

Wetland Conservation: What Do We Have to Lose?



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Columbia County Water, Woods, and Wetlands, 17 March 2012



Cornell University

NYS Department of Environmental Conservation



Hudson River Estuary Program

Core Mission

- Ensure **clean water**
- Protect and restore fish, wildlife, and their **habitats**
- Provide water recreation and river **access**
- Adapt to **climate change**
- Conserve world-famous **scenery**



Photo by L. Heady





Photo by L. Heady

Presentation Outline

- What is a Wetland?
- Wetlands in Columbia County
- Value and Function of Wetlands
- Wetland Conservation





Photo courtesy of CLC

What is a wetland?

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Wetland definitions vary, but typically include three main components:

- 1.) presence of water
- 2.) unique soils that differ from adjacent upland soils
- 3.) vegetation that is adapted to wet conditions



Photo by L. Heady



Photo courtesy of CLC

Wetlands in Columbia County

NYS Department of Environmental Conservation





Photo courtesy of CLC

wet meadow

fen

emergent marsh

woodland pool

Wetlands in Columbia County

hardwood swamp

riparian wetlands

kettle shrub pool

springs and seeps

beaver pond



Wetlands and Streams in Columbia County





emergent marsh

Photo courtesy of CLC



riparian wetlands

Photo by L. Heady

A photograph of a hardwood swamp. The foreground is dominated by large, broad green leaves, likely skunk cabbage, growing in a lush, green carpet. Behind them, a variety of tree trunks, mostly thin and leaning, rise through the vegetation. The background is filled with more trees and foliage, creating a dense, green canopy.

hardwood swamp

A photograph of a small, shallow pond nestled in a forest. The water is calm, reflecting the surrounding trees and the sky. The forest floor is covered in fallen leaves and moss-covered tree stumps. The trees are tall and thin, with many branches reaching down towards the water. The overall atmosphere is peaceful and natural.

woodland pool

Photo by L. Heady



wet meadow

Value and Function of Wetlands



Photo by L. Heady



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Thomas P. DiNapoli, State Comptroller

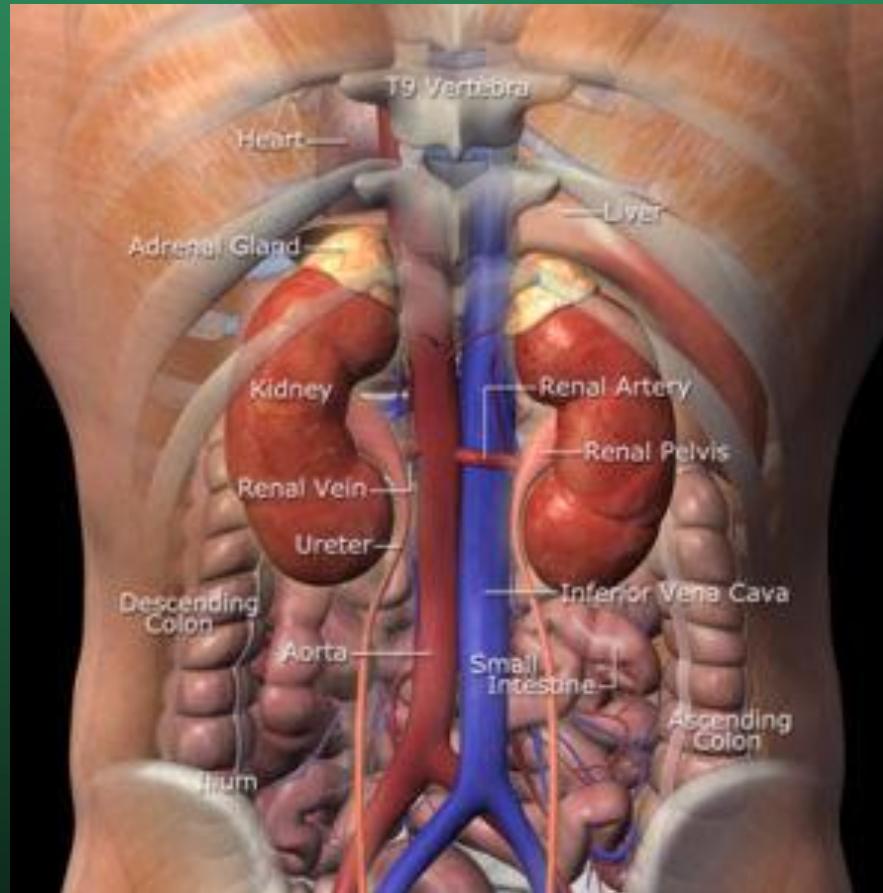
Economic Benefits of Open Space Preservation

March 2010

“In many instances, it is less expensive for a community to maintain open space that naturally maintains water quality, reduces runoff, or controls flooding than to use tax dollars for costly engineered infrastructure projects such as water filtration plants and storm sewers.”



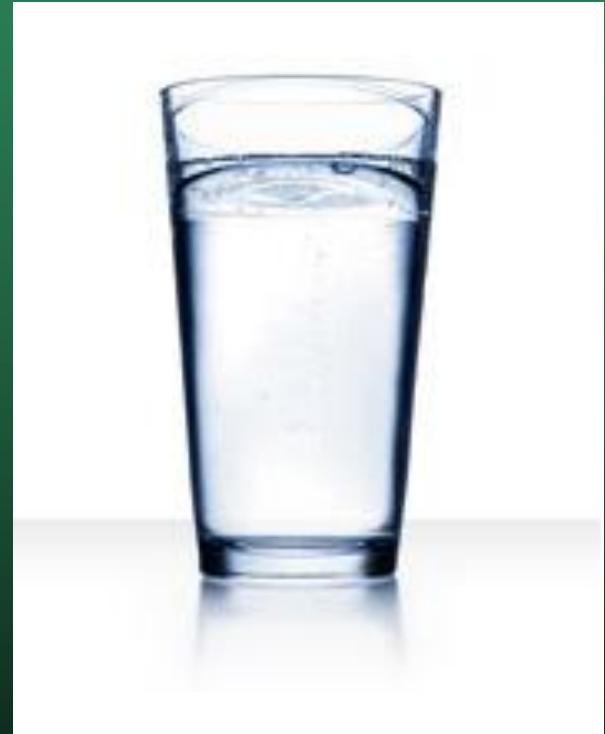
Wetland Functions: WATER PURIFICATION



Wetland Functions: **WATER PURIFICATION**

Wetlands are “living filters” and can:

- remove 20 to 60% of metals in water
- trap and retain 80 to 90% of sediment from runoff
- eliminate 70 to 90% of entering nitrogen.



Ecological Society of America



Wetland Functions: **WATER PURIFICATION**

What else does research show us? A few examples:

- a natural marsh was found to assimilate landfill leachate in Ontario (Fernandes et al., 1996)
- floodplain wetlands have been found to be particularly good at retaining phosphorus (Craft and Casey, 2000)
- wetlands with highly organic substrates and high densities of submerged aquatic plants appear able to remove pesticides (Brock et al., 1992)



Wetland Functions: **WATER PURIFICATION**

Regional example

NYC Water Supply System:
providing clean drinking water
to nearly half of NY's residents

artificial filtration plant

\$6-8 billion

VS.

watershed protection

(conservation of forests and wetlands)

→ \$1 billion



Photo by L. Heady



Wetland Functions: FLOOD CONTROL



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Wetland Functions: FLOOD CONTROL

Wetlands can:

- slow down floodwaters
- store floodwaters



1 acre of wetland can store >1 million gallons of floodwater.

Flood damages in the U.S. average \$2 billion each year.

(United States EPA, NOAA)



Wetland Functions: FLOOD CONTROL

What else does research show us?

Cumulative loss of small wetlands may have profound regional impacts; a single $\frac{1}{4}$ acre wetland may not seem a significant loss, but a thousand such losses may be a very different story, e.g., increased offsite flooding.

(Leibowitz 2003, Plocher et al. 2003)

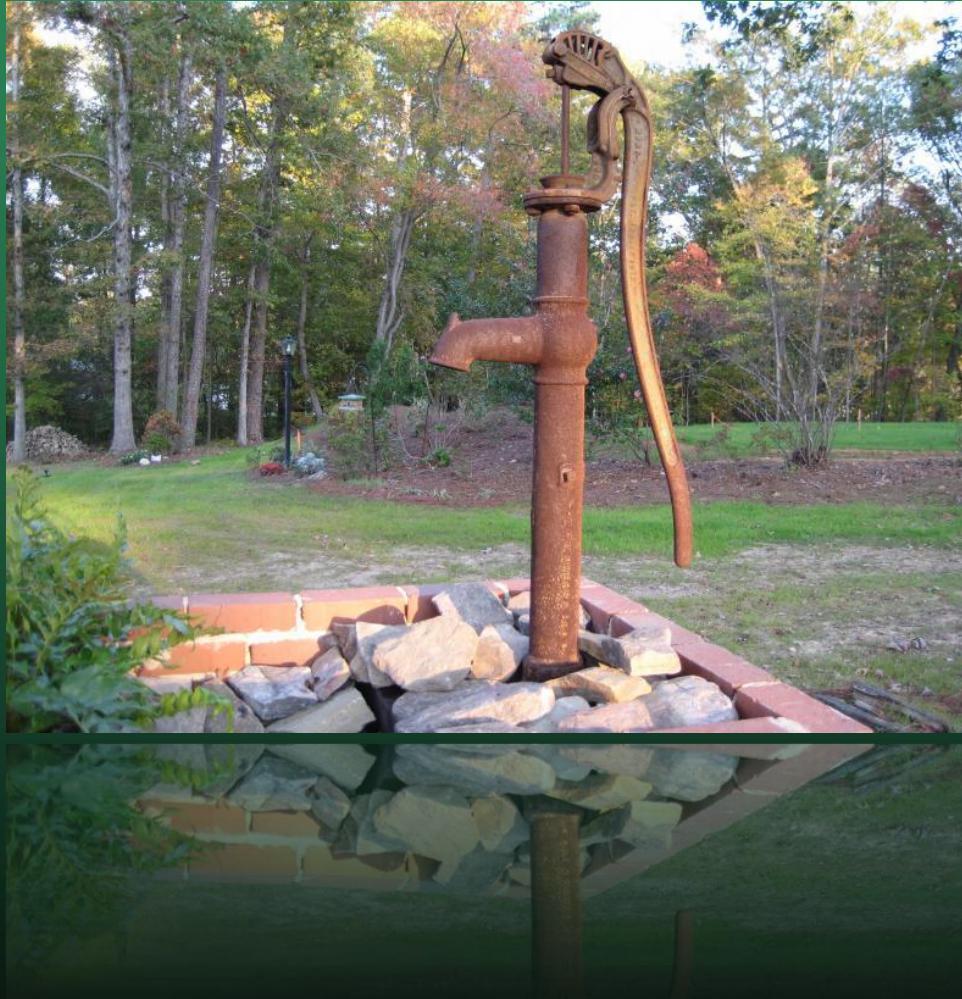


Photo by L. Zucker



Wetland Functions

GROUNDWATER RECHARGE/DISCHARGE

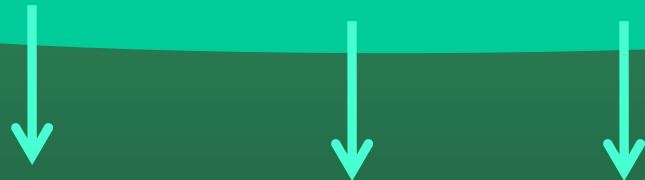


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Wetland Functions

GROUNDWATER RECHARGE/DISCHARGE

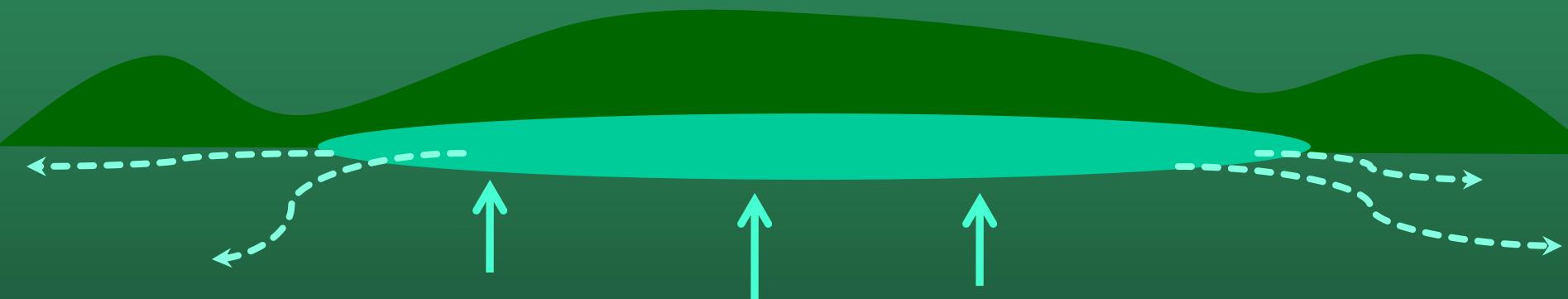


Some wetlands help maintain water table levels by recharging groundwater. This is especially important for communities that rely on drinking water wells.



Wetland Functions

GROUNDWATER RECHARGE/DISCHARGE



Some wetlands discharge groundwater, thus providing source water for adjacent wetlands or streams.



Wetland Functions: MOSQUITO CONTROL

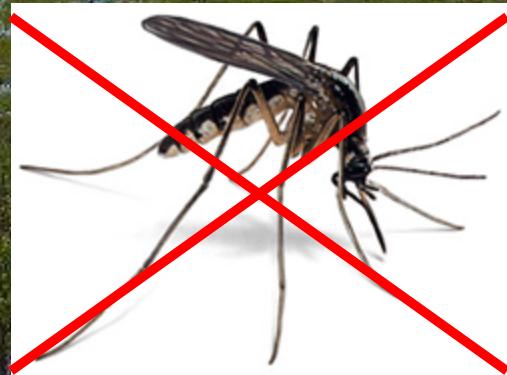
What's all
the buzz about?



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Wetland Functions: **MOSQUITO CONTROL**



Wetland Functions: MOSQUITO CONTROL

What else does research show us?

A study in North Dakota found many more mosquitoes in degraded wetlands than in higher quality wetlands. The authors concluded that:
“preservation of healthy wetlands, unpolluted by excessive urban storm water runoff and/or sedimentation should therefore be of vital concern to the public and to mosquito control agencies.”

(*Chipps et al. 2002*)



Wetland Functions: RECREATION



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Wetland Functions: **RECREATION**

In 2006 in New York:

3.5 million wildlife watchers ages 16 and older
(2.5 million people were birdwatchers), resulting in:

- over \$1.4 billion in retail sales
(estimated total multiplier effect = \$2.7 billion)
- 25,500 jobs
- over \$250 million in state and local tax revenues.

(2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation)



Photo by L. Heady

Photo by L. Heady

Photo by K. Marcell

Wetland Functions: **HABITAT**

Although wetlands cover only ~5% of the land in the lower 48, they are home to 31% of plant species.

Approximately one-half of all North American bird species nest or feed in wetlands.

(EPA, USFWS)



Photo by L. Heady

Wetland Functions: HABITAT

The U.S. Fish and Wildlife Service estimates that up to 43% of threatened and endangered species rely directly or indirectly on wetlands for their survival.





Photo by L. Heady



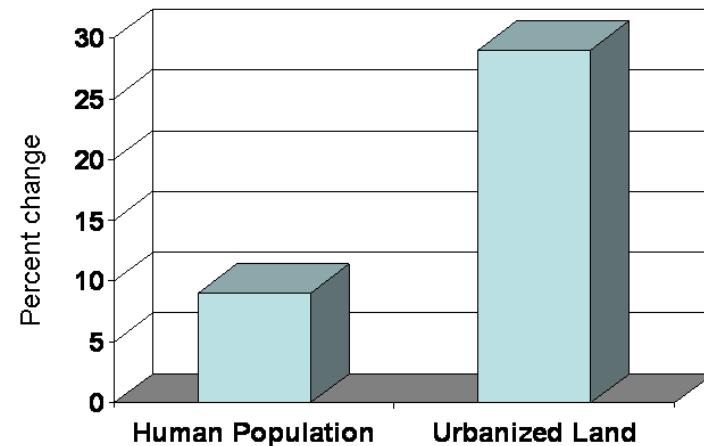
Wetland Conservation

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Poorly-planned development threatens wetland function (and costs communities.)

Increases in Hudson Valley Population and Urbanized Land Area
1982-1997



Source: R. Pendall. 2003. Sprawl without Growth: The upstate paradox. 2003.
The Brookings Institution Center on Urban and Metropolitan Policy.
<http://www.brookings.edu>



Source: Environmental Advocates of New York

Hudson Valley population grew 8-9% between 1982-1997.
Urban land cover increased 29%.



Some Wetland Statistics...

- New York has an estimated 2.5 million acres of freshwater wetlands and 25,000 acres of tidal wetlands.
- Between 1985 and 1995, NY had a net gain of approximately 15,000 acres of freshwater wetlands.
 - ~ 37,000 acres were *gained*, primarily from abandoned agricultural land reverting back to wetland.
 - ~ 22,000 acres were *lost*, primarily due to development and agriculture. **Net losses occurred in the Hudson Valley.**

(Huffman & Associates 1999)

“Development in urban and rural areas now is the cause of more than 60% of national wetland loss. **Several national assessments have noted deficiencies in current federal and state regulatory programs**...These regulatory gaps can best be closed by increased local management and regulation of wetlands.”



Photo by S. Cuppett

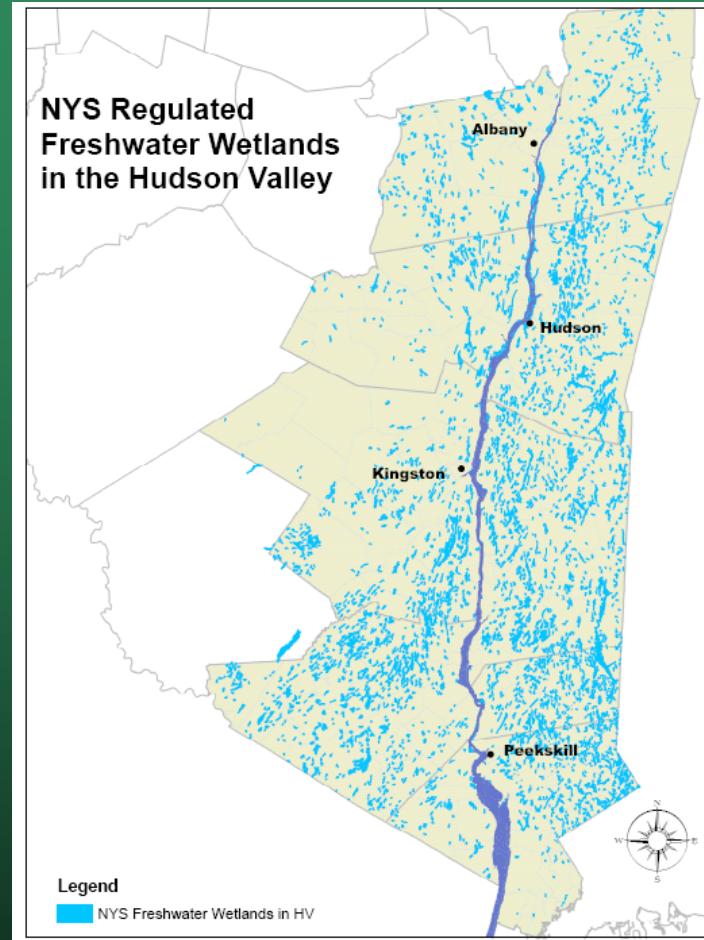
Center for Watershed Protection



What does New York State protect?

1. freshwater wetlands 12.4 acres and larger, with 100' adjacent area, and
2. smaller wetlands that are considered of 'unusual local importance'

*that are on the
Freshwater Wetlands Map.*

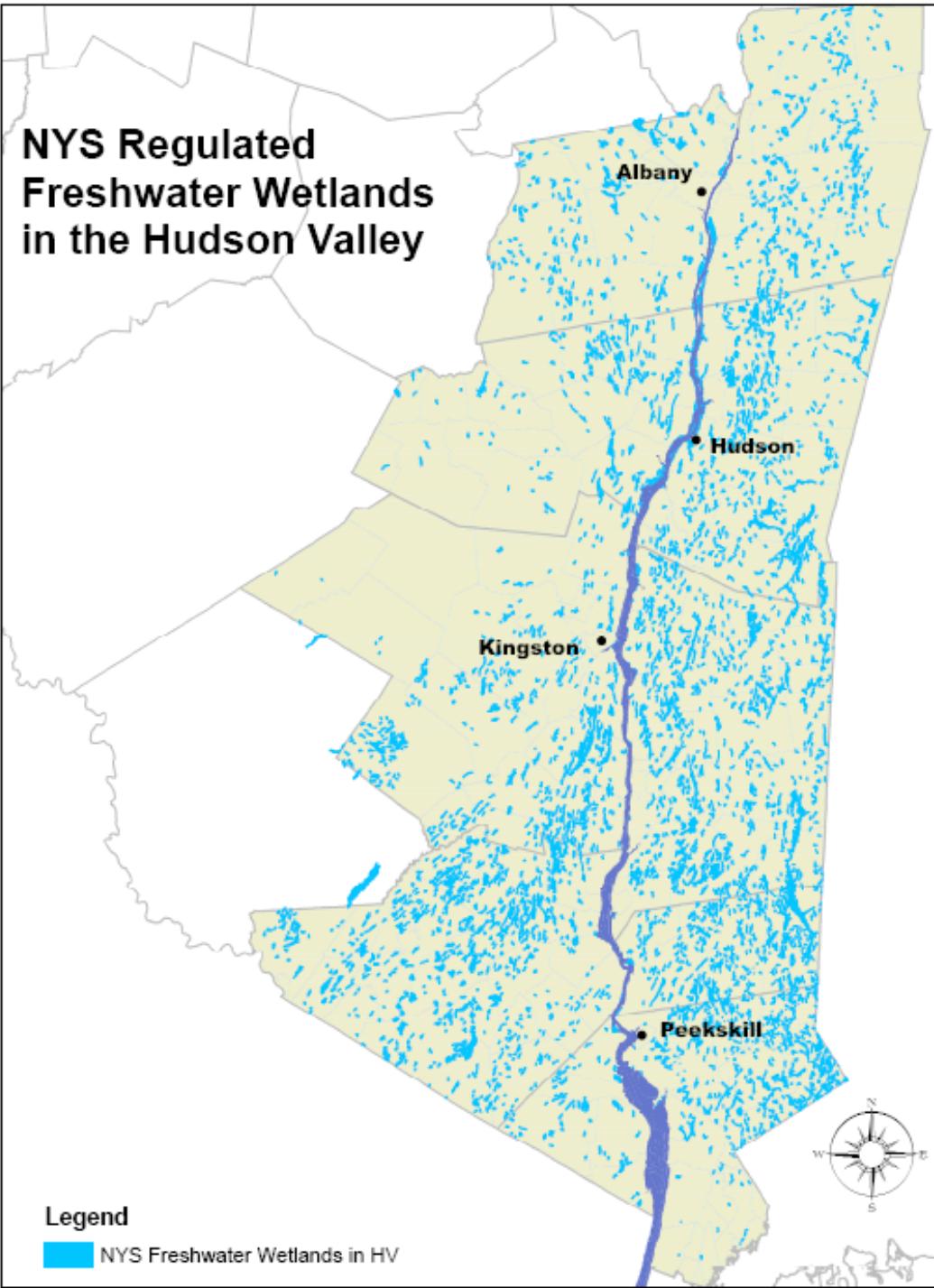


(Article 24 of the NYS Environmental Conservation Law)



A 1999 wetlands trends study suggested NYS regulatory maps were outdated and many wetlands >12.4 acres were not depicted on regulatory maps, and therefore not subject to jurisdiction.

(Huffman & Associates 1999)



What does the United States protect?

1. navigable waters and interstate waters as well as the wetlands that are adjacent to or neighbor these waters; and
2. relatively permanent waters and the wetlands that abut those.

(Section 404 of the Clean Water Act)

- The determination of jurisdiction is made by the Army Corps of Engineers.

In Columbia County, 55% of palustrine and riverine wetlands on National Wetland Inventory (NWI) maps are “small” (<12.4 ac) and geographically isolated.

(Zucker & Lau 2009)

This analysis included:
freshwater marshes
freshwater swamps
freshwater ponds
freshwater wetlands associated with rivers and streams

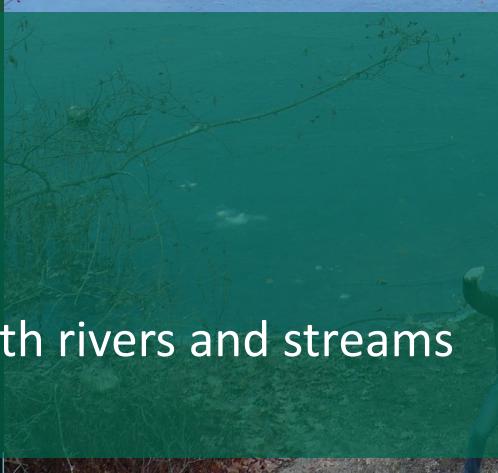
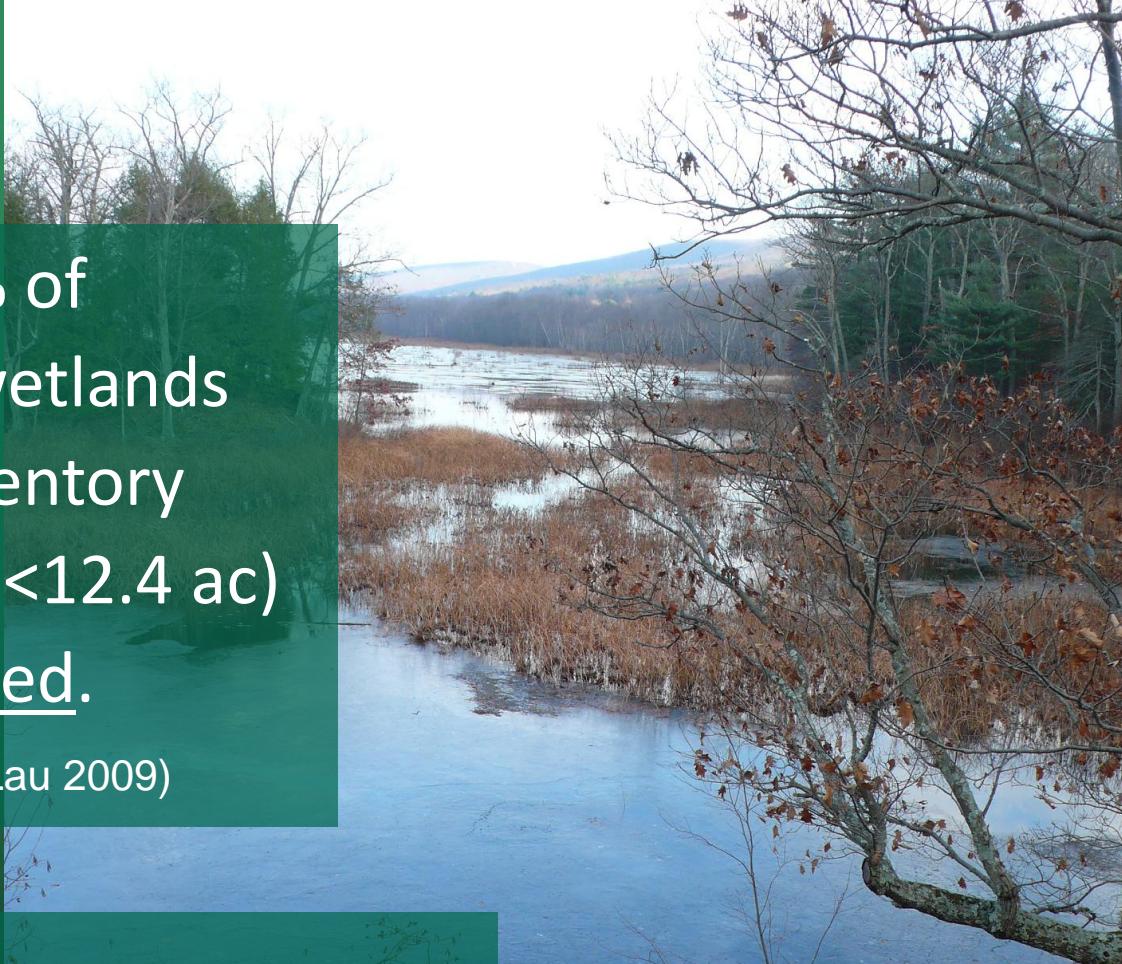


Photo by L. Heady

In addition...

National Wetland Inventory (NWI)
maps have inaccuracies, especially
with respect to small wetlands.

In a comparison of NWI maps and
Hudsonia habitat maps in a 300
square mile area in Dutchess Co.:

- Hudsonia maps had 75% more wetlands than NWI maps
- Hudsonia maps had 23% more wetland area
- Hudsonia maps had 115% more small (<0.5 ac) wetlands.



(Bell 2009)

“Development in urban and rural areas now is the cause of more than 60% of national wetland loss. Several national assessments have noted deficiencies in current federal and state regulatory programs...**These regulatory gaps can best be closed by increased local management and regulation of wetlands.”**

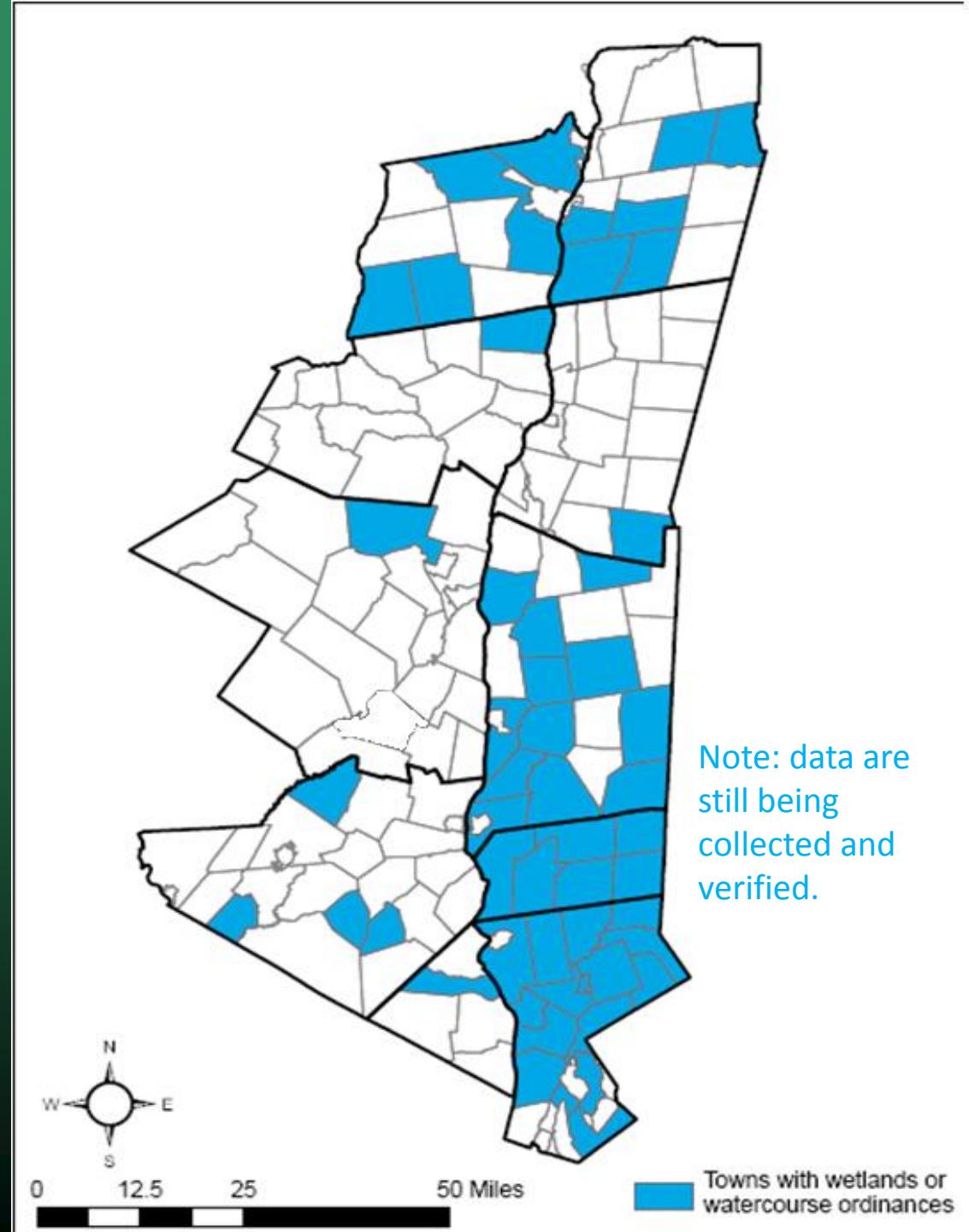


Photo by L. Heady

Center for Watershed Protection



Many municipalities in the Hudson Valley have passed their own wetland and watercourse ordinances to protect their community's wetland assets.



Other Local Approaches to Wetland Conservation

- take a “big picture” view of your town to maintain ecosystem services
- learn where important resources are located in your community
- use plans and zoning to guide conservation and land-use decisions
- consider wetland and habitat conservation *early* in the planning process
- ask questions during SEQR
- educate the community



Photos by L. Heady



Take Home Messages

- 1.) Wetlands have tremendous value and provide important services that support human and natural communities.
- 2.) Many wetlands are not protected by State and Federal regulations.
- 3.) Local communities have opportunities to conserve vulnerable wetlands and the services they provide.

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Cornell University Dept. of Natural Resources



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Photo by L. Heady

