

## Drinking Source Water Protection Scorecard Review for Seven Hudson Communities:

*A review of programs and policies to protect drinking water supplies for the Towns of Esopus, Hyde Park and Lloyd, the City and Town of Poughkeepsie, and the Town and Village of Rhinebeck.*



February 6, 2018



## **Acknowledgements**

This report was prepared by the Center for Watershed Protection, Inc. for the Hudson Riverkeeper using funds from the Park Foundation. We are grateful for their support of this effort.

In addition, we wish to thank the representatives of the seven Hudson communities who agreed to participate in this process, as well as the New York State Department of Environmental Conservation who assisted with this process:

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## **Cover Image**

The cover image was taken by the Hudson Riverkeeper, and depicts oil tanker Afrodite near the drinking water intakes for the City of Poughkeepsie and the Town of Lloyd.

## Background and Introduction:

Millions of people rely on the Hudson River Estuary Watershed for drinking water, including more than 100,000 people who use water from the Hudson itself. To protect and improve the quality of drinking water and protect public health, Source Water Protection is needed. Source Water Protection is a series of measures that protect drinking water supplies from contamination.

In 2016, Riverkeeper researched the drinking source water protection failures that preceded the contamination of the City of Newburgh's primary reservoir. As a part of this project, Riverkeeper developed the Drinking Source Water Protection Scorecard ( the Scorecard; available at [www.riverkeeper.org/water-quality/drinking-source-water-protection/](http://www.riverkeeper.org/water-quality/drinking-source-water-protection/) ) to help other communities in New York State "audit" drinking source water protection programs. In the summer of 2017, the Center for Watershed Protection entered into a partnership with Riverkeeper to complete the Scorecard and work with the seven communities that draw primary drinking water from the Hudson River Estuary, including: the Towns of Esopus, Hyde Park and Lloyd, the City and Town of Poughkeepsie and the Town and Village of Rhinebeck (the seven Hudson communities). This report summarizes some of the key findings from the Scorecard review, and makes recommendations for the municipalities involved in the assessments.

The Scorecard includes eight sections, of which focuses on a specific element of source water protection. The review and recommendations are structured according to these elements, which include the following:

1. Source Water Assessments
2. Source Water Protection Program
3. Watershed Planning
4. Land Use
5. Streams
6. Wetlands
7. Forests and Open Space
8. Other

## Key Findings

Overall, the Scorecard review suggests that, while the Hudson and its tributaries have been studied quite extensively, there are several data gaps regarding source water protection. In addition, while the seven Hudson communities and several watershed groups are interested in the resource as a source water, programs and regulations are currently not in place to support these efforts:

1. While there are many monitoring and protection efforts active in the Hudson River and many of its small creeks, there has been no comprehensive source water protection effort addressing intakes along the Hudson River.
2. Source Water Assessments (SWAs) were conducted for the seven Hudson communities (and in New York State) in the early 2000s, by the County Health Departments. Overall, the SWAs were not readily available, and in interviews with Treatment Plant operators and municipal officials, they were generally not used as a guideline for watershed planning.

3. Though modeling based on water quality monitoring should be a priority in the long term, the watershed boundary defined by the Department of Health for the initial SWAs is based on a standard delineation of large, tidally influenced water supplies.
4. The initial SWAs were completed over 12 years ago, and were based on land use data from about 25 years ago.
5. When water quality issues have arisen over the years, they have generally been addressed by improving treatment technologies rather than by addressing the source water quality.
6. Although quite a few small watershed planning or monitoring efforts have been underway and the New York State Department of Environmental Conservation (DEC) Hudson River Estuary Program supports watershed planning and implementation, to date these efforts have not focused on protecting source water quality.
7. There are several small watershed planning efforts for many of the creeks that drain to the Hudson. However, these plans are highly variable in their ultimate goals. In addition, these plans tend to emphasize analysis and evaluation of the watershed over municipal authority to implement specific projects.
8. While several citizens groups are active in the region, there is no dedicated funding source or intermunicipal council dedicated to implementing source water or watershed protection goals.
9. Although the seven Hudson communities control all the land within their jurisdiction, the total land area draining even to the section of the Hudson upstream and downstream of the intakes is dominated by other jurisdictions.
10. A review of DEC Stream classifications suggests that the Hudson River itself in this section is classified as Class A (drinking water), but contributing streams are typically B or C, even if they drain directly to the area near an intake.
11. DEC wetlands mapping may not include all freshwater wetlands, but some towns have done some in depth mapping of wetlands areas within the last 10 years.
12. The Hudson Valley is specifically mentioned as a conservation area in The NYS Open Space Conservation Plan, but the primary goals are agricultural preservation and floodway protection, rather than water quality.
13. Regular monitoring is conducted in the Hudson River, but the monitoring has not focused on drinking water contaminants or source water protection.
14. Stormwater regulation is inconsistent in this portion of the Hudson River Watershed. While some of the municipalities are regulated by the state's State Pollution Discharge Elimination System (SPDES) permit for Municipal Separate Sewer Systems (MS4s), many are not regulated communities and thus are not required to have a stormwater program.

## Recommendations

The Scorecard provides an overview of programs and policies in place to protect source waters, focusing on eight overall categories. Although there are five separate intakes on the Hudson River serving these seven communities, we completed a single assessment to reflect the overall progress within the region to protect this drinking water source.

While there are many monitoring and protection efforts active in the Hudson River and many of its small creeks, there has been no comprehensive source water protection effort addressing intakes along the Hudson River. The Scorecard review highlights some of the potential gaps. A summary of recommendations is driven by the Scorecard review. In moving forward, we suggest utilizing the Source Water Protection framework, approved by the American Waterworks Association (ANSI/AWWA G300-14). This approach outlines a six-phase planning approach, including the following:

1. Source Water Protection Program Vision and Stakeholder Involvement  
*In this phase, utilities establish a vision and commitment to source water protection, involve stakeholders, such as local watershed groups in defining this vision.*
2. Characterization of Source Water and Source Water Protection Area  
*This phase is similar to the SWAs conducted for each utility. However, recent guidance suggests additional analyses, including a review of local laws to protect source water, a database of threats and land use changes, and a comprehensive review of monitoring data. The guidance also suggests considering climate change when assessing risks in the watershed.*
3. Source Water Protection Goals  
*In this stage, specific and measurable goals are defined for the source water.*
4. Action Plan  
*The action plan identifies specific projects and actions needed to meet source water protection goals. The plan should include ongoing planning, as well as emergency response measures to respond to threats in the watershed.*
5. Program Implementation  
*In this step, specific plans are implemented to protect source water.*
6. Evaluation and Revision  
*Periodically, the plan and program elements should be re-evaluated and the plan should be revised.*

The forty-three recommendations in this report draw from this standard, as well as the Scorecard review.<sup>1</sup> The comprehensive list of these recommendations (Table 2) divides them into “Short Term” (i.e., one to three-year time frame) and “Long Term” recommendations. However, even the “Short Term” list includes a large number (twenty-five) of recommendations. Table 1 includes ten high priority first steps to initiating Source Water Protection efforts.

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<sup>1</sup> The DEC is currently developing statewide guidance for source water protection. Once the DEC guidance is complete, the recommendations contained in this report should be reviewed for consistency with that document.

**Table 1. Ten First Steps to Source Water Protection in the Hudson**

- 1) Request a SWA Update from the New York State Department of Environmental Conservation (DEC) and the New York State Department of Health. The update should include an update of pollution sources and land cover with more recent data.
- 2) Review the SWA process with DEC to ensure that stakeholders in the watershed understand what analyses are being conducted, and that the assessments meet future planning needs.
- 3) Crude oil spills pose perhaps the greatest immediate risk to drinking water supplies on the Hudson River. Increased traffic on the Hudson by oil barge, tanker and railroad car have increased spill potential significantly in recent years. The updated SWA should include an assessment of these risks.
- 4) The seven Hudson Communities should form an intermunicipal coalition to manage long-term source water protection plan development and implementation.
- 5) Fund a position to coordinate and manage source water protection with coalition funds.
- 6) In Regulated MS4 communities, incorporate source water protection into Annual Reports and plans.
- 7) Hold regular meetings of multiple groups and government agencies interested in protecting Hudson River source waters. This group will serve as stakeholders in the planning process. Members should include municipal representatives and representatives from relevant state and county agencies, including but not limited to Department of Health, the DEC, Department of Transportation, Highway Departments, Soil and Water Conservation Districts, and Cornell Cooperative Extension.
- 8) Secure a source of funding for the planning effort.
- 9) Convene local and regional land trusts to discuss and begin to prioritize Source Water Protection needs.
- 10) Share results of this Scorecard assessment with relevant agencies and municipalities active in the source watershed area.

<b>Table 2. Recommendations from Scorecard Review</b>	
Short Term (1-3 years)	Long Term
<b>1. Source Water Assessment (SWA)</b>	
<ol style="list-style-type: none"> <li>1) Request a SWA Update from the New York State Department of Environmental Conservation (DEC) and the New York State Department of Health. The update should include an update of pollution sources and land cover with more recent data.</li> <li>2) Review the SWA process with DEC to ensure that stakeholders in the watershed understand what analyses are being conducted, and that the assessments meet future planning needs.</li> <li>3) Enhance the original SWAs by incorporating other data relevant to sources of sanitary waste including septic systems, or large diameter sewer lines.</li> <li>4) Where possible, conduct “windshield surveys” to ground truth potential pollution sources and characterize land use.</li> <li>5) Crude oil spills pose perhaps the greatest immediate risk to drinking water supplies on the Hudson River. Increased traffic on the Hudson by oil barge, tanker and railroad car have increased spill potential significantly in recent years. The updated SWA should include an assessment of these risks.</li> <li>6) Evaluate zoning or build-out to predict the impacts of future development or other land use changes on water quality.</li> <li>7) Make SWAs publicly available and readily accessible.</li> <li>8) The SWA should consider the impacts of climate change, particularly regarding the salt front.</li> </ol>	<ol style="list-style-type: none"> <li>9) Consider incorporating watershed models or other more formal assessments of pollutant potential in updated assessments.</li> </ol>
<b>2. Source Water Protection Program</b>	

<b>Table 2. Recommendations from Scorecard Review</b>	
Short Term (1-3 years)	Long Term
<p>10) The seven Hudson Communities should form an intermunicipal coalition to manage long-term source water protection plan development and implementation.</p> <p>11) Fund a position to coordinate and manage source water protection with coalition funds.</p> <p>12) In Regulated MS4 communities, incorporate source water protection into Annual Reports and plans.</p> <p>13) Consider source water protection when developing and revising Comprehensive Plans.</p>	<p>14) Identify opportunities for the seven municipalities to share staff or other resources to implement priority projects.</p>
<b>3. Watershed Planning</b>	
<p>15) Hold regular meetings of multiple groups and government agencies interested in protecting Hudson River source waters. This group will serve as stakeholders in the planning process. Members should include municipal representatives and representatives from relevant state and county agencies, including but not limited to Department of Health, the DEC, Department of Transportation, Highway Departments, Soil and Water Conservation Districts, and Cornell Cooperative Extension.</p> <p>16) Secure a source of funding for the planning effort.</p>	<p>17) Identify specific goals for the planning effort in stakeholder groups.</p> <p>18) Encourage the development of watershed plans for tributaries within the source water area, and ensure that preservation or improvement of water quality is a goal of each plan.</p> <p>19) Identify specific projects and costs.</p> <p>20) Complete a codes review of all municipalities in the delineated watershed, including those that do not receive water from these plants (Also see Recommendation 24).</p> <p>21) Develop inter-municipal cooperation agreements to manage watersheds whose boundaries extend beyond the limits of the seven Hudson communities.</p>
<b>4. Land Use</b>	

<b>Table 2. Recommendations from Scorecard Review</b>	
Short Term (1-3 years)	Long Term
	<p>22) Work with Dutchess and Ulster Counties to develop comprehensive land use plans at the County scale that reflect watershed goals.</p> <p>23) Designate specific Critical Environmental Areas to protect water quality in the source water area.</p> <p>24) Complete a comprehensive revision of land use regulations and subdivision codes to identify opportunities for improvement. One tool that can be used for this review is the Codes and Ordinances Worksheet (COW). The Hudson River Estuary Program has a New York version at:  <a href="http://www.dec.ny.gov/docs/remediation_hudson_pdf/cownys.pdf">www.dec.ny.gov/docs/remediation_hudson_pdf/cownys.pdf</a></p> <p>25) Identify specific code and zoning changes to be consistent with watershed planning goals.</p> <p>26) Work with the state or county departments to implement specific regional rules and regulations</p> <p>27) Request or draft updates to DOH Watershed Rules and Regulations.</p>
<b>5. Streams</b>	
<p>28) Review stream classifications with DEC.</p> <p>29) Complete a review of discharge permits to identify potential violations in the watershed.</p>	<p>30) Incorporate special stream protections into local laws.</p>
<b>6. Wetlands</b>	
<p>31) Work with the DEC to update state wetlands maps, and enhance with local wetland maps where possible and as indicated by watershed planning efforts.</p>	<p>32) Develop local codes that protect these wetland systems.</p>
<b>7. Forests and Open Space</b>	

Table 2. Recommendations from Scorecard Review	
Short Term (1-3 years)	Long Term
<p>33) Convene local and regional land trusts to discuss and begin to prioritize Source Water Protection needs.</p>	<p>34) Building on the proposed watershed planning effort, identify strategic forest and open space preservation areas that would help preserve water quality in the Hudson River.</p> <p>35) Advocate to use NYS Open Space Conservation Plan funds to preserve forest and open space in these strategic locations.</p> <p>36) Revise comprehensive plans to identify priority conservation areas.</p>
<p>8. Other</p>	
<p>37) Conduct a comprehensive review of available monitoring data, to include unregulated contaminants.</p> <p>38) Continue ongoing bacteria monitoring.</p> <p>39) Work with the DEC RIBS program to obtain data and participate in the stream assessment process.</p> <p>40) Develop and install signs to identify the Hudson River as a Source Water and install in the watershed immediately draining to drinking water intakes.</p> <p>41) In Dutchess County, MS4 communities cooperate, under the leadership of the Dutchess County Soil and Water Conservation District, to meet the requirements of the MS4 permit. Unregulated communities such as Rhinebeck should consider participating in this group to implement stormwater controls.</p> <p>42) In Ulster County, there is no equivalent forum. Work with Ulster County to establish a similar cooperative group, or consider forming a Hudson River MS4 advisory panel that works with communities throughout the Hudson River.</p> <p>43) Share results of this Scorecard assessment with relevant agencies and municipalities active in the source watershed area.</p>	

## Riverkeeper’s Drinking Source Water Protection Scorecard

The following section summarizes findings using the Scorecard. Each section below describes impressions based on interviews with town and village officials, as well as targeted internet searches.

### Section 1. Source Water Assessment

SWAs were conducted for these Hudson River communities (and in New York State) in the early 2000s, by the County Health Departments. Overall, these plans were not readily available, and in interviews with Treatment Plant operators and municipal officials, they were generally not used as a guideline for watershed planning. One exception was the Town of Poughkeepsie, who reported using their SWA to prioritize watershed improvement projects.

1. Source Water Assessment	YE S	NO	UN- SURE	N/A
1a. Does your water source have a <b>Source Water Assessment</b> ?	1			
1b. Does it include an <b>accurate and complete watershed map</b> defining your drinking water supply's watershed?	1			
1c. Does it accurately catalog <b>all potential hazards</b> ?		1		
1d. Does its land use assessment characterize the <b>risk from urban stormwater runoff</b> ?		1		
1e. Does its land use assessment characterize the <b>risk from agricultural runoff</b> ?			1	
1f. Is it <b>easily accessible to the public</b> ?		1		

#### **1a. Does your Water Source Have a Source Water Assessment?**

A SWA was completed for each plant (withdrawal) from the Hudson River, and these were completed in approximately 2003-2004 by County Health Departments.

#### **1b. Does it include an accurate and complete watershed map defining your drinking water supply watershed?**

We reviewed the Rhinebeck plan for this project and found that the mapping was reasonable, based on the available data. Since the Hudson River is such a large water supply, the mapping focused on the streams that drain both to within five miles downstream and fifteen miles upstream of the intake. Although this boundary does not encompass the entire Hudson watershed, it is a standard delineation for a large, tidally influenced water supply. The specific boundaries were mapped with HUC 11 watershed boundaries.

### **1c-1e. Characterization of Risks**

The original SWAs cataloged hazards that were readily mapped, including:

- Chemical storage
- Permitted and Cataloged Toxic areas (CERCLA, RCRA and TRI)
- Hazardous Waste Sites and Spills
- Land fills
- Mines and Oil/Gas Wells
- Permitted sanitary and non-sanitary waste discharges

The land cover analyses in the original SWAs used the National Land Cover Data set (NLCD). The data is based on images from the period between 1988 and 1993.

Each source and land cover category was associated with a relative risk for general pollutant categories, such as metals or hydrocarbons. One difficulty in these assessments are that some of the databases, such as the Toxic Release Inventory (TRI) did not report very detailed information, thus making it difficult to associate presence of these facilities with specific pollutants. One potential concern in this section of the Hudson is the advancement of the salt front as global climate change occurs. The original SWAs did not investigate these issues.

### **1f. Accessibility**

In general, we found that the original SWAs were not widely available. Most community representatives and treatment plant operators were not using the plans to guide their activities or develop land use or other regulations, and it was also unclear whether the public is permitted to view these documents.

#### *1.1: SWA: Recommendations*

The initial SWAs were completed over 12 years ago, and were based on land use data from about 25 years ago. We recommend that a comprehensive SWA for the treatment plants serving the seven communities. Some elements of the update would include:

- 1) Request a SWA Update from the New York State Department of Environmental Conservation (DEC) and the New York State Department of Health. The update should include an update of pollution sources and land cover with more recent data.
- 2) Review the SWA process with DEC to ensure that stakeholders in the watershed understand what analyses are being conducted, and that the assessments meet future planning needs.
- 3) Enhance the original SWAs by incorporating other data relevant to sources of sanitary waste including septic systems, or large diameter sewer lines.
- 4) Where possible, conduct “windshield surveys” to ground truth potential pollution sources and characterize land use.
- 5) Crude oil spills pose perhaps the greatest immediate risk to drinking water supplies on the Hudson River. Increased traffic on the Hudson by oil barge, tanker and railroad car have increased spill potential significantly in recent years. The updated SWA should include an assessment of these risks.
- 6) Evaluate zoning or build-out to predict the impacts of future development or other land use changes on water quality.
- 7) Make SWAs publicly available and readily accessible.
- 8) The SWA should consider the impacts of climate change, particularly regarding the salt front.

- 9) Consider incorporating watershed models or other more formal assessments of pollutant potential in updated assessments.

## Section 2. Source Water Protection Program

Although the original SWA program was intended to form the basis for source water protection, our discussions with plant operators and community leaders suggest that they do not have a formal source water protection program. Some water quality issues have arisen over the years. For example, the Poughkeepsie plant had issues with disinfection byproduct violations. However, these issues have generally been addressed by improving treatment technologies rather than by addressing the source water quality.

2. Source Water Protection Program	YES	NO	UNSURE	N/A
2a. Does your water source have a <b>Source Water Protection Program</b> ?		1		
2b. Does it address <b>all potential threats</b> identified in the Source Water Assessment?				1
2c. Are <b>priority projects</b> being implemented?				1
2d. Is there a <b>dedicated source of funding</b> for source water protection projects?				1
2e. Are <b>one or more staff members</b> in your municipality dedicated to source water protection?				1

### 2.1 Source Water Protection Program: Recommendations

The Source Water Protection effort will be a long process, and should include elements of the AWWA Source Water Protection guidance. Some specific recommendations include:

- 10) The seven Hudson Communities should form an intermunicipal coalition to manage long-term source water protection plan development and implementation.
- 11) Fund a position to coordinate and manage source water protection with coalition funds.
- 12) In Regulated MS4 communities, incorporate source water protection into Annual Reports and plans.
- 13) Consider source water protection when developing and revising Comprehensive Plans.
- 14) Identify opportunities for the seven municipalities to share staff or other resources to implement priority projects.

## Section 3. Watershed Management Planning

In this section of the Hudson River, quite a few small watershed planning or monitoring efforts have been underway. In addition, the New York State DEC's Hudson River Estuary Program supports watershed planning and implementation. However, to date these efforts have not focused on protecting source water quality.

3. Watershed Management Planning	YES	NO	UNSURE	N/A
3a. Is there a <b>comprehensive watershed management plan</b> that includes your source waters?		1		
3b. Does the plan include <b>specific prioritized projects</b> , including what agencies have authority to act, and potential funding sources?		1		
3c. Is there an <b>intermunicipal council</b> devoted to implementing the management plan?		1		
3d. Is there an <b>active citizens group</b> focused on protection/restoration of this watershed?	1			
3e. Is there a <b>dedicated source of funding</b> to implement management plan priorities?		1		

### 3a-3b Watershed Management Plan and Projects

There are several small watershed planning efforts for many of the creeks that drain to the Hudson. However, these plans are highly variable in their ultimate goals. In addition, these plans tend to emphasize analysis and evaluation of the watershed over municipal authority to implement specific projects.

Many of these small watershed plans are listed on here:

<http://www.hudsonwatershed.org/local-watershed-groups/watershed-management-plans.html>

Among these plans, the Wallkill and Wappinger Creek, and the Non-Tidal portion of the Roundout Creek plans are detailed, but none focus on source water quality. The Wallkill plan makes general recommendations for improvement, and the Wappinger plan focuses primarily on wetland restoration or protection projects.

Recently (in 2015), a plan was completed for the tidal portion of the Roundout Creek:

<http://www.clearwater.org/pdf/full-reportRCIWMP.pdf>

In addition, a nine-element watershed plan to reduce phosphorus is currently being developed for Wappinger Creek.

### 3c-3e Watershed Plan Implementation

Currently, there is no dedicated funding source or intermunicipal council dedicated to implementing any of the recommendations of the plans described above. However, there are several dedicated citizens' groups, including several small watershed groups, the Hudson River Watershed Alliance (HRWA; a consortium of small watershed groups), Hudson River Sloop Clearwater, the Nature Conservancy, Riverkeeper and Scenic Hudson. The Stormwater Coalition facilitated by the Dutchess County Soil and Water Conservation District acts like an intermunicipal council. However, this group is primarily focused on meeting requirements for municipal stormwater permits.

3.1 Watershed Planning Recommendations

- 15) Hold regular meetings of multiple groups and government agencies interested in protecting Hudson River source waters. This group will serve as stakeholders in the planning process. Members should include municipal representatives and representatives from relevant state and county agencies, including but not limited to Department of Health, the DEC, Department of Transportation, Highway Departments, Soil and Water Conservation Districts, and Cornell Cooperative Extension.
- 16) Secure a source of funding for the planning effort.
- 17) Identify specific goals for the planning effort in stakeholder groups.
- 18) Encourage the development of watershed plans for tributaries within the source water area, and ensure that preservation or improvement of water quality is a goal of each plan.
- 19) Identify specific projects and costs.
- 20) Complete a codes review of all municipalities in the delineated watershed, including those that do not receive water from these plants (Also see Recommendation 24).
- 21) Develop inter-municipal cooperation agreements to manage watersheds whose boundaries extend beyond the limits of the seven Hudson communities.

Section 4. Land Use

Land use regulation is critical to protecting water quality. Although the communities discussed in this report control all the land within their jurisdiction, the total land area draining even to the section of the Hudson upstream and downstream of the intakes is dominated by other jurisdictions.

There are no special interjurisdictional regulations or cooperative agreements to regulate land use. Local jurisdictions regulate land use changes through their Comprehensive Plans. Most of the municipalities we spoke with developed land use plans with primary goals other than water quality. Examples included revitalizing and developing the urban core, and enhancing the waterfront area. These goals are also important and likely improve water quality. However, there is no guiding watershed plan based on water quality improvement that informs land use decisions.

4. Land Use	YES	NO	UNSURE	N/A
4a. Do those who drink the water have <b>jurisdiction over land use decision making</b> in your source watershed?	1	1		
4b. Has the Department of Health promulgated <b>local Watershed Rules and Regulations</b> ?		1		
4c. Are Watershed Rules and Regulations <b>complete and up to date</b> ?				1
4d. Does your municipality have agreements with municipalities in your watershed related to drinking water protection?				1
4e. Is your source watershed designated as a <b>Sole, Primary or Principal Aquifer, a Critical Environmental Area or Special Planning District</b> ?		1		
4f. Do all municipalities in your watershed have <b>local laws protecting streams, wetlands and steep slopes</b> in your source water area?			1	

#### 4.1 Land Use Recommendations

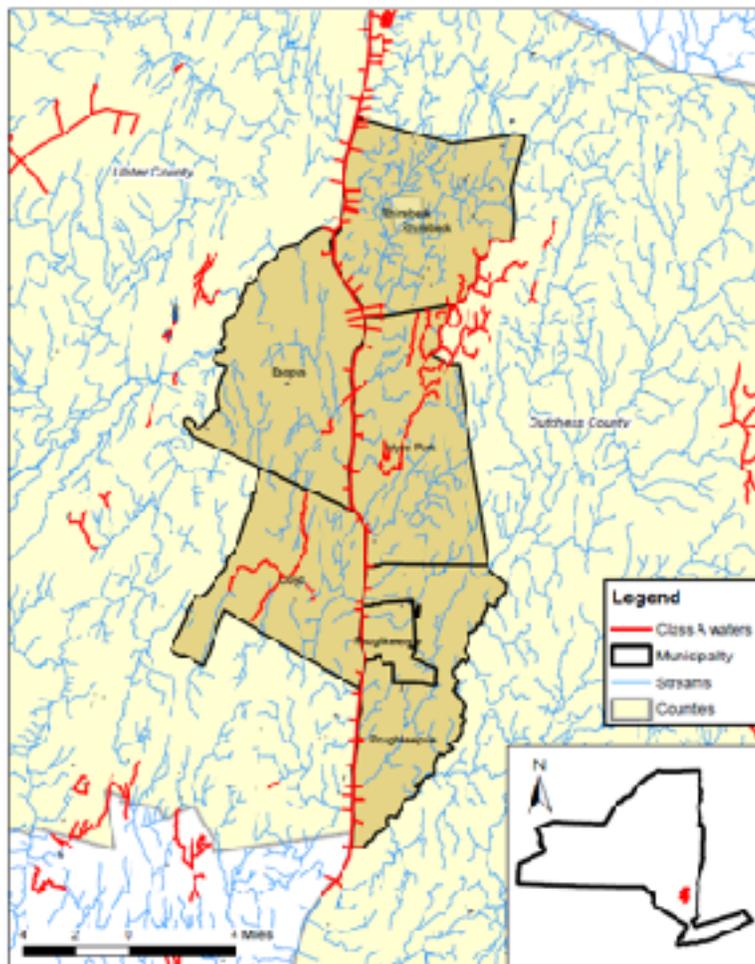
- 22) Work with Dutchess and Ulster Counties to develop comprehensive land use plans at the County scale that reflect watershed goals.
- 23) Designate specific Critical Environmental Areas to protect water quality in the source water area.
- 24) Complete a comprehensive revision of land use regulations and subdivision codes to identify opportunities for improvement. One tool that can be used for this review is the Codes and Ordinances Worksheet (COW). The Hudson River Estuary Program has a New York version at: [www.dec.ny.gov/docs/remediation\\_hudson\\_pdf/cownys.pdf](http://www.dec.ny.gov/docs/remediation_hudson_pdf/cownys.pdf)
- 25) Identify specific code and zoning changes to be consistent with watershed planning goals.
- 26) Work with the state or county departments to implement specific regional rules and regulations
- 27) Request or draft updates to DOH Watershed Rules and Regulations.

#### Section 5. Streams

We completed a brief mapping review of classified streams, and found that (in general), the Hudson River itself in this section *is* classified as Class A, but contributing streams are typically B or C, even if they drain directly to the area near an intake (Figure 1). For this project, we did not have the time to review all permits, but we did review some permits in the DEC NPDES permit database and it appeared based on a sample of individual permits that permit requirements were consistent with the class of water the individual discharged to. Consequently, several class B or C streams are present within the delineated watershed areas on the SWAs.

Although we are not aware of any permit violations, we cannot confirm that all discharges are in compliance.

Currently, there are no special protections in place at the state level; however, several jurisdictions have stream buffer and steep slope provisions to protect streams.



5. Streams	YES	NO	UNSURE	N/A
5a. Are <b>all streams accurately classified</b> to protect drinking water (Class A)?		1		
5b. Are <b>all pollution discharge permits</b> written to protect drinking water use?			1	
5c. Are all pollution discharges in <b>compliance with their permits</b> ?			1	
5d. Are <b>special protections</b> applied to your source waters?		1		

5.1 Stream Recommendations

- 28) Review stream classifications with DEC.
- 29) Complete a review of discharge permits to identify potential violations in the watershed.
- 30) Incorporate special stream protections into local laws.

Section 6. Wetlands

The map layers from DEC indicate that the freshwater wetlands are classified at the same level as the water body that they directly abut. In this section of the Hudson River, this is limited primarily to wetlands that are at the fringe of the Hudson River itself, and does not include upland wetlands. DEC wetlands mapping may not include all freshwater wetlands, but some towns have done some in depth mapping of wetlands areas within the last 10 years. For an example of a wetland mapping effort, consult the Town of Poughkeepsie’s example here: [http://townofpoughkeepsie.com/planning/hudsonia/Significant\\_habitats\\_in\\_the\\_Town\\_of\\_Poughkeepsie.pdf](http://townofpoughkeepsie.com/planning/hudsonia/Significant_habitats_in_the_Town_of_Poughkeepsie.pdf)

6. Wetlands	YES	NO	UNSURE	N/A
6a. Are wetlands <b>accurately mapped</b> in your watershed?	1	1		
6b. Has DEC recently <b>updated freshwater wetlands maps</b> ?		1		
6c. Are <b>small wetlands</b> protected as being of "unusual local importance"?			1	
6d. Are <b>wetlands designated "Class I"</b> as part of drinking water supply?	1	1		

6.1 Wetland Recommendations

- 31) Work with the DEC to update state wetlands maps, and enhance with local wetland maps where possible and as indicated by watershed planning efforts.
- 32) Develop local codes that protect these wetland systems.

### Section 7. Forests and Open Space

The NYS Open Space Conservation Plan sets aside funding to purchase or protect Open Space, and the plan is informed by an advisory committee. The most recent committee report available online was for 2013 (See link below). Although the Hudson Valley is specifically mentioned as a conservation area, the primary goals are agricultural preservation and floodway protection, rather than water quality.

[http://www.dec.ny.gov/docs/lands\\_forests\\_pdf/osp16a.pdf](http://www.dec.ny.gov/docs/lands_forests_pdf/osp16a.pdf)

7. Forests and Open Space	YES	NO	UNSURE	N/A
7a. Have <b>priority lands and forests</b> key to preserving water quality been identified for conservation?	1	1		
7b. Is there a <b>dedicated source of local funding</b> to preserve these lands?	1	1		
7c. Are priority projects <b>eligible for state funding</b> through inclusion in the NYS Open Space Conservation Plan?	1	1		
7d. Do <b>regional sources of open space conservation funding</b> prioritize protection of your source water area?		1		

#### 7.1 Forest and Open Space Recommendations

- 33) Convene local and regional land trusts to discuss and begin to prioritize Source Water Protection needs.
- 34) Building on the proposed watershed planning effort, identify strategic forest and open space preservation areas that would help preserve water quality in the Hudson River.
- 35) Advocate to use NYS Open Space Conservation Plan funds to preserve forest and open space in these strategic locations.
- 36) Revise comprehensive plans to identify priority conservation areas.

### Section 8. Other

This section of the Scorecard focuses primarily on water quality monitoring, outreach and stormwater regulation. The results of this section are mixed, as there is monitoring activity in the watershed, but this could be enhanced with a focus on drinking water sources. In addition, stormwater discharge regulation is not consistent throughout this portion of the Hudson River, with some communities being regulated by and MS4 permit and others exempt.

8. Other	YES	NO	UNSURE	N/A
8a. Is <b>water quality monitored</b> routinely in your watershed?	1			
8b. Are <b>stream assessments</b> accurate and up to date?	1	1		
8c. Do <b>signs mark source water features</b> and borders?		1		
8d. Are <b>stormwater discharges</b> in your watershed regulated?	1	1		
8e. Will you <b>share the results</b> of this scorecard?	1			

**8 a-b. Stream Assessments and Water Quality Monitoring**

*Riverkeeper*

There is an extensive network of monitoring sites in this section of the Hudson River, including several sites on the main stem, as well as a network of citizen monitoring sites in tributaries. A description of these sites, as well as a summary of resulting monitoring data can be found here:

<https://www.riverkeeper.org/water-quality/hudson-river/ulster-dutchess/>

This program monitors for bacteria, salinity, oxygen, temperature, suspended sediment and chlorophyll.

*Hudson River Environmental Conditions Observing System*

This system includes a network of monitoring stations in the entire Hudson River Estuary, with two permanent stations in this section of the Hudson River, at Norrie Point and at Marist College. The focus of these stations is primarily on ecosystem health, with parameters including: acidity, dissolved oxygen, conductance, turbidity, and hydrologic parameters such as depth and velocity. Real time data from these stations can be accessed at: <http://hrecos.org/>

*DEC: Rotating Integrated Basins Studies*

This statewide system is used to assess and classify waters throughout New York State and includes a network of stations used to assess water quality throughout the state. Monitoring includes both routine monitoring to detect trends (primarily including macroinvertebrate sampling), and an Intensive Monitoring Network. The Intensive Monitoring Network includes denser and more comprehensive monitoring and is completed on a five-year rotating cycle. The Lower Hudson River is currently being assessed (2017-2019).

<http://www.dec.ny.gov/chemical/23848.html>

### **DEC Stream Assessment**

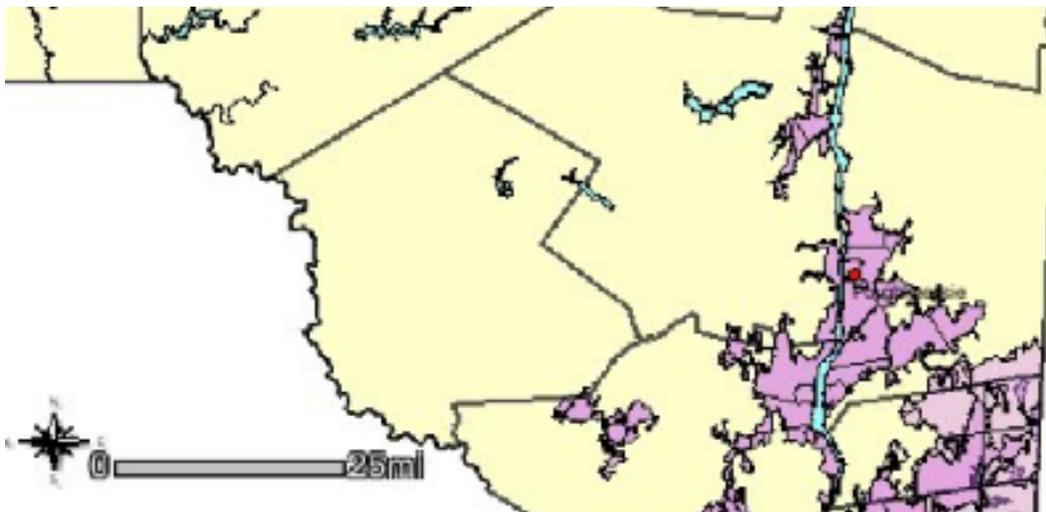
Stream assessments in the Hudson River Basin are mixed. The last comprehensive report summarizing water quality and classifying waters in the Basin was in 2007. However, some specific segments have been evaluated and classified more recently. For example, Esopus Creek was classified in 2017.

### **8 c Signs at Water Features**

Although some signs in the region indicate boundaries of the Hudson River Estuary, there are no signs that indicate watershed boundaries or key features of the Hudson as a Source Water.

### **8 d. Stormwater Regulation**

The New York State SPDES (State Pollution Discharge Elimination System) requires several communities (or MS4s) to implement a program that manages stormwater discharges, including several minimum elements. In New York State, the communities regulated by this rule are defined by Census Urban Areas. This means that there are wide areas of the state with no MS4 regulation, in less populated areas, and a concentration of regulated communities around metropolitan areas. This section of the Hudson River has mixed coverage. For example, of the seven communities reviewed for this report, five have an MS4 permit, including the Town and City of Poughkeepsie, and the Towns of Esopus, Hyde Park and Lloyd. The Town and Village of Rhinebeck are not regulated by an MS4 permit. In addition, coverage is in general “spotty” in communities draining to the Hudson in this area (Figure 2). While there is a population concentration in Poughkeepsie and areas south, many communities that directly drain to this portion of the river are not regulated by an MS4 permit.



*Figure 2. Regulated MS4s in the Lower Hudson.*

### **8.1 Other Recommendations**

- 37) Conduct a comprehensive review of available monitoring data, to include unregulated contaminants.
- 38) Continue ongoing bacteria monitoring.
- 39) Work with the DEC RIBS program to obtain data and participate in the stream assessment process.
- 40) Develop and install signs to identify the Hudson River as a Source Water and install in the watershed immediately draining to drinking water intakes.

- 41) In Dutchess County, MS4 communities cooperate, under the leadership of the Dutchess County Soil and Water Conservation District, to meet the requirements of the MS4 permit. Unregulated communities such as Rhinebeck should consider participating in this group to implement stormwater controls.
- 42) In Ulster County, there is no equivalent forum. Work with Ulster County to establish a similar cooperative group, or consider forming a Hudson River MS4 advisory panel that works with communities throughout the Hudson River.
- 43) Share results of this Scorecard assessment with relevant agencies and municipalities active in the source watershed area.