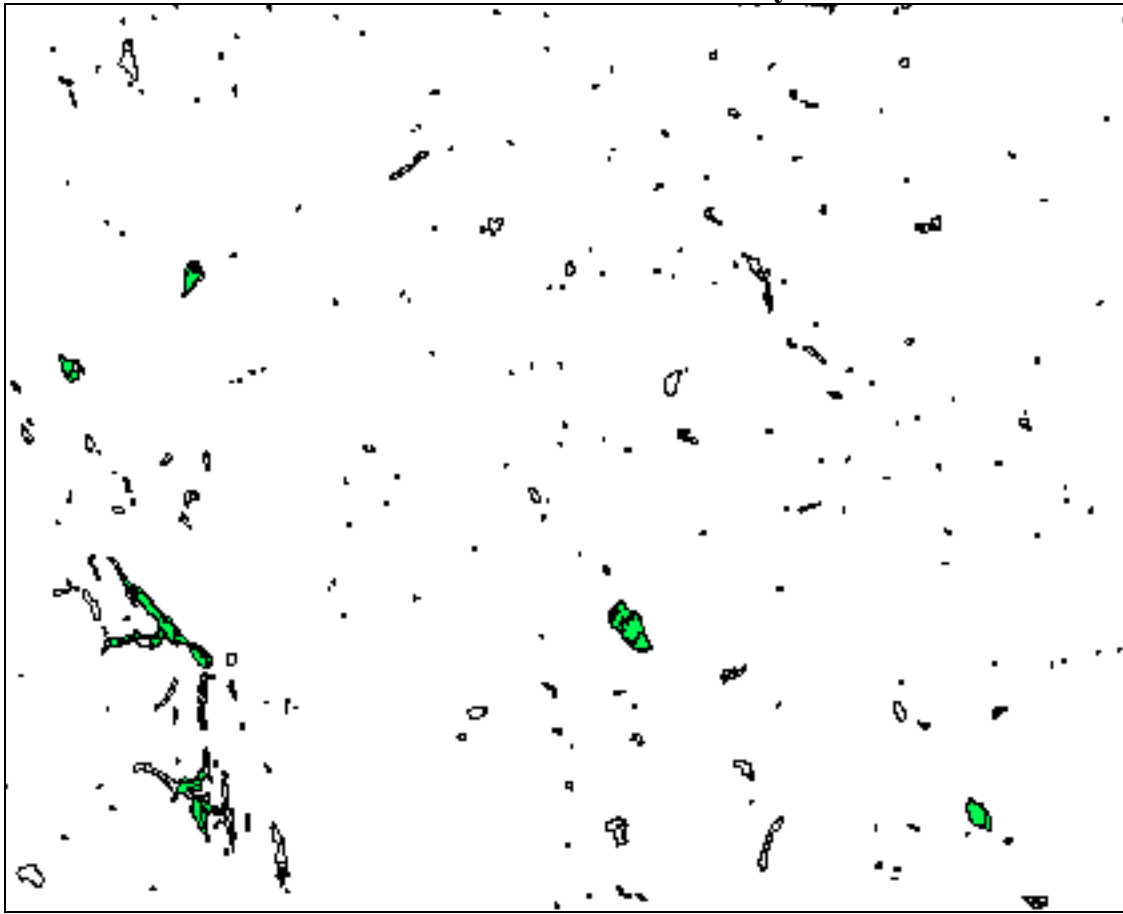
Key:

 Palustrine wetlands

scale: 1 inch = .195 miles

 DEC mapped wetlands

### Wetlands: Broome County

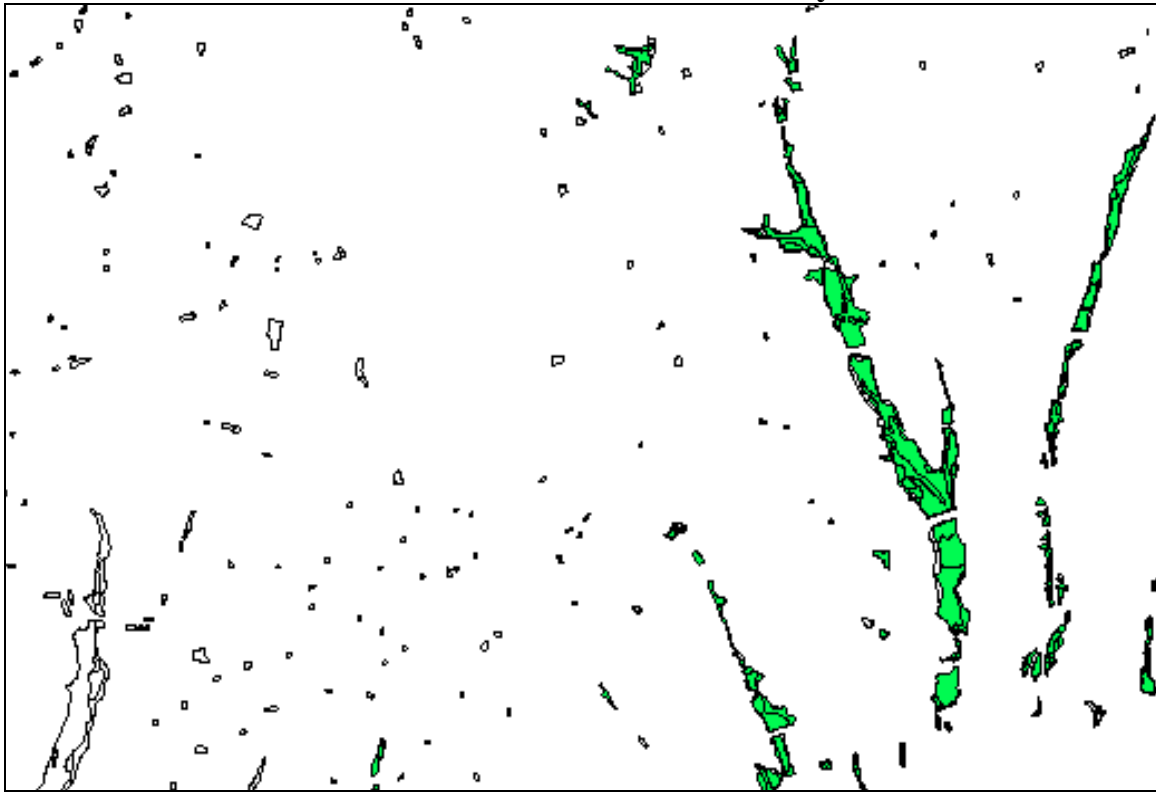



Key:  Palustrine wetlands

scale: 1 inch = .403 miles

DEC mapped wetlands

### Wetlands: Suffolk County



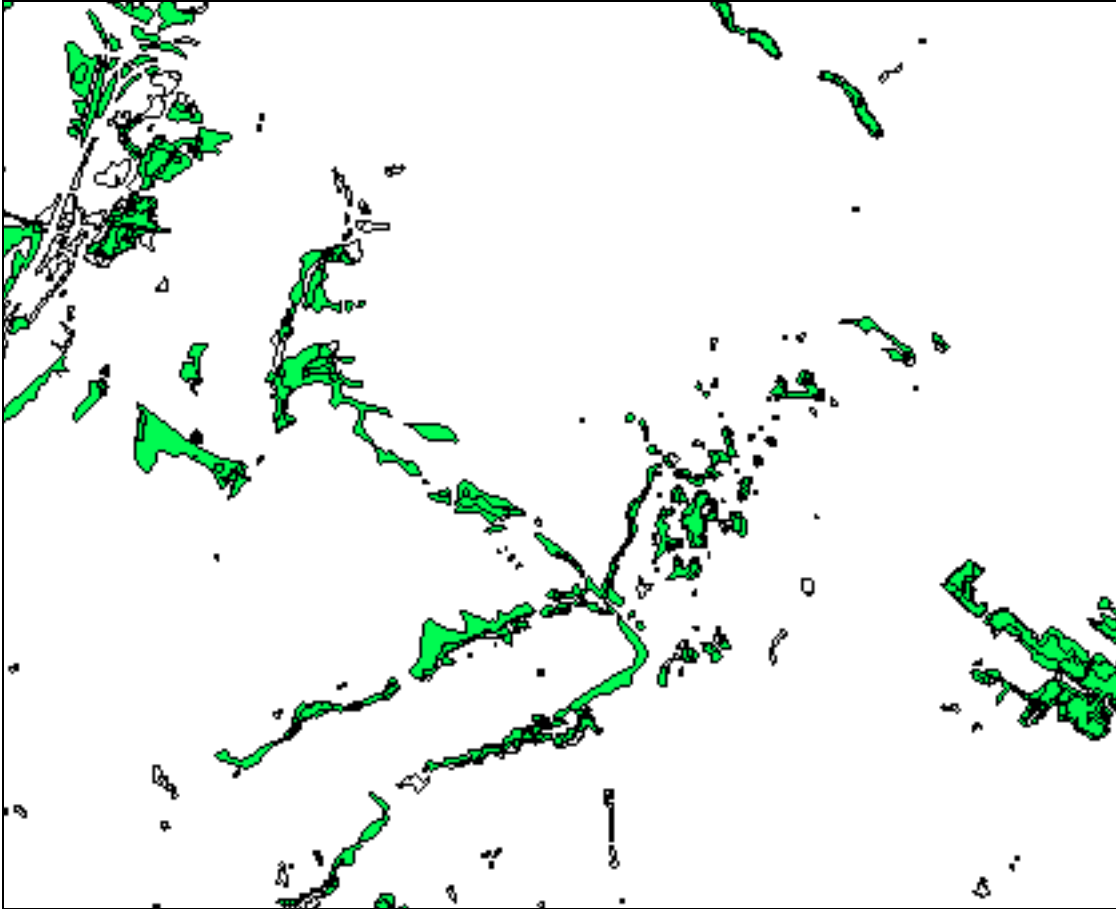
Key:  Palustrine wetlands

scale: 1 inch = .309 miles

 DEC mapped wetlands

The most heavily developed counties present a different picture. Few wetlands not on the state wetlands map remain, as the following map illustrate.

### Wetlands: Staten Island



Key:

- Palustrine wetlands
- DEC mapped wetlands

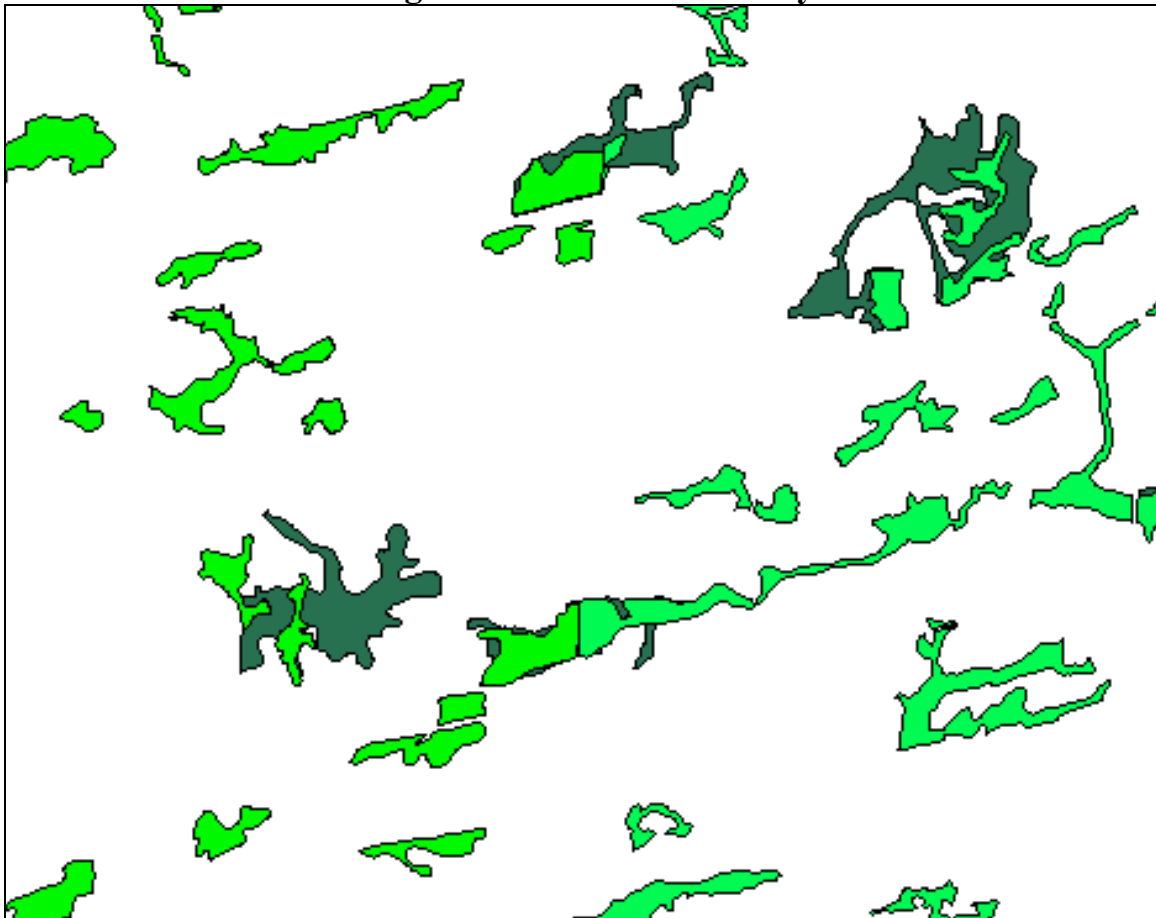
scale: 1 inch = .37 miles



## Mapping

A wetland must be on the state wetlands map to gain protection from New York State. The state wetlands map can only be updated to include wetlands that meet the size threshold, and scientific criteria for state protection through a regulatory process that involves public hearings. This report's GIS survey compared USFWS maps to the New York State wetlands map. The survey found numerous instances statewide of wetlands that met the size threshold and scientific criteria for inclusion on the state wetlands map, yet were not on the map.

For example, this map from Erie County illustrates three wetlands above 12.4 acres that only have a portion of the overall wetland mapped. If a wetland qualifies for state jurisdiction but is not on state map it does not receive protection.

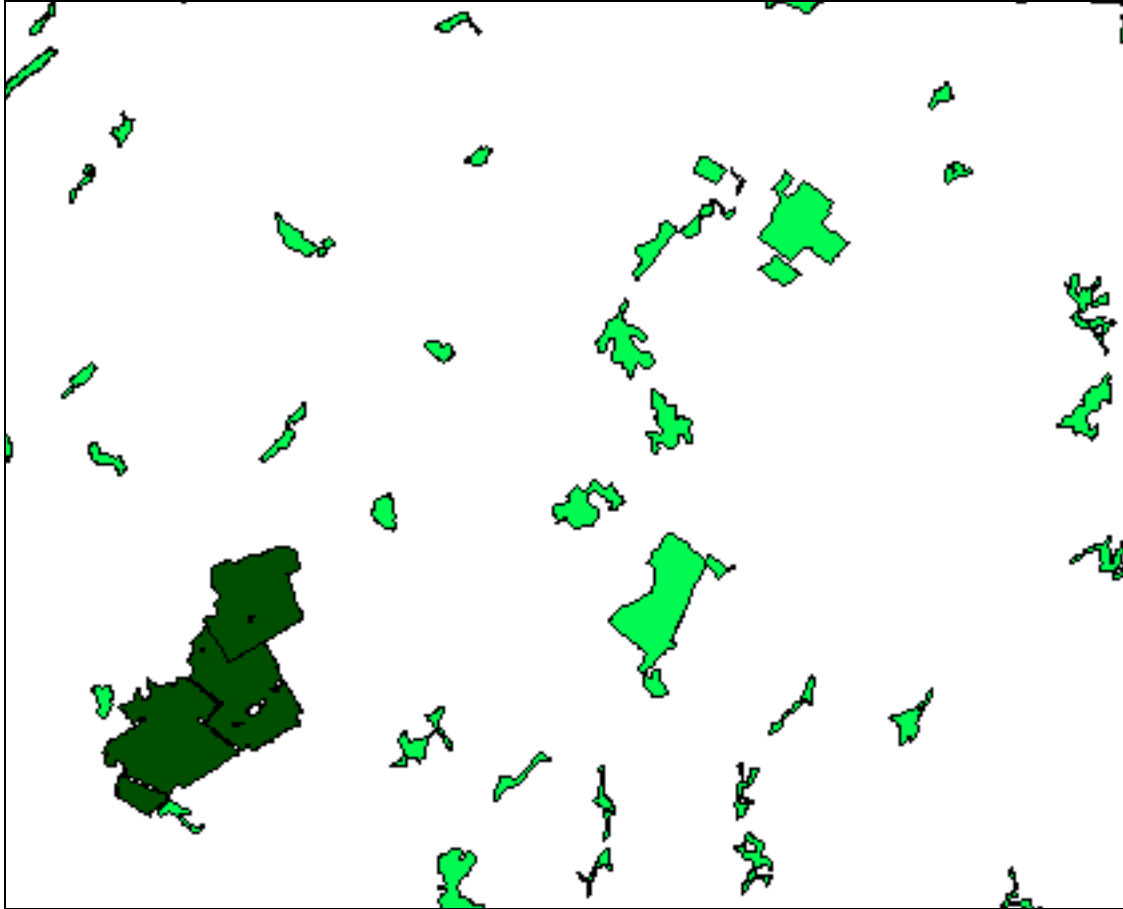
**Large Wetlands: Erie County**



Key  DEC mapped wetlands  
 Palustrine wetlands 12.4 acres or above

Likewise, this map from Orange County identifies a wetland that is 12.4 acres or greater that are entirely left off of the state wetlands map.

### Large Wetlands: Orange County



- Key
- DEC mapped wetlands
  - Palustrine wetlands 12.4 acres or above

Since these large wetlands do not appear on state wetland maps, they are not subject to the State's wetland protection law.

## **Conclusion**

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According to the United States Environmental Protection Agency, wetlands function to improve water quality, store floodwater, promote recharge of groundwater, provide fish and wildlife habitat as-well-as serve aesthetic and recreational functions.<sup>22</sup> These functions are critical to public safety because they protect the quality and quantity of waters that serve public water supplies and prevent flooding. These functions are also critical to maintaining a high quality of life for state residents because they support outdoor recreational pursuits such as fishing, hunting and bird watching. Finally, since wetlands serve as habitat for a wide variety of wildlife they help preserve the natural heritage that has been handed down by those who came before us and that we will pass on to future generations.

If we fail to protect wetlands then we jeopardize public safety, threaten the viability of our recreational pursuits and stand in danger of passing on an impoverished natural heritage. Since we have already lost the major portion of the state's historic wetlands, it is urgent for New York and other states to make sure they are doing a good job of protecting these important water bodies.

As our analysis shows, the vast majority of wetlands in the state fall outside of the jurisdiction of New York's Department of Environmental Conservation. This should concern New Yorkers because it means that we have little or no control over management of the lion's share of one of the state's most critical natural resources. Undoubtedly, a large portion of these wetlands do fall under the jurisdiction of the federal government, but since jurisdictional determination are made on a case by case basis and there is considerable variability in the application of federal jurisdiction it is impossible to determine how many wetlands will be protected by the federal government.

The Sierra Club believes that it is unwise for the state to leave a portion of its vital wetland resources without protection. We believe that it is also unwise for the state to leave the protection of such a large number of its wetlands up to the federal government. The New York legislature should act as quickly as possible to expand the jurisdiction of the DEC to comprehensively regulate the state's wetlands.

Since the state program provides a higher degree of protection than the federal program, we believe that the best approach is to give the DEC comprehensive regulatory authority over all New York wetlands. Also, since the mapping process is clearly fallible, we think that the existing requirement that wetlands be mapped, only serves to limit the state's ability to protect wetlands. Therefore we believe that the mapping requirement should be removed from New York's wetland protection law.

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<sup>22</sup> EPA 843-F-01-002c, September 2001

## **Appendix A: Methodology**

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### Raw Data

Raw data was taken specifically from the following web resources:

- The Download page of the National Wetlands Inventory of the United States Fish & Wildlife Service<sup>23</sup>. The data sets used are in the form of Shapedata arranged by single quads. The USFWS regional map<sup>24</sup> provides the official names of quads, and shows which quads include portions of New York State. Within the index of Shapedata, each quad is represented by a folder. Inside of that folder is a text file that lists all of the subsets of the quad (tiles)<sup>25</sup>. The text file also supplies map names for each tile, their abbreviation, and the states that they include. Every file from every quad that included any portion of New York State was downloaded. Each file must be downloaded individually, and these files were found in the following quad folders: Providence, New York, Hartford, Albany, Glens Falls, Lake Champlain, Newark, Scranton, Binghamton, Utica, Ogdensburg, Williamsport, Elmira, Rochester, Kingston, Warren, Buffalo, & Toronto.
- The Cornell University Geospatial Information Repository (CUGIR)<sup>26</sup>. Under “Select by Name<sup>27</sup>,” the data category was set to “water resources” and the data provider to “New York State Department of Environmental Conservation.” After listing data from “any series” the first theme that is listed is called “Freshwater Wetlands,” and this is the theme that was used. The data in this theme are arranged by county, with data from 59 of the 62 New York counties available<sup>28</sup>. Each file covers one complete county, and must be downloaded individually, in a zipped format.

### Data Modification

The following steps had to be taken in order for the raw data to be used for the purpose above. With respect to the USFWS data:

1. Each downloaded tile is in the form of a zipped file, and each file must be extracted in order to be viewed.
2. Once extracted, the folder contains at least four associated files, and some include up to 12. The four files always included represent the data set in polygon form, while the additional files (not used in this project) represent data in line and/or point form.
3. After being extracted, the polygon shapefile may be added and viewed using a GIS editor/viewer.

With respect to the NYSDEC data:

1. Each downloaded tile is in the form of a zipped file, and each file must be extracted in order to be viewed.

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<sup>23</sup> <http://wetlands.fws.gov/downloads.htm>

<sup>24</sup> [http://wetlands.fws.gov/regional\\_maps/region5.pdf](http://wetlands.fws.gov/regional_maps/region5.pdf)

<sup>25</sup> <http://wetlands.fws.gov/shapedata/albany/alb.txt> (Example of text file, Albany Quad)

<sup>26</sup> <http://cugir.mannlib.cornell.edu/>

<sup>27</sup> [http://cugir.mannlib.cornell.edu/browse\\_lis/browse\\_lis.html](http://cugir.mannlib.cornell.edu/browse_lis/browse_lis.html)

<sup>28</sup> Essex, Hamilton, and New York counties do not have mapfiles that are available for download.

2. Once extracted, the file has an .ee extension.
3. Using the “Import 71 program” associated with arcview, files with an .ee extension can be transformed into a shapefile that may be added and viewed using a GIS editor/viewer.

#### Data Setup

1. The tiles from each quad were combined using the “merge” function of arcview, so that an entire quad could be viewed at once, instead of only tile-by-tile.
2. Some of the quad shapefiles from western NY had their projection changed in order for them to align properly with the rest of the state, using a different program.
3. After the projection was changed in the appropriate quads<sup>29</sup>, the shapefiles were “clipped” to the shapefile that covered the entirety of NY State.
4. The “query” tool was then used to select the appropriate feature from each of the merged, clipped quads. For example, the query tool could be used to select all Palustrine wetlands that were of a certain size.
5. Once these features were select, the “convert to shapefile” option of arcview was used to create a new shapefile consisting exclusively of those features. Using this method, each of the subcategories was created.
6. Each of these new shapefiles contains the same information as the original data set, with respect to the selected features, and the count allows you to see how many wetlands fall into each category.

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<sup>29</sup> Warren Quad did not re-project properly. As a result, it was not able to be clipped to NY state, and so includes a significant portion of PA.