DELAWARE BASIN WATER POLICY REVIEW

Final Report | June 2017

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WRITTEN BY GAYLE KILLAM AND ELLEN KOHLER.

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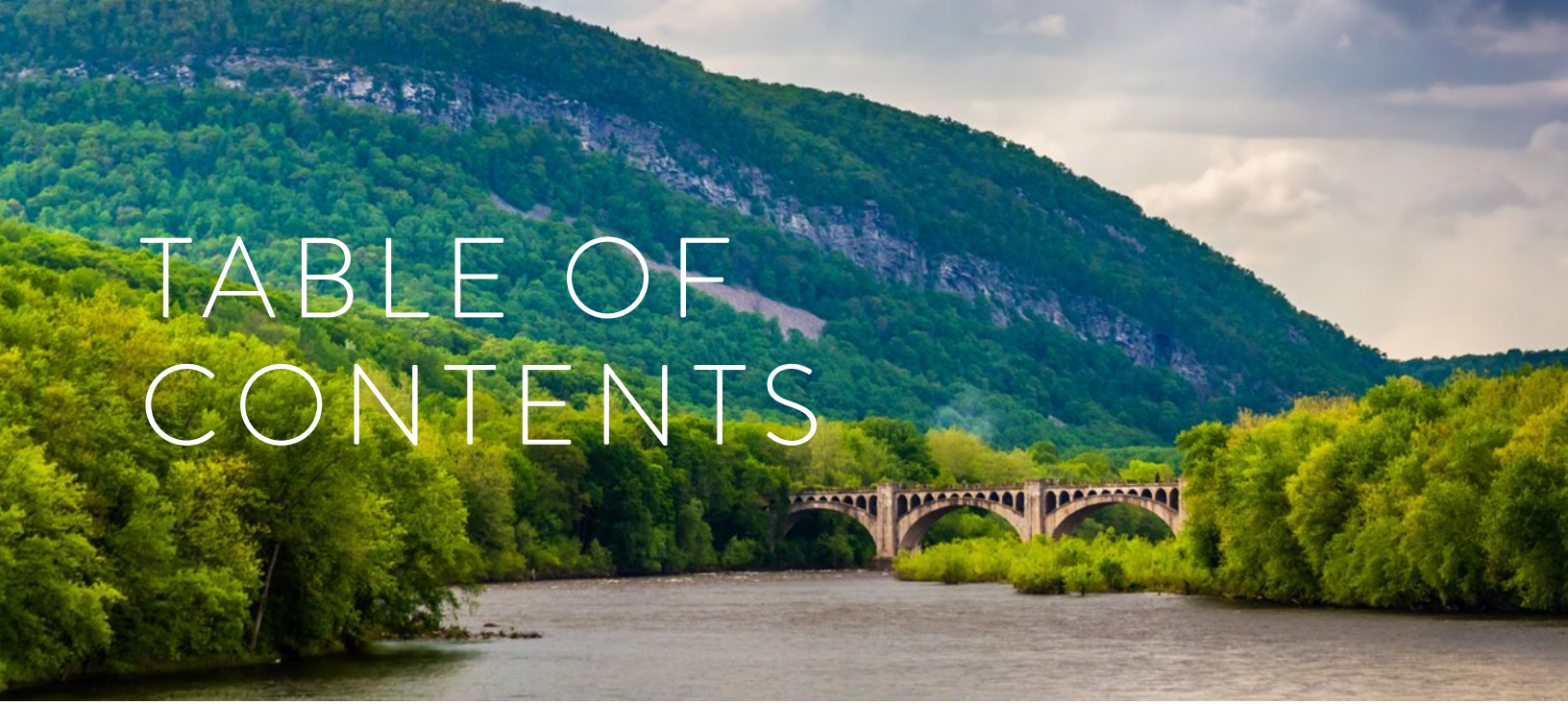

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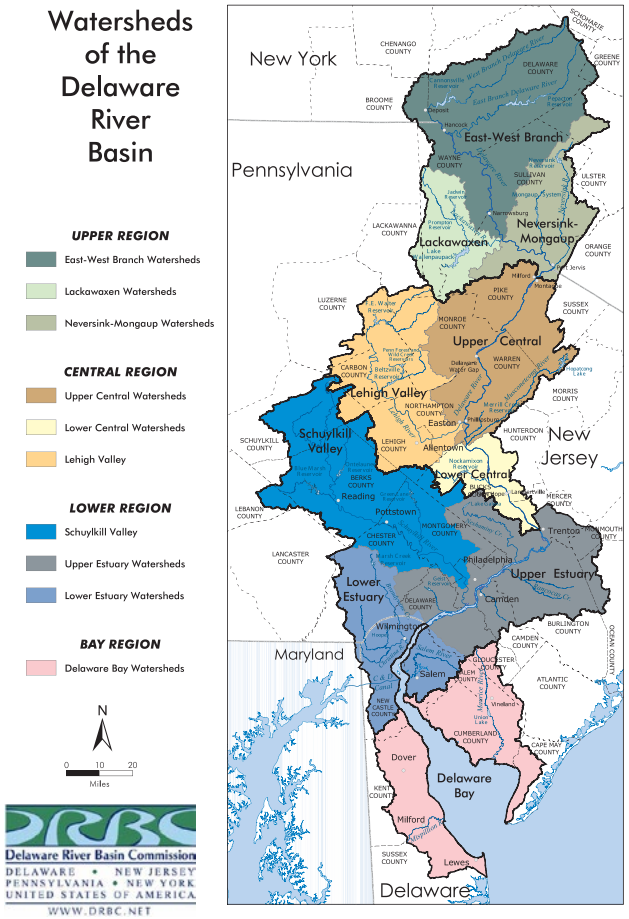
EXECUTIVE SUMMARY

With support from the William Penn Foundation, River Network performed a basinwide comparative analysis of a number of Clean Water Act and Safe Drinking Water Act tools, policies and programs in New York (NY), Pennsylvania (PA), New Jersey (NJ), and Delaware (DE), specifically as they relate to the Delaware River Basin. Our charge was to identify gaps and opportunities for stronger and more effective water programs. We have also examined related programs implemented by the Delaware River Basin Commission.

Due to the limited project period, this examination was, by design, a shallow dive into topics that had basinwide relevance. There is much more to be learned in all of these areas. It is River Network's intention that this project will catalyze discussion, increase coordination and lead to seized opportunities that can improve health of the watershed.

Because the Delaware River flows through four states before reaching the Atlantic Ocean, the water policies developed by each of those states, as well as by the Delaware River Basin Commission (DRBC), have an impact on the river's health and its ability to support sensitive uses in each and every downstream town and city. The cumulative impacts of different land uses that cause nonpoint source pollution, wastewater and stormwater pollution, and loss of wetlands, riparian habitat and buffers are evident in the degraded health of the river and its inhabitants. Better implementation of and increased public involvement in existing water programs can address these impacts.



Map of the Watersheds of the Delaware River Basin.
Source: www.nj.gov/drbc/v=basin/map/

METHODOLOGY

River Network reached out to numerous groups and individuals involved in policy work in the Basin including nonprofits, government agencies, and academics. Through that process we learned a great deal about the Basin: the treasures, the pressures and stressors, different organizations' policy priorities and a bit about the politics around resource management and regulation. We invited individuals from different parts of the Basin who were interested and who could be helpful in the development of our research agenda and its application, to help guide our prioritization and analysis as part of our advisory group.

We selected the following Delaware River Basinwide topics for our research agenda:

1. Improve public engagement
2. Protect high quality
3. Protect drinking water uses
4. Prevent thermal impacts
5. Protect wetlands and riparian areas

For each topic, River Network and its contractors started with online research of statutes, regulations and policies. Based on what we could determine from information that is available online, we developed additional research questions and identified appropriate agency staff for phone research. From those phone conversations, we worked to fill gaps and synthesize the findings below.

River Network has begun to reach out to additional policy groups, agencies and academics working within the Basin to discuss the research and findings, solicit ideas about application and invite them to be involved in the next phase of the work. This phase will include application of the findings and identification of other areas that warrant similar research and basinwide conversations.

[1]Phone interview with John Yagacic, Delaware River Basin Commission, September 28, 2016.

HIGHLIGHTS FROM FINDINGS

The results of the research reveal critical needs in the Delaware River Basin that include improvement of basinwide coordination, data availability, public involvement, and assessment.

Many of the programs that we examined are not set up for easy review at a watershed scale, making analysis challenging. The program areas that report (or collect) information by watershed are water quality standards, impaired waters, and sourcewater protection. On the other hand, the databases of discharge permits, wetland dredge and fill permits, and even the total maximum daily load (TMDL) summaries are more often available only by state. It was therefore difficult to collect information about the implementation of the programs in the Delaware River Basin portions of the states. We compiled the information on a statewide level when it was only readily available in that form.

This research has identified ways that watershed-based data collection could improve awareness, coordination, and program implementation that would greatly benefit the Basin. Examination of each research topic identified opportunities for near-term deeper analysis as well as additional research. There were several opportunities that were similar across all the research topics (see sidebar):

The following highlights and opportunities correspond to the five topics of our research agenda. More details and further explanation of identified opportunities can be found in the Findings and Opportunities section.

Opportunities:

- Improve collection of and access to Basin-specific data and information
- Coordinate upstream and downstream public information, public engagement, and request for comment on changes to standards and permits and basinwide projects
- Communicate and/or coordinate across jurisdictions regarding changes to standards and permits
- Increase role of EPA regions 2 and 3 in the above
- Increase DRBC's role in the above
- Explore DRB-focused virtual policy and law clinic involving area law schools

1. Improve Public Engagement

Every Clean Water Act program requires or allows for public input and comment. As we considered analysis of policy tools across the Basin, it became apparent that it would be equally important to find out whether and how each state and the DRBC are soliciting, receiving and responding to comments from the public. Additionally, we wanted to know which groups are participating in those public comment opportunities so that we would know who is likely to be interested in improving coordination among jurisdictions, sharing of basinwide information, development of consistent standards and increasing basinwide programmatic implementation.

The water programs reviewed, state agency staff consulted and database information analyzed all indicated a low level of involvement by individuals and organizations in the available public comment processes. The high-level review of public involvement identified only a handful of active organizations, often strong, established basinwide

Opportunities: Public Engagement

- Improve access to basinwide data
- Coordinate public review of changes to water quality standards
- Fund increased DRBC coordinating role as One Process/One Permit Program expands
- Develop education/ training on public involvement in water programs

or statewide organizations. River Network knows that there are groups throughout the Basin engaging in policy advocacy at local levels, and perhaps informally at the state level as well. We hope to identify and work with as many of these groups as possible in the coming year.

Our research found little to no coordination among states and the DRBC on public input and comment opportunities related to (a) setting or changing water quality standards through the Triennial Review or (b) assessing use support and impairment for the Integrated Report. Though the Triennial Review and the compilation of the Integrated Report provide regular opportunities for public involvement, participation across the Basin has not been particularly robust—either from individuals or from environmental organizations. Review of and changes to DRBC's water quality standards do not occur on a similarly regular schedule. The DRBC has a Water Quality Advisory Committee that meets periodically, is open to the public and reviews proposed changes to standards. States and the public are invited to comment on any proposed changes to DRBC water quality standards during the rulemaking process.[1]

The National Pollutant Discharge Elimination System (NPDES) program in the Delaware River Basin has matured to the point where most of the permits, besides stormwater permits, are renewals for existing permittees. Because most renewals do not include substantial changes to the facility or the discharge, they do not typically generate much public interest. Staff at the state agencies noted that most of the public activity around new permits is for small wastewater facilities and municipal stormwater permits.

[1]Phone interview with John Yagacic, Delaware River Basin Commission, September 28, 2016.

2. Protect High Quality

The Clean Water Act requires that each state develop its own water quality standards. In doing so, the state must develop an antidegradation policy and implementation procedures to protect existing uses, high quality and outstanding waters.

The DRBC developed a Special Protection Waters (SPW) program to protect the high water quality of the Delaware River from degradation. The entire non-tidal mainstem has been designated either Outstanding Basin Waters or Significant Resource Waters.

All four Basin states also have a process for designating the most outstanding waters in their state. Delaware is the only state that has not exercised that process. The states vary in their requirements for designation, but general categories include waters with specifically defined high quality, waters of ecological or recreational significance, waters in the federal or state wild and scenic program, and waters in state or national parks. The states also vary in their levels of protection once waters are designated as high quality, exceptional or outstanding. These protections are technically supposed to be triggered when a new or increased discharge is proposed that has the potential to degrade designated or qualifying waters. Practically, if it happens, antidegradation is triggered when a permit is sought. In all state and DRBC procedures, there is supposed to be an assessment of necessity of the activity in the proposed location (in the form of an alternatives analysis) as well as an evaluation of the social and economic importance of the activity.

River Network found that the antidegradation process has not been consistently implemented across the states, leaving the Delaware River vulnerable to degradation. Indeed, it does not appear to be implemented in New York at all and in Delaware more than a few times in almost three decades.[2] Coordination of the implementation of the discharge permit programs between the states and DRBC has increased and improved across the Basin as administrative agreements have been developed. While all discharges in the mainstem have to meet the requirements of SPW, DRBC does not get involved in the implementation of state antidegradation procedures.[3] New Jersey and New York are piloting a "One Process/One Permit Program" with DRBC that consolidates the state-implemented Clean Water Act discharge permits with the DRBC-implemented dockets for the same discharges. This program may result in greater sharing of data and consultation about preventing degradation.

Opportunities: High Quality

- Increase communication and coordination about protection across jurisdictions
- Standardize high quality and exceptional/ outstanding designations
- Develop education/ training on SPW and antidegradation

[2]Phone interview with John Defriesce, Delaware Department of Natural Resources and Environmental Control, February 25, 2016.
[3]Phone interview with Dave Kovach, Delaware River Basin Commission, January 11, 2017.

3. Protect Drinking Water

More than 15 million people rely on the Delaware River Basin for drinking water. There are 38 large public water supply systems in the Basin, which represent 80% of the total public water supply withdrawals. The combination of home domestic wells (114 million gallons per day (MGD)) and surface and groundwater public supply withdrawals (863 MGD) result in 13% of total daily water use in the Delaware River Basin.[4]

Because of this dependence on the watershed for one of the most sensitive uses, River Network decided to examine how well states document and make available information on delineated sourcewater areas, wellhead recharge and protection areas, and drinking water intakes, and whether, and to what extent, drinking water uses are considered in regulatory decisions.

River Network examined sourcewater protection across the four Basin states. Each state provides GIS layers; New Jersey and Delaware make available to the public the best mapping of sourcewater and wellhead protection areas.

Each state as well as the DRBC has developed at least one use category associated with potable water uses. All jurisdictions appear to apply the potable water use category widely, if not to almost all waters in the state.

DRBC pays attention to drinking water in several ways: through monitoring of uses and stream quality objectives, early warning, response and modeling of spills and water quality events[5], and by preventing salt water intrusion into the Philadelphia-area drinking water intakes by requiring sufficient flow at Trenton. In addition, water supply is one of the stated criteria for assigning a Special Protection Waters designation. Recently, the Commission has been asked to get more involved in basinwide sourcewater protection.[6]

The Clean Water Act is not considered the primary tool for protection of drinking water resources, however, the Clean Water Act requires designation of uses of all surface waters, including public water supplies and other potable uses. Those uses must be (a) protected by water quality criteria and NPDES permit limits, (b) included in the Integrated Report (which tracks use support and impairments), and (c) taken into consideration when Total Maximum Daily Loads are written and implemented.

Opportunities: Drinking Water

- Map sourcewater areas across Basin
- Track water supply impairments basinwide
- Coordinate protection of vulnerable areas
- Develop education/ training on CWA tools to protect drinking water

[4]Sayers, D.A., T.K. Barr. "Chapter2 – Water Quantity" in the Technical Report for the Delaware Estuary and Basin. Partnership for the Delaware Estuary. PDE Report No. 12-01. June 2012. Pp. 48-62, http://www.state.nj.us/drbc/library/documents/TREB-PDE2012/Ch2-water-quantity.pdf

[5]Email, John Yagecic, Delaware River Basin Commission, March 16, 2017.

[6]Phone interview with Bill Muszynski, Delaware River Basin Commission, March 21, 2016.

4. Prevent Thermal Impacts

Throughout the Basin, there are uses that are directly sensitive to higher temperatures (e.g., aquatic life) or indirectly to the impacts of higher temperatures such as bacteria or algal growth (e.g., public water supplies, recreation). The need to protect these uses provides a good reason to set protective standards, monitor status and trends, and incorporate standards into permits and restoration plans.

The cold water in the Upper Delaware, below the drinking water reservoirs for New York City, for example, supports a blue-ribbon trout fishery that draws scores of sport fishing enthusiasts each year who spend $21 million annually in Pennsylvania, New Jersey, and New York.[7]

River Network examined the state and DRBC temperature standards to compare how desired instream temperatures are defined. Awareness of human-related thermal contributions to the Basin will be an increasingly important component of improving resiliency to climate change.

River Network found that neighboring states along the same stretch of river have different standards, and that each state defines impairment differently. For all states, however, impairment always requires more than one exceedance. DRBC temperature criteria in the non-tidal mainstem are focused on point sources, and in the estuary, they are focused on daily differences.[8]

DRBC summarized temperature monitoring data throughout the Basin from USEPA and USGS in the most recent 2012 State of the Estuary/State of the Basin report (an update is forthcoming). Upstream water temperatures are influenced by reservoir operations, whereas estuary water temperatures are influenced by tides, meteorological forces, and municipal and industrial thermal loads.[9]

This review did not include a detailed look at how the states address temperature in individual NPDES permits. From what we found, temperature effluent limitations are not common in the Delaware Basin, but that would need more investigation. Further, because it appears that there are no TMDLs that explicitly address temperature in the Basin, it was difficult to identify, not to mention compare, the regulatory approaches to temperature impairments across the Basin.

Opportunities: Thermal Impacts

- Examine different temperature criteria
- Map temperature impairments throughout Basin
- Summarize existing temperature monitoring from all sources
- Improve basinwide understanding of thermal impacts

[7] www.TU.org

[8] Phone interview with John Yagecic, Delaware River Basin CommissionDRBC, September 28, 2016.

[9] Partnership for the Delaware Estuary. 2012. Technical Report for the Delaware Estuary and Basin. PDE Report No. 12-01, 89.

5. Protect Wetlands and Riparian Areas

The Clean Water Act, section 404 and the Rivers and Harbors Act, section 10, require permits for activities that involve dredging or filling and putting structures in wetlands or anywhere in waters of the U.S. The authority for these permits is primarily with the U.S. Army Corps of Engineers (Corps), however, the state of New Jersey has assumed authority for most of the 404 program within its boundaries from the Corps. The other Basin states have also developed their own programs to protect wetlands and limit activities that alter streams, however, Delaware's program only applies to tidal wetlands.

The Philadelphia District of the Corps lists all individual permits on their website. These permits have included utility projects (including pipelines), maintenance dredging, marinas and docks. Staff noted that they only occasionally get requests for a public hearing during the permit review process, and most permits do not attract many comments. Larger projects and Nationwide Permits (general permits drafted once every five years at the national level), tend to attract comments, particularly from groups like the Delaware Riverkeeper Network.[10] The New York District retains permit information on its website for two years. In 2012, the most recent information available, there were no individual permits issued in their part of the Delaware Basin.[11]

Because of the varying approaches to wetland and riparian permitting in each state and the involvement of two districts of the US Army Corps of Engineers (Corps) and two regions of the Environmental Protection Agency (EPA), it is difficult to track and compare wetland programs across governmental agencies. This management matrix also makes it difficult to assess cumulative impacts of the various permitting processes on wetlands and other aquatic resources in the Basin.

Another section of the Clean Water Act, section 401, provides states and tribes with an opportunity to review and certify federal permits issued within their jurisdiction. A federal agency cannot issue a permit or license for an activity that may result in a discharge (such as the section 404 and section 10 permits) until the state or tribe reviews whether the activity will violate its water quality standards (or waives its right to review). The state or tribe can grant certification, grant certification with conditions, deny certification, or waive the need for certification.

Opportunities: Wetlands/Riparian Areas

- Examine impacts of the most-used NWPs in the Basin
- Promote wetland-specific water quality standards
- Examine patterns of 401 waivers
- Develop education/ training on 404/401 review

[10]Phone interview with, Lou Cattuna, NJDEP and Glen Weitknecht, USACE, Philadelphia District, May 2016.

[11]See USACE New York District website at http://www.nan.usace.army.mil/Missions/Regulatory/Permit-Decisions/.

From the review conducted, it does not appear that the four states in the Basin take full advantage of the section 401 certification process to protect water quality. Resource constraints are often the primary reason stated for the minimal use of the section 401 review. The public can only comment on the state water quality certifications that the state completes. Therefore, if the state does not perform the review, there isn't anything for the public to comment on.

None of the states have wetland-specific water quality criteria or designated uses. Therefore, whether projects are going to violate water quality standards has to do with the uses and criteria established for streams and lakes. However, Pennsylvania's antidegradation requirements allow for the designation of wetlands as Exceptional Value Waters[12] and wetlands have been so designated. In Pennsylvania, a section 401 certification should involve examination of any potential impacts to designated Exceptional Value wetlands.

CATALYZING CHANGE

River Network's examination of water quality programs in the Basin has identified a great need and an opportunity to enhance Basin awareness, program implementation and permit compliance through greater coordination around data, standards, permitting and public engagement. Upon completion of this phase of research, River Network began to reach out to additional policy groups, agencies and academics working within the Basin to discuss the research and findings, dive deeper into the specific programs, solicit ideas about priorities for greater coordination and invite them to engage in the next phase of our work.

River Network hopes this examination will catalyze a more detailed examination of water quality programs throughout the Basin beyond our capacity. We intend to work in partnership with policy and legal NGOs, academic institutions, local, state, federal agencies and DRBC to improve understanding of, coordination among and communication across interrelated water quality programs with basinwide implications.

[12]PA Water Quality Standards, Chapter 93.

INTRODUCTION

With support from the William Penn Foundation, River Network performed a basinwide comparative analysis of a number of Clean Water Act and Safe Drinking Water Act tools, policies, and programs in New York (NY), Pennsylvania (PA), New Jersey (NJ), and Delaware (DE), specifically as they relate to the Delaware River Basin. Our charge was to identify gaps and opportunities for stronger and more effective water programs. We have also examined related programs implemented by the Delaware River Basin Commission (DRBC).

The Delaware River is the longest free-flowing river east of the Mississippi. It spans 330 miles from the confluence of its East and West branches at Hancock, N.Y. to the mouth of the Delaware Bay where it meets the Atlantic Ocean. The Basin drains 13,539 square miles; the greatest area drains from Pennsylvania, then New Jersey, New York, and Delaware.[13] This information is relevant when considering the relative regulatory roles of each state. Nearly 150 miles of the Basin (3/4 of the non-tidal Delaware River), including three sections of the mainstem and 28 miles of selected tributaries, are now included in the National Wild and Scenic Rivers System.[14]

The river supports an incredible diversity of mammals, birds, fish and plants. Uses range from the blue ribbon cold water fishery below the dams in New York and Pennsylvania to drinking water for Trenton and Philadelphia, to the largest freshwater port in the world in the Delaware estuary.

Because the Delaware River flows through four states before reaching the Atlantic Ocean, the water policies developed by each one of those states, as well as by the Delaware River Basin Commission (DRBC), have an impact on the river's health and its ability to support sensitive uses in each and every downstream town and city. The cumulative impacts of different land uses that cause nonpoint source pollution, wastewater and stormwater pollution, and loss of wetlands, riparian habitat and buffers are evident in the degraded health of the river and its inhabitants.

[13]DRBC website, **http://www.state.nj.us/drbc/basin/**.
[14]DRBC website, Ibid.

There are many large river basins, lakes or bays in the country that similarly drain multiple states. The best known are the Mississippi River, the Chesapeake Bay, the Great Lakes, the Columbia River, and the Colorado River. While each of these Basins and many more face similar challenges in setting complementary and coordinated standards and managing regulatory programs that affect the same waters, only a handful of basinwide authorities such as the Delaware River Basin Commission have been established to address water quality and quantity issues. Examples of other Basins with such authorities include the Ohio River, the Great Lakes, the Potomac River, the Connecticut River, the Colorado River, the Susquahanna River, the Alabama-Coosa River system, and the Appalachicola-Chaata-Flint River system. Authorities and regulations were set up to guide development and/or activities in ways that are protective of the health of the waterway. In different ways, these compacts all attempt to coordinate across jurisdictions, assess conditions, regulate activities and enforce requirements.

Table 1: Interstate River Basin Compacts in the United States[15]
(ICWP 2002, Cech 2005, USFWS 2005, GAO 2007, and Abdalla 2010)

ADOPTED	RIVER	STATES	PURPOSE
1783	DELAWARE	NJ, PA	NAVIGATION
1783	POTOMAC	MD, VA	NAVIGATION/FISHING
1922	COLORADO	WY, CO, UT, NM, AZ, NV, CA	WATER QUANTITY
1923	SOUTH PLATTE	NE, CO	WATER QUANTITY
1939	RIO GRANDE	CO, NM, TX	WATER QUANTITY
1940	POTOMAC	MD, PA, VA, DC	WATER QUALITY
1948	OHIO	IL, IN, KY, OH, NY, PA, VA, WV	WATER QUALITY
1949	CONNECTICUT	CT, MA, NH, VT	FLOOD CONTROL
1961	DELAWARE	DE, NJ, NY, PA	WATER DEVELOPMENT
1970	SUSQUEHANNA	MD, NY, PA	QUANTITY/FLOODING
1999	ALABAMA-COOSA	AL, FL, GA	WATER QUANTITY
2008	GREAT LAKES	IL, IN, MI, MN, NY, OH, PA, WI, OT	WATER QUANTITY[16]
2013	APALACHICOLA-CHAATA-FLINT	AL, FL, GA	WATER QUANTITY

[15]Kaufman, Gerald, J., Jr. *Governance, Policy and Economics of Clean Water in the Delaware River*, 2014, p.32.

[16]The Great Lakes Compact that was adopted in 2008 governs water quantity in the Basin states and Ontario. This table was corrected from its original.

The creation of the Delaware River Basin Commission (DRBC) in 1961 was indeed a "breakthrough in water resources management,"[17] however, the subsequent passage of current Clean Water Act (1972, 1977, 1981, 1987) and Safe Drinking Water Act (1974, 1986, 1996) statutes and adoption of implementing regulations have resulted in dramatically different requirements across the Basin.

The Delaware River Compact and the Flexible Flow Management Program (water supply agreement among the Basin states and New York City) instigated and have perpetuated a significant level of communication and coordination among the Basin states, the federal government, and New York City that is enviable by other medium and large multi-state Basins. Nevertheless, a focused mission and limited resources prevent DRBC from playing a broader standard-setting, permitting, public involvement and compliance role in the Basin. Greater awareness of implementation and enforcement differences across the state and federal authorities, can result in stronger advocacy for parity, ideally lifting the bar across the Basin regarding consistent protective standards, programs, and practices.

This research identifies opportunities within the Delaware River Basin that could have relevance for management of any waterbody that flows between and through multiple jurisdictions.

[17]DRBC website, **http://www.nj.gov/drbc/about/**

RESEARCH TOPICS

River Network reached out to numerous groups and individuals involved in policy work in the Basin including nonprofits, government agencies, and academics. Through that process we learned a great deal about the Basin: the treasures, the pressures and stressors, different organizations' policy priorities and a bit about the politics around resource management and regulation.

We invited individuals from different parts of the Basin who were interested in and could be helpful in the development of our research agenda and its application to be part of our advisory group. That advisory group helped guide our prioritization and analysis, and it included: Tracy Carluccio (Delaware Riverkeeper Network), Carol Collier (Academy of Natural Sciences at Drexel University), Liz Deardorff (American Rivers), Brenna Goggin (Delaware Nature Society), Jeff Skelding (Friends of the Upper Delaware River), Kim Beidler and Madeline Urbish (Delaware River Basin Coalition) and Dan VanAbs (Rutgers University).

As River Network reached out across the Basin, we asked each person where basinwide water policy coordination was needed most. These conversations help to build and confirm the list of criteria for selection of the project's research topics.

Based on the criteria (see sidebar), River Network focused our basinwide analysis on the following areas and research questions. For each topic, River Network and its contractors started with online research of statutes, regulations and policies. Based on what we could determine from information that is available online, we developed additional research questions and identified appropriate agency staff for phone research. From those phone conversations, we worked to fill gaps and synthesize the findings in the next section.

Criteria:

- Has the topic been recommended?
- Does the topic have a basinwide relevance?
- Is the topic timely and/or ripe?
- Is there a good example—inside or outside the Basin—that is worth replicating?
- Is there relevance to the Delaware Watershed Initiative?
- Are the politics supportive and/or ripe for change?
- Would this analysis be duplicative of other efforts?
- Would this analysis be useful to NGOs and/or agencies in their efforts?
- Can the topic be tackled sufficiently during our project period?

More detail on each topic is provided in the following section on Findings and Opportunities.

1. Improve Public Engagement

Every Clean Water Act program requires or allows for public input and comment. As we considered analysis of policy tools across the Basin, it became apparent that it would be equally important to find out how each state and the DRBC are soliciting, receiving and responding to comments from the public. Additionally, we wanted to know which groups are participating in those public comment opportunities so that we would know who is likely to be interested in improving coordination among jurisdictions, sharing of basinwide information, development of consistent standards and increasing basinwide programmatic implementation.

The Triennial Review is intended to be a periodic review of all components of water quality standards (designated uses, water quality criteria and the antidegradation policy and procedures), and it is supposed to include a public process. Between Triennial Reviews, citizens can petition for changes to particular elements of the water quality standards. The Integrated Report is a biennial submission due from the states to EPA in April of every even year. This report includes two previously separate reports named for the sections of the Clean Water Act that dictate their contents: 305(b) report of state water quality and the 303(d) list of threatened and impaired waters. The regulations require that the public be given a chance to contribute to, review and comment on the Integrated Report. DRBC produces a Water Quality Assessment Report biennially for the mainstem, without the listing of impairments. Their public review requirements are…[18]

National Pollutant Discharge Elimination System (NPDES) permits are required for all point sources of pollution. There is a distinct difference in the opportunities for public comment between individual and general permits. Individual permits typically allow for a 30-45 day comment period on a specific facility's pollutant limits and required best management practices when the permit is initially developed or reviewed and revised every five years. General permits, on the other hand, allow a review every five years of the programmatic requirements for a particular category of activities. In many cases, such as stormwater, the general permit categories are extremely broad and not particularly well-suited for controlling the discharged pollutants. DRBC develops pollution limits for dischargers into the mainstem called "dockets" on a five-year period as well, and there are public opportunities for comment.

Research Questions:

- What are the meaningful opportunities for public review and comment (and to propose changes) across the fundamental Clean Water Act programs (water quality standards, NPDES permits, impaired waters, TMDLs and dredge and fill permits)?
- Which environmental organizations are taking advantage of those opportunities?
- How are groups and the general public informed and/or trained on Clean Water Act programs?

[18]Phone interview with John Yagecic, Delaware River Basin Commission, September 28, 2016.

2. Protect High Quality

The Clean Water Act requires that each state develop its own water quality standards. In doing so, the state must develop an antidegradation policy and implementation procedures to protect existing uses, high quality and outstanding waters. This policy is primarily implemented (or intended to be) through the NPDES program and state water quality certification, though there are other ways that it can be triggered.

The DRBC developed a Special Protection Waters (SPW) program to protect the high water quality of the Delaware River from degradation. The entire non-tidal mainstem has been designated either Outstanding Basin Waters or Significant Resource Waters. This program is implemented through limits in dockets based on models that examine potential impacts of any discharge at Boundary and Interstate Control points. If the model results show that the discharge will not cause a measurable change at the Control Points, the dockets are generally approved with assumptions that they will not violate the requirements of the Special Protection Waters designation.[19]

Research Questions:

- How has each state developed the core elements of the antidegradation program?
- How do they differ?
- How does the DRBC implement the Special Protection Waters program across the Basin?
- Is there any coordination or conflict?

[19]Phone interview with Dave Kovach, Delaware River Basin Commission, January 11, 2017.

3. Protect Drinking Water

More than 15 million people rely on the Delaware River Basin for drinking water. There are 38 large public water supply systems in the Basin, which represent 80% of the total public water supply withdrawals. Easton and Philadelphia, PA and Trenton, NJ are the primary cities in the Basin that provide surface water to residents. The combination of home domestic wells (114 MGD) and surface and groundwater public supply withdrawals (863 MGD) result in 13% of total daily water use in the Delaware River Basin.[20]

Because of this dependence on the watershed for one of the most sensitive uses, we decided to examine how well states document delineated sourcewater areas, wellhead recharge/protection areas and drinking water intakes and whether, and to what extent, drinking water uses are considered in regulatory decisions. We also examined the roles DRBC plays in the protection of sourcewater.

The Clean Water Act is not considered the primary tool for protection of drinking water resources since the Safe Drinking Water Act requires monitoring of contaminants of concern, public notification of monitoring results and planning for protection of sourcewater. However, the Clean Water Act requires designation of uses of all surface waters, including public water supplies and other potable uses. Those uses must be (a) protected by water quality criteria and NPDES permit limits, (b) included in the Integrated Report (which tracks use support and impairments), and (c) taken into consideration when Total Maximum Daily Loads are written and implemented.

Research Questions:

- How has each state addressed sourcewater protection planning requirements under SDWA?
- Do the states or DRBC maintain GIS layers of sourcewater or wellhead protection areas or water supply intakes?
- If so, are they consulted or employed during regulatory decisionmaking?

[20]Sayers, D.A., T.K. Barr. "Chapter2 – Water Quantity" in the Technical Report for the Delaware Estuary and Basin. Partnership for the Delaware Estuary. PDE Report No. 12-01. June 2012. Pp. 48-62, http://www.state.nj.us/drbc/library/documents/TREB-PDE2012/Ch2-water-quantity.pdf

4. Prevent Thermal Impacts

Throughout the Basin, there are uses that are directly sensitive to higher temperatures (e.g., aquatic life) or indirectly to the impacts of higher temperatures such as bacteria or algal growth (e.g., public water supplies, recreation). The need to protect these uses provides a good reason to set protective standards, monitor status and trends, and incorporate standards into permits and restoration plans.

The cold water in the Upper Delaware, below the drinking water reservoirs for New York City, for example, supports a blue-ribbon trout fishery that draws scores of sport fishing enthusiasts each year who spend $21 million annually in Pennsylvania, New Jersey, and New York.[21]

Greater awareness of human-related thermal contributions to the Basin is an important component of improving watershed resiliency to the impacts of climate change.

Research Questions:

- What are the different state and DRBC water quality standards for temperature?
- How are they used in the development of NPDES permits and DRBC dockets?
- Do the states monitor and report temperature impairments? Does DRBC?
- Have any of the states developed temperature TMDLs? How are temperature impairments addressed?

[21]Trout Unlimited (www.tu.org).

5. Protect Wetlands and Riparian Areas

Across the Basin, wetland acreage has declined substantially. The following historic wetland acreages lost were reported by the Association of State Wetland Managers in 1989:

Delaware	54%	New Jersey	39%
New York	60%	Pennsylvania	56%[22]

Given the role wetlands play including filtering freshwater resources and helping to retain floodwaters, these losses were significant then, and are unfortunately worse today. The Partnership for the Delaware Estuary (PDE) reported in 2016 that an acre of coastal wetlands were being lost every day. Erosion is a leading symptom of that loss when there isn't sufficient accretion to balance the loss. PDE also reported that the remaining coastal wetlands are moderately to severely stressed due to development and sea level rise, among other factors.[23]

The Clean Water Act, section 404 and section 10 of the Rivers and Harbors Act require permits for activities that involve dredging and the discharge of dredged or fill material from wetlands or anywhere else into waters of the U.S.

The majority of section 404 permits are general permits called Nationwide Permits (NWP). As of March 2017, there are 52 categories of activities that are included in this program. Similar to the differences mentioned above between general and individual NPDES permits, individual 404 permits are specific to a particular project and allow for a much more thorough public review process, whereas, the Nationwide Permits set requirements for broad categories of activity, and are only open for public review and comment once every five years. State programmatic general permits (SPGP) are another version of general permits that are more specific to the state, but they can suffer from the same general permit shortcomings when it comes to public review and comment.

Another section of the Clean Water Act, section 401, provides states and tribes with an opportunity to review and certify federal permits issued within their jurisdiction. A federal agency cannot issue a permit or license (such as the 404 permits mentioned above) for an activity that may result in a discharge until the state or tribe reviews (or waives its right to review) whether the activity will violate state water quality standards. The state or tribe can grant certification, grant with conditions, deny certification, or waive the right to certify the activity. The states have the privilege every five years to certify, condition, or deny each of the Corps' Nationwide Permits. The states also have the right to the same review for every individual 404 permit issued.

Research Questions:

- How is wetland/riparian (section 404 dredge and fill) permitting carried out by each state and the Corps?
- Does each state exercise its right to review 404 permits for consistency with their water quality standards?
- What are the public opportunities for review and comment in these programs?

[22]Association of State Wetland Managers, Delaware, New Jersey, New York and Pennsylvania State Wetland Program Summaries, August 31, 2015.

[23]Kreeger, Danielle. "Decade of Research Shines Light on Wetland Loss," Partnership for the Delaware Estuary, Estuary News, Winter 2016, Vol. 26, Issue 2, pp4-5.

FINDINGS AND OPPORTUNITIES

The results of the research reveal increased interest in the Delaware River Basin as well as significant gaps in data and information availability. There is a critical need for greater public involvement in water programs as well as for improved coordination of monitoring of cumulative impacts of activities in the Basin.

Many of the programs that we examined are not set up for easy review at a watershed scale, making analysis challenging. The program areas that are reported (or collected) by watershed are water quality standards, impaired waters, and sourcewater protection. On the other hand, the databases of discharge permits, wetland dredge and fill permits, and even the TMDL summaries are more often available only by state. It was therefore difficult to collect information about the effectiveness of the programs in the Delaware River Basin portions of the states or to assess the interaction of the same programs across the states. Where necessary, we compiled the information on a statewide level because it was readily available in that form. This research has identified ways that watershed-based data collection could improve awareness, coordination, and program implementation that would greatly benefit the Basin. Each research topic presented some unique opportunities for near-term deeper analysis as well as additional research. There were several opportunities that were similar across the research topics (see sidebar). More detailed findings within each topic follow.

Opportunities:

- Improve collection of and access to Basin-specific data and information
- Coordinate public information, engagement, and comment for standards and permit changes and basinwide project applications (i.e., pipeline crossings)
- Communicate and/or coordinate across jurisdictions regarding changes to standards and permits
- Increase role of EPA regions 2 and 3 in the above
- Increase DRBC's role in the above
- Explore development of DRB-focused virtual law clinic across law schools

1. Improve Public Engagement

Public review of and comment on water policy programs and tools is critical to ensuring that the programs are fully protecting the uses of the Basin. Public comments also serve as a check and balance on the agency efforts. The water programs reviewed, state agency staff consulted and database information analyzed all showed a low level of involvement by individuals and watershed organizations in the available public comment processes. The Delaware River Basin Commission's website lists more than 100 organizations in the Basin. The Delaware River Watershed Initiative includes 37 organizations across eight subwatersheds. Yet, the high-level review of public involvement identified only a handful of active organizations, often strong, established basinwide or statewide organizations, many of which are also local affiliates of national organizations such as the Waterkeeper Alliance, The Nature Conservancy, Trout Unlimited, and the Center for Biological Diversity. River Network knows that there are groups throughout the Basin engaging in policy advocacy at local levels, and perhaps informally at the state level as well. We hope to identify and work with as many of these groups as possible.

Because this section presents distinct findings related to different CWA tools, the findings are summarized by program or tool.

1.A. Triennial Review, Impaired Waters, Restoration Plans

Our research found little to no coordination among states and the DRBC on public input and comment opportunities related to setting or changing water quality standards through the Triennial Review or assessing use support or impairment for the Integrated Report. Though the Triennial Review, the Integrated Report and the 303d list development provide regular opportunities for public involvement, participation across the Basin has not been particularly robust—from individuals or environmental organizations (Figure 2). Some of the departments' websites give good, clear explanations of how the water quality standards are related to the assessments and how permitting programs are designed to help meet the standards that are found in the assessments. Nonetheless, most organizations and individuals lack the necessary scientific training to comment on whether a particular standard is appropriate or whether an assessment method is valid.

Clean Water Act: Public Involvement

"Public participation in the development, revision, and enforcement of any regulation, standard, effluent limitation, plan, or program established by the Administrator or any State under this chapter shall be provided for, encouraged, and assisted by the Administrator and the States. The Administrator, in cooperation with the States, shall develop and publish regulations specifying minimum guidelines for public participation in such processes."
(CWA, section 101(e))

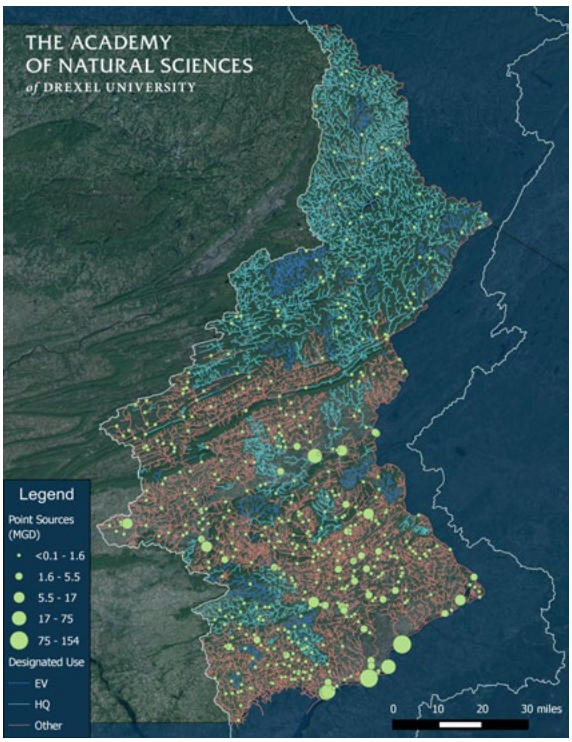
Public comment opportunities:

- **Triennial Review**–regular review of all aspects of the state's water quality standards
- **Petition**–between triennial reviews, the public is entitled to petition for changes to water quality standards.
- **Impaired Waters List (CWA, section 303(d))**–input to biennial listing of impaired water segments.
- **Integrated Report**–combines biennial reports for sections 303(d) and 304(b) (health of all waters)
- **Total Maximum Daily Loads (TMDLs)**–restoration plans required for impaired waters

Figure 1: Public Engagement–Triennial Review and Integrated Report

JURISDICTION	TRIENNIAL REVIEW		INTEGRATED REPORT AND 303d LIST		
	DATE OF LAST COMPLETED REVIEW	# OF COMMENTS	CURRENT REPORT	# OF COMMENTS ON METHODS FOR LISTING	# COMMENTS ON REPORT AND LIST
Delaware	2014	0	2014	0	0
New Jersey	2010	N/A	2014	5	Comment period closed march 2016
New York	2008	27	2014	"a couple hundred"	20
Pennsylvania	2013	197	2014	8	6

1.B. Discharge Permits



Point source discharges in the Delaware River Basin.
Source: Academy of Natural Sciences

For discharges into the Delaware River, states and the DRBC are required to review activities and issue pollution limits for the discharges in National Pollutant Discharge Elimination System (NPDES) permits and DRBC dockets[24], respectively. Based on the Delaware River Basin Compact, DRBC reviews projects that are deemed to have a "substantial effect upon water resources of the Basin."[25] Administrative agreements have been developed between DRBC and each Basin state to clarify responsibilities and coordination on discharge permitting. For example, in the current agreement

[24]Dockets are developed by DRBC to define pollution controls for every discharge of 50,000 gallons or more per day into the mainstem (10,000 gpd for Special Protection Waters).
[25]Delaware River Basin Compact, section (symbol) 3.8 (1961), 11.

with Delaware, projects fall in one of six categories that determine who is the lead and how the other jurisdiction offers input.[26] During the last two years, to address the duplication of the state and DRBC permits, New Jersey and New York entered into new agreements with DRBC establishing a "One Process/One Permit" pilot program.

Across all four states, staff at the permitting agencies stated that there is not much public involvement in the NDPES permitting process, regardless of the type of facility being permitted. The majority of permits are renewals that have been issued in the past and are now being reviewed and renewed without substantial changes as the five-year permits end. According to agency staff, the most public comment activity around NPDES permitting involves municipal stormwater (MS4) permits and small wastewater treatment facilities.

Across the Basin, as additional communities are brought into the MS4 permitting process, local, state and regional organizations have become significantly involved in promoting better control of polluted stormwater. Litigation in Pennsylvania resulted in the PA Department of Environmental Protection revisiting how it manages the MS4 program. PADEP has revised the permit required for small MS4s (required for communities with population between 50,000-100,000), and it will take effect in March 2018. New York has recently adopted a new MS4 general permit, while New Jersey and Delaware are in the process of revising and updating their MS4 general permits. Because stormwater is widely seen as one of the most important vectors for pollutants entering rivers and streams, these permit processes provide important opportunities for public engagement in establishing standards and procedures that will improve water quality across the Basin. This is especially true for the small MS4 general permits because the public review occurs, at best, every five years, and the general permits must account for all the differences among communities in that category.

Delaware and New Jersey were able to share lists of NPDES permits by watershed, though New Jersey does not provide that on their website. Both New York and Pennsylvania list permits by county and facility on the web. DRBC provides an interactive map of the location and types of the dockets that are active or under review. They also provide a list of the Notices of Applications Received (NAR), as well as the dockets themselves, through an interactive map on their website.[27] None of the states provide the full permits via the web; they can be obtained through visits to the agency or records request of varying formality.

1.C. Law Schools in Basin

The above high-level review of selected Clean Water Act programs reveals that, in general, there has not been robust engagement in the available public participation processes much beyond a handful of established organizations. There could be several

Clean Water Act: Discharge Permits

National Pollutant Discharge Elimination Permits are required for any point source discharges.

40CFR122.1(b)(1)

Opportunities for public input include:

- Before the permit is drafted
- While the permit is being drafted
- After the draft permit is released (typical comment period is 30-45 days)
- Appeal of permit (administratively or in court, depending on state)
- Modification of permit (change in standard or TMDL)

[26] Administrative Agreement Between DRBC and DENREC, July 2010, amended May2013.

[27] http://drbc.maps.arcgis.com/apps/MapSeries/index.html?appid=5fc49727a2f24c70befcc651d33acbc4

reasons for this lack of participation, including a lack of training about these processes and how to participate effectively, as well as a lack of capacity to participate in these processes on a regular basis. One resource that could help address both of these potential deficiencies is the law school community in the Basin. Our discussions with law school professors uncovered a strong interest in providing law students with a wide variety of experiences in how to use their legal skills beyond litigation that could help strengthen watershed organizations in the Delaware River Basin.

One overriding theme from the interviews with the law professors was the continued and increased focus on practical course offerings. Another theme was the interest in providing more interdisciplinary opportunities for the law students. Experiential education that includes interdisciplinary opportunities will likely broaden the employment prospects for law graduates while also giving them a more complete understanding of the complexity of many environmental issues. Finally, professors from some of the law schools have previously engaged in discussions about collaborating in order to provide more clinical opportunities for students interested in environmental and natural resources law; they appear interested in revisiting those discussions.

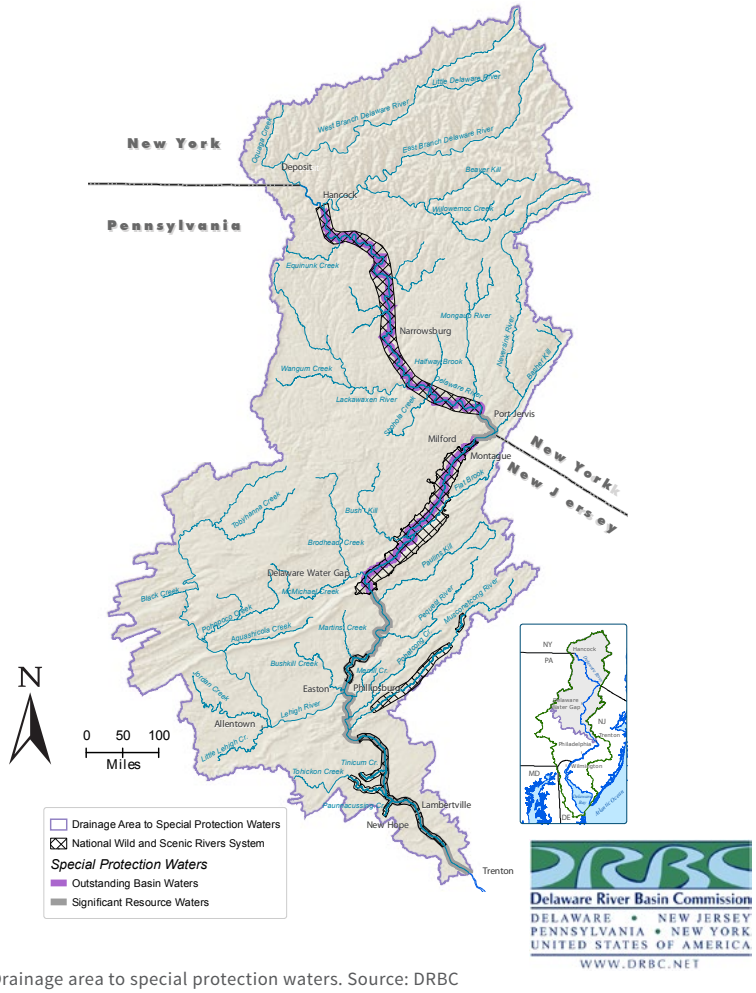
Opportunities: Public Engagement

- Improve access to basinwide data
  Improvement of web-available data at a Basin scale could improve citizen involvement and program implementation.

- Coordinate public review of changes to water quality standards
  Coordinating public review of changes to water quality standards by synchronizing Triennial Review or updates to specific standards and clearly communicating how they will affect activities upstream and downstream on the Delaware River would increase public discussion of basinwide impacts.

- Fund increased DRBC coordinating role as One Process/One Permit Program expands
  The DRBC is designed for Basin focus. If the One Process/One Permit Program can be tested, improved, and replicated in all four states, it is likely to provide the platform needed for greater state and DRBC coordination of standards and assessment as well as permitting, since those program areas must be reflected in NPDES permits and dockets. Public engagement needs to be robust for the One Process/One Permit Program to succeed.

- Develop education/training on public engagement in water programs
  There is a great opportunity for education and training of individuals and organizations regarding civic engagement opportunities as part of Clean Water Act programs across the states and the DRBC programs. We examined the role that the law schools and clinics in the Basin could play.



Drainage area to special protection waters. Source: DRBC

Clean Water Act: Antidegradation Policy

The Antidegradation Policy is part of every state's water quality standards, along with designated uses and water quality criteria.

Three levels or "tiers" of protection:

1. Protect existing uses–any uses on or after 11/28/75
2. Maintain "High Quality Waters"–meet or exceed criteria
3. Protect "Outstanding National Resource Waters"–ecological and recreational significance

40CFR131.12

All four Basin states have a process for designating the most outstanding waters in their state. Delaware is the only state that has not exercised that process. The states vary in their requirements for designation, but general categories include waters with specifically defined high quality, waters of ecological or recreational significance, waters in the federal or state wild and scenic program, and waters in state or national parks. The DRBC, New Jersey and Pennsylvania call out water supply as a reason for designating a high quality, outstanding or Special Protection Water. The states also vary in their levels of protection once waters are designated as high quality, exceptional or outstanding. These protections are technically supposed to be triggered when a new or expanded activity is proposed that has the potential to degrade designated or qualifying waters. Practically, if it happens, antidegradation or SPW is triggered when a permit/docket is sought for a new or increased discharge. In all state and DRBC procedures, there is supposed to be an assessment of necessity of the activity in the proposed location, in the form of an alternatives analysis, as well as an evaluation of the social and economic importance of the activity.

River Network found that the antidegradation process has not been consistently implemented across the states, leaving the Delaware River vulnerable to degradation. Indeed, it does not appear to be implemented in New York at all and in Delaware more than a few times in almost three decades.[28]

In New Jersey, one category of Outstanding National Resources Water (ONRW) waters called nondegradation waters shall not be subject to any manmade wastewater discharges, and the NJ Department of Environmental Protection shall not approve any activity that might cause a lowering of existing surface water quality.[29] In Pennsylvania, all proposed new or expanding discharges into designated Exceptional Value (EV) waters (their ONRW category), as well as High Quality (HQ) waters, must perform the alternatives analysis and choose the non-discharge alternative if one exists, or demonstrate that the discharge will maintain and protect the existing quality of the waterbody. In the HQ waters, but not the EV waters, a socioeconomic test can justify the discharge.[30] This protection should have implications for both NPDES and 404 wetland permitting processes. With DRBC, no measurable change is allowed in the SPW-designated area, with some caveats including allowed mixing zones. New and increased discharges are, however, discouraged by requiring evaluation of nondischarge, load reduction and natural treatment alternatives and demonstration of infeasibility.[31]

There is no indication of any antidegradation coordination across state lines. Between states and DRBC, coordination appears to be focused on proposed permits and dockets. Approval of any DRBC docket (discharge permit) requires at least three out of five Commission member votes (four Basin states and US Army Corps). The approval process therefore does result in sharing of information on mainstem discharges. Coordination of the implementation of the discharge permit programs between the states and DRBC has increased and improved across the Basin as administrative agreements have been developed. While all discharges in the mainstem have to meet the requirements of SPW, DRBC does not get involved in the implementation of state antidegradation procedures.[32] The planned expansion of the One Process/One Permit Program will likely result in greater sharing of data and consultation about preventing degradation between states and DRBC.

Figure 3 elaborates on some elements of the state and DRBC programs.

[28]Phone interview with John Defriesce, Delaware Department of Natural Resources and Environmental Control, February 25, 2016.
[29]N.J.A.C. 7:9B-1.5(d)(2)(i)
[30]25 Pa. Code §93.4c
[31]18CFR410, **http://www.nj.gov/drbc/programs/quality/spw.html#2**
[32]Phone interview, Dave Kovach, Delaware River Basin Commission, January 11, 2017.

Figure 2: Antidegradation and Special Protection Waters Programs

JURISDICTION	NOTABLE FINDING	HIGHEST CATEGORY	PUBLIC NOMINATION	LEVEL OF PROTECTION	EXPLICIT DE MINIMIS	TRIGGER	IMPLEMENTATION
Delaware	Came up 1–2 times in 28 yrs	ONRW (none designated);		May not lower existing quality	5%	New or increased permanent discharge	Tier 2–alternatives analysis & socioeconomic justification (SEJ) discussed; trading allowed
New Jersey	Tier 1–existing quality can be lowered w/alt analysis and SEJ	ONRW which is comprised of Freshwater1 (FW1) and Pinelands (PL)	Yes for Tier 2 (C1, Exceptional ecology, water supply, recreation, fisheries)	No manmade discharges or activities that lower existing quality	No	New or increased discharge	Tier 2 (C1)–alternatives analysis and SEJ;
Pennsylvania	Applies to water withdrawal–must maintain existing uses and/or quality depending on the applicable designation	Exceptional Value	Yes, changing use	No lowering of existing quality	No, 2- part test: pollutant & other factors to determine impact	New or increased discharge	Special modules for EV/HQ; Tier 2 (HQ)–alternatives analysis, non-degrading must be chosen, if none–only then SEJ
New York	No tiers established	ONRW					Upgrading uses, WQBELs, SEQR
DRBC	Doesn't address tributaries; grandfathered existing load not dischargers; NPS included	Outstanding Basin Waters	No	No measurable change to existing quality at BCP/ICP	No	New or increased discharge	Driven by BCP and ICP monitoring; treated as required, then dispersed; SRW–mixing zones allowed

Opportunities: High Quality

- Increase communication and coordination about protection across jurisdictions
  Increase coordination among states and DRBC, especially related to cumulative impacts to high quality and outstanding waters. Coordinate alternatives analyses and socioeconomic tests across states. Use DRBC monitoring to help states define existing uses, higher quality and outstanding waters. Use state antidegradation procedures to better enforce Special Protection Waters.

- Standardize designations
  Standardize higher quality and outstanding/exceptional waters designations within the Basin, if not entirely across the Basin states.

- Develop education and training on SPW and antidegradation
  Inform more groups (and even state agency personnel) in the Basin about these programs and their interaction through basinwide training lead by EPA, DBC or a coalition of NGOs.

3. Protect Drinking Water

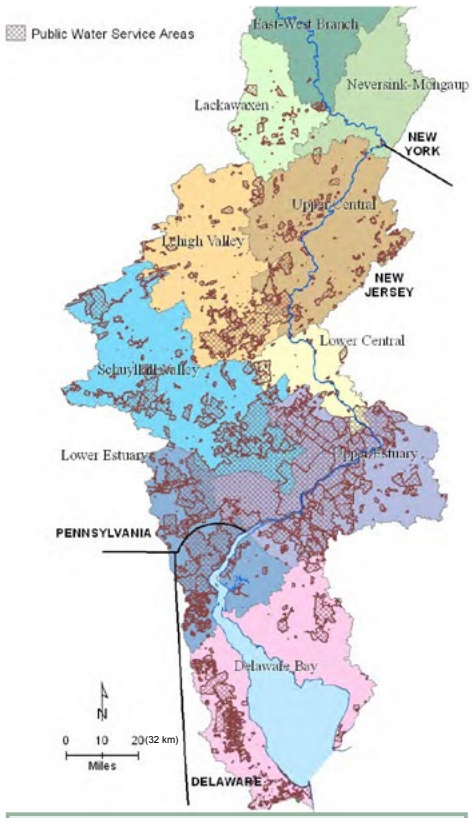


Fig. 2.9. Public Water Supply Service Area Coverage in the Delaware River Basin

River Network examined sourcewater protection across the four Basin states. It appears that New Jersey and Delaware have the best mapping of sourcewater areas and wellhead protection areas.

The following websites provide the state GIS sourcewater information:
DELAWARE http://delawaresourcewater.org/mapping/
PENNSYLVANIA http://www.depgis.state.pa.us/emappa/
NEW JERSEY http://njogis.newjersey.opendata.arcgis.com/datasets?q=source%20water%20protection%20areas
NEW YORK http://gis.ny.gov/gisdata/

DRBC pays attention to drinking water in many ways that are different from the typical "sourcewater protection programs promoted by EPA. DRBC monitors water quality and determines whether it is sufficient to support uses, including public water supplies. DRBC produces a report every two years (305(b) report) that summarizes that information. In addition, DRBC has set stream quality objectives that include Maximum Contaminant Levels (set under the Safe Drinking Water Act to ensure the

Safe Drinking Water Act: Sourcewater Protection

Drinking water standards:
US EPA specifies the maximum permissible level of a contaminant in drinking water which is delivered to any user of a public water system (maximum contaminant level or MCL) for pollutants that threaten public water supplies. These levels are supposed to be updated every five years.
section 1412

Sourcewater Assessments: By 2002, every state had conducted an assessment of its sources of drinking water (rivers, lakes, reservoirs, springs, and ground water wells) to identify significant potential sources of contamination and to determine how susceptible the sources are to these threats. There is no requirement to review and revise these plans regularly, but many states do.
section 1453

[26]Conversation with Bill Musinsky, 5/x/16.

safety of public water supplies) for numerous pollutants. The Commission is also involved in early warning, response, and modeling of spills as well as real-time and rapid response assessments associated with water quality problems such as chlorides and cyanotoxins.[33] As part of its flow management responsibilities, DRBC is charged with preventing saltwater intrusion into the Philadelphia-area drinking water intakes by requiring sufficient flow at Trenton.

Each state and DRBC has developed at least one use category associated with potable water uses. Pennsylvania appears to assign public supply designation to all waters except the Delaware Estuary. New Jersey assigns it to all fresh surface waters, and New York assigns it to several classes of surface and ground water, including saline groundwater. DRBC assigns drinking water use to all zones of the mainstem, not just at the point of intake.

Given the scope of this examination, however, it was not possible to determine whether assigned drinking water uses are adequately considered and protected when an upstream discharge permit or dredge and fill permit is evaluated and granted.

As mentioned in the previous section, New Jersey, Pennsylvania and DRBC all include water supply uses among the reasons for designating outstanding or Special Protection Waters for the highest protections.

River Network examined the Integrated Reports to determine whether water supply uses were described as fully supported in the Delaware River Basin. New Jersey lists three sections of the Delaware River mainstem as not supporting water supply use, but the other three states did not summarize use support by Basin. Instead, stream miles and lake/reservoir acreage that did not fully support water supply uses were summarized by state. Since many parameters can be associated with impairments of water supply use, without the explicit connection to the Delaware River Basin, we were unable to identify whether any mainstem sections or tributaries in the other states had been determined to be unable to support water supply uses. It would take more detailed research into all TMDLs for parameters that can affect drinking water quality to see whether the states explicitly considered water supply in setting the targets for any TMDLs. This analysis did not allow for that level of examination.

[33]Email, John Yagecic, Delaware River Basin Commission, March 16, 2017.

Figure 3: Drinking water protections

JURISDICTION	PUBLIC WATER SUPPLY	APPLIES TO	CRITERIA	NPDES	303D LISTING?	TMDLS?
Delaware	Yes		Standards list acute and chronic concentration limits for freshwater sources. Also criteria for human health, which are broken down into systemic toxicants and human carcinogens.			
Pennsylvania	Yes	To all waters unless listed otherwise in 93.9a-93.9z; deleted from Delaware Estuary	93.6; no toxics in toxic amounts; free froms; bacteria (less protective than for swimming), chloride, color, fluoride, iron, manganese, nitrite, phenolics, sulfate, TDS		2014 statewide #: 71 stream miles; 635 lake acres	2014 statewide #: 12 stream miles
New Jersey	Yes	All fresh surface waters; Pinelands and FW2	Health based numerical criteria based on drinking 2L of water/ day, post-treatment.	Discharging certain biochemical pollutants 500 feet upstream or downstream of intake prohibited.		
New York	Yes	Class A fresh surface waters, Class GA fresh groundwater, Class GSA saline groundwater, AA-Special (AA-S) fresh surface waters, Class A-Special (A-S) fresh surface waters, Class N fresh surface waters, Class AA fresh surface waters.	Health (Water Source) Values; most stringent in sections 702.3 through 702.7			
DRBC	Yes	All zones (1A, 1B, 1C, 1D, 1E, E, W1, W2, N1, N2, C1, C2, C3, C4, C5, C6, C7, and C8) Segments/zones aren't based on drinking water intakes; distinguished by landmarks and river miles.	Water quality criteria are different for each zone. Maximum contaminant levels are applied as human health stream quality objectives.			

Opportunities: Drinking Water

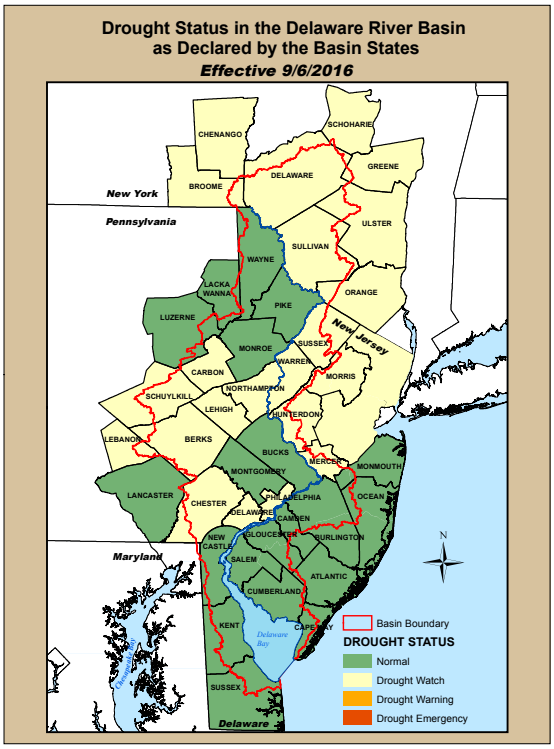
- Map sourcewater areas across Basin
  Educate agency staff and public through consolidated maps about sourcewater protection areas and wellhead protection/recharge areas.

- Track water supply impairments basinwide
  Track impairments of potable water supply uses in the Delaware Basin within each state and across the states.

- Coordinate protection of vulnerable areas
  Coordinate protection of drinking water supplies across the Basin. Focus on the most impactful activities and most vulnerable areas (i.e., greatest number of people dependent on the river or connected groundwater for their water supply).

- Develop education/training on CWA tools to protect drinking water
  Educate/train groups (and agency personnel) on CWA tools that can and should play a stronger role in sourcewater/public water supply protection (e.g., standards, Integrated Report, NPDES program, TMDL).

4. Prevent Thermal Impact



River Network examined the state and DRBC temperature standards and Integrated Reports to compare how desired instream temperatures are defined and monitored for compliance, and how problems are addressed.

River Network found that neighboring states along the same stretch of river have different temperature standards, and that each state defines impairment differently. For all of the Basin states, however, determination of impairment requires more than one exceedance. For instance, repeated samples that do not meet the standard, sometimes up to 10% of the samples, may not trigger the listing of the waterway on the impaired waters list (303d).

Temperature is principally involved in defining whether aquatic life uses are supported. New Jersey requires temperature, dissolved oxygen and biological data to determine whether trout (which are cold water fish) are supported. The state requires only biological data to determine general aquatic life support. Pennsylvania meanwhile links elevated water temperature with viral and bacterial infections in fish populations. As of the writing of this report, DRBC is in the process of adopting new temperature criteria. Currently, in the non-tidal reaches of the river, no DRBC threshold criteria exist that are protective of aquatic life. Instead, the criteria are focused on point sources and thermal mixing zones.[34] In the estuary, DRBC criteria are set as limits specific to each day of the year.[35]

Clean Water Act: Water Quality Standards

States are required to develop water quality standards. Water quality standards have three components:

- Designated uses
- Water quality criteria
- Antidegradation policy and procedures

Temperature water quality criteria must be developed to protect designated uses impacted by temperature. They are usually focused on protecting aquatic life uses.

Every two years, states are required to report to Congress on whether designated uses are supported (305(b)) and water quality criteria are being met (303(d)) list.
40CFR130.7(b)

When particular criteria are not being met, discharge permits are not allowed to "cause or contribute" to those impairments.
40CFR122.4(i)

In addition, states are required to develop restoration plans (TMDLs) to address the problems.
40CFR130.7(c)

[34]Partnership for the Delaware Estuary. 2012. Technical Report for the Delaware Estuary and Basin. PDE Report No. 12-01, 103.
[35]Phone interview with John Yagecic, Delaware River Basin Commission, September 28, 2016.

DRBC summarized temperature monitoring data throughout the Basin from USEPA and USGS in Partnership for the Delaware Estuary's 2012 Technical Report for the Estuary and Basin (2017 update is forthcoming). Upstream water temperatures are influenced by reservoir operations, whereas estuary water temperatures are influenced by tides, meteorological forces, and municipal and industrial thermal loads.[36]

This examination did not include a detailed look at how the states or DRBC address temperature in individual NPDES permits or dockets, however we know that the DRBC criteria in the non-tidal river focus on thermal mixing zones. Therefore, this warrants further examination. In addition, because it appears that there are no TMDLs that explicitly address temperature in the Basin, it was difficult to identify, not to mention compare, the regulatory approaches to temperature impairments across the Basin.

Figure 4: Temperature water quality criteria and impairments

JURISDICTION	TEMP. MAXIMA	TEMP. IMPAIRED WATERS		TEMP. TMDLS– STATE/DRB
		STATEWIDE	DRB	
Delaware	<5 deg above natural; max mean 82; 88 in freshwater	5	0	1/0
New Jersey	88; 82.4 7-day avg in non-trout waters	53	25	1/0
New York	90 in non-trout waters	1	0	0/0
Pennsylvania	87 in non-trout waters Jul/Aug	18	2	1/0
DRBC	Trout: <5 deg increase up to 50; <2 deg increase between 50-58; nothing allowed >58 Non-tidal: ,5 increase; not >87 Zones 2,3,4: <86 or 5 deg > 24 hr avg 1961-66			

Opportunities: Thermal Impacts

- Examine different temperature criteria
  Examine differences and reasoning between the states in terms of a maximum freshwater temperature; could inconsistencies result in stress on aquatic life? Coordinate standard-setting throughout Basin.

- Map temperature impairments
  Map temperature impairments and NPDES permits with thermal discharges to pinpoint potential hotspots and risks to downstream uses. Examine why New Jersey has more waters impaired for temperature.

- Employ existing temperature monitoring in regulatory decisions
  Use and promote the use of the available temperature monitoring information in determining use support, setting criteria, reviewing and revising permits, developing the impaired waters list and developing TMDLs in the Basin.

- Improve basinwide understanding of thermal impacts
  Improve basinwide understanding of thermal impacts and of the available policy approaches. Connect this awareness to those working on climate change resiliency.

[36]PDE. 2012. TREB, 89.

5. Protect Wetlands and Riparian Areas

Because of the varying approaches to wetland and riparian permitting in each state and the involvement of two districts of the US Army Corps of Engineers (Corps) and two regions of the Environmental Protection Agency (EPA), it is difficult to track and compare wetland programs across governmental agencies. This management matrix also makes it difficult to assess cumulative impacts of the various permitting processes on wetlands and other aquatic resources in the Basin.

5.A. Dredge and Fill Permits (a.k.a. Wetland Permits)

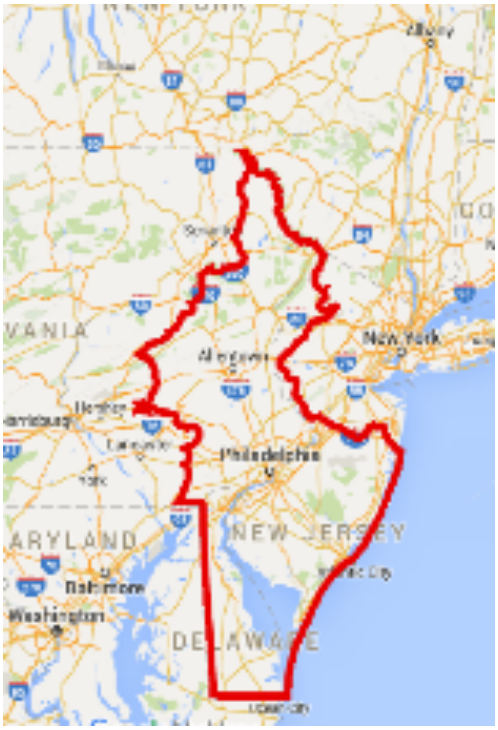
In the Delaware Basin, the Corps and the state of New Jersey have the authority for Clean Water Act section 404 permits and Rivers and Harbors Act section 10 permits. New Jersey is one of only two states in the country that has assumed most of the program from the Corps. The other Basin states have also developed their own programs to protect different sizes and types of wetlands and riparian areas.

State programmatic general permits are in place in Delaware and Pennsylvania. These permits cover many similar activities under one set of requirements with less specificity.

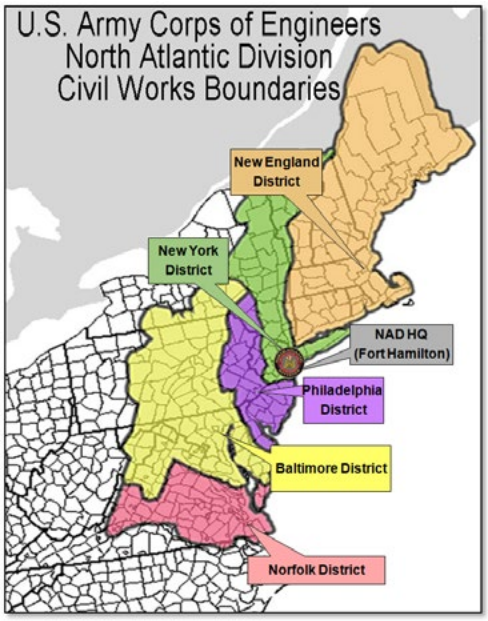
The Corps' Philadelphia district boundaries follow the Basin boundaries in New Jersey, Pennsylvania, and Delaware. The New York district manages two counties in New York state as well as one county and parts of two others in New Jersey that fall within the Delaware River Basin.

The Philadelphia District reports that, in 2015, it issued 50 individual 404 permits for utility projects (including pipelines), maintenance dredging, marinas and docks. These permits are all listed on their website. There was only an occasional request for a public hearing, and there weren't a lot of comments on the projects. The larger projects, including dredging and pipeline projects, attracted the most public interest and comments. In addition, they do get comments on the Nationwide Permits (NWP, general permits designed to cover approximately 50 different categories of similar activities across the country), particularly from groups like the Delaware Riverkeeper.

The New York District retains permit information on its website for two years. In 2012, the most recent information available, there were no individual permits for dredging or discharge of dredge and fill material issued in their part of the Delaware Basin.[37]



US Army Corps Philadelphia District boundaries. Source: http://www.nap.usace.army.mil/Missions/Regulatory/District-Boundaries/



US Army Corps North Atlantic Division boundaries. Source: https://en.wikipedia.org/wiki/North_Atlantic_Division

[37]See USACE New York District website at http://www.nan.usace.army.mil/Missions/Regulatory/Permit-Decisions/.

New Jersey's wetland program is handled through regional offices. In the northern region, where the biggest impacts to wetlands have been from utility gas lines and construction of roads and bridges, NJDEP has received comments on such projects from Delaware Riverkeeper Network (DRN) and Sierra Club. The change in the definition of waters of the U.S. has resulted in more projects in headwaters and isolated wetlands now falling under NJ general permits.[38] In the southwest region, where the impacts are in more industrial and commercial areas, more than 90 percent of the wetland impacts fall under general permits. NJDEP has not received many comments beyond those of DRN, except on large dredging projects.[39] The program requires buffers from 50-300 feet around wetlands. Exceptional resource value wetlands (discharging to trout waters or habitat for endangered species) receive a 150 foot buffer, unless it is also a Category 1 water, which then requires a 300 foot buffer around and upstream within the HUC 14 watershed.[40] Impacts to threatened and endangered species or habitat triggers review by U.S. Fish and Wildlife Service (USFWS) whether the Corps or NJDEP is permitting. NJDEP is now pre-screening those additional reviews due to staff reductions at USFWS.

Delaware's state program requires a permit for activities in tidal wetlands and large freshwater wetlands of 400 acres or more, but it does not cover smaller wetlands. Delaware is the only state without a non-tidal wetland law that protects smaller wetlands (which arguably suffer most from cumulative impacts). Wetlands are delineated by maps that form the basis of all regulatory decisions. Delaware operates under two state programmatic general permits implemented by the Corps, as well as being subject to Nationwide Permits. DNREC staff indicated that development pressure in the state has increased substantially in the last several years, and that most developers design around the need for an individual wetland permit so their activities fall under NWPs. As a result, the state does not have a good sense of the cumulative impacts from most of this activity.[41]

Wetland and waterways permitting in Pennsylvania is managed through a Corps-issued State Programmatic General Permit to reduce permit duplication. The joint permitting process requires only one permit application to the state agency for wetland impacts of 1 acre or 250 feet of stream frontage or less. The applications are then reviewed to determine whether the state, or both the state and Corps, review the project.[42] An activity requiring a federal approval may fall

Clean Water Act: Wetlands and Riparian Areas

Clean Water Act section 404 requires a permit to discharge dredged or fill material into waters of the U.S. The process requires:

- Avoid the impact
- Minimize the impact
- Mitigate the impact

No "unacceptable adverse impact" individually or in combination with impacts of other activities is allowed.
40CFR230

Clean Water Act section 401 allows states to review all federal licenses and permits for compliance with state water quality standards. States can certify, certify with conditions, deny or waive their right. The right to review is automatically waived if not exercised within a year.
40CFR121.2

[38]Phone interview with Lou Cattuna, New Jersey Department of Environmental Protection, May 2016.
[39]Phone interview with Ryan Anderson, New Jersey Department of Environmental Protection, June 2016.
[40]Association of State Wetland Managers, New Jersey State Wetland Program Summary, August 31, 2015.
[41]Phone interview with Tyler Brown, Delaware Department of Natural Resources and Environmental Control, July 7, 2016.
[42]Association of State Wetland Managers, Pennsylvania State Wetland Program Summary, August 31, 2015.

under a State Programmatic General Permit issued by the state, with no additional federal review.[43] Staff noted that they receive public comments on some permit applications.

Pennsylvania issues approximately 700 individual permits each year—about 26 percent of which involve wetlands, but the clear majority, about 74 percent involve stream-related activities.[44]

New York's wetland and aquatic resources are managed through freshwater, tidal, and water resource statutes as well as the state Constitution. Generally, New York has a comprehensive statewide program for all tidal wetlands regardless of size, and freshwater wetlands over 12.4 acres as well as any smaller wetlands determined to be of unusual local importance.[45] Wetlands are mapped, and changes to the maps require landowner notification, review and comment opportunities. The Corps regulates additional wetlands, such as those smaller than 12.4 acres.[46] Wetland permitting is handled through regional offices.

Figure 5: State Wetland Programs & State Review of Nationwide Permits

JURISDICTION	STATE WETLAND PROGRAM	CORPS PERMITS ONLINE	2012 NATIONWIDE PERMITS	401 STATE WATER QUALITY CERTIFICATION
Delaware	Yes, tidal wetlands and large freshwater wetlands (>400 acres)	Phil. District; all individual permits	Certified 401 for most, conditioned some to require individual 401, denied a few	Inadequate staff; only review in sensitive areas; not enough info from Corps
New Jersey	Yes, authority for most CWA responsibilities; Freshwater Wetlands Protection Act (FWPA); defined regional requirements in NJ Pinelands, Hackensack Meadowlands, NJ Highlands 50-300ft buffers	NY District; 2 years available; 2012 most recent Phil. District; All individual permits	Apply additionally where Corps retains jurisdiction; both programs apply in some places	State surrogate in FWPA; and required where Corps has jurisdiction
New York	Yes, comprehensive statewide program for all tidal wetlands and freshwater wetlands >12.4 acres, or of unusual local importance	NY District; 2 years available; 2012 most recent	Certified 401 for 24, conditioned 9, denied 4	"Not that applicable"—standards not "habitat-oriented," wetland program not water quality focused
Pennsylvania	Yes, Dam Safety and Encroachments Act, Clean Streams Law; Corps developed State Programmatic General Permit	Phil. District; All individual permits	SPGP for overlap between Corps and PA jurisdiction; added regional conditions to NWP, denied none	Included in SPGP, Considers sediment as only pollution threat for these activities

[43]See also Association of State Wetland Managers, Pennsylvania State Wetland Program Summary, August 31, 2015.

[44]Environmental Law Institute, State Wetland Protection Status, Trends, & Model Approaches, A 50-state study, Appendix: State Profiles, Pennsylvania, with support from the U.S. Environmental Protection Agency, 2008.

[45]Association of State Wetland Managers, New York State Wetland Program Summary, August 31, 2015.

[46]See NY DEC webpage at http://www.dec.ny.gov/lands/4937.html.

5.B. State Water Quality Certification

Individual permits as well as Nationwide Permits issued by the Corps are subject to state water quality certification under section 401 of the Clean Water Act. From the initial review conducted, it does not appear that the four states in the Basin take full advantage of the section 401 process to protect water quality. Resource constraints are often the primary reason stated for the minimal use of the 401 review. If the state does not perform the review, there isn't anything on which the public can comment. The 401 actions are statewide, rather than by watershed, so we are unable to summarize 401 actions in the Delaware Basin specifically.

New Jersey's dredge and fill permit rules include 401 "surrogate" procedures that are considered to be equivalent to state water quality certification.[47] These rules also provide a process for the review and certification of the small number of Corps permits that are issued when the activities are exempt from state regulation.

Delaware issued 401 certifications for more than half of the 2012 NWP, denied a few and conditioned others to require individual project 401 review where there has been state or federal determination of critical resources that need protection. Similar to all the other states, Delaware has a joint application that combines their state tidal wetlands review and the state water quality certification. In the non-tidal part of the state, the 401 process is the sole way that activities in wetlands less than 400 acres are regulated by the state. Staff in Delaware stated that they do not have the personnel to review all the activities that fall under the Corps' NWP so they only review the activities that impact environmentally sensitive areas. It was also reported that the state does not receive enough information about the impacts of the Corps' section 404 NWP to have a good sense of their cumulative impacts on wetlands.[48] The Environmental Law Institute reported that the Delaware 401 process needed to compile better information on existing impacts, including flood risk, in order to be effective.[49]

Pennsylvania also includes the state 401 certification review of Corps permits within its state wetland permitting, though a separate certification can be submitted. Pennsylvania has applied regional conditions to some of the Corps' NWP but does not appear to have denied certification on any of them.[50]

[47]Environmental Law Institute, State Wetland Protection Status, Trends, & Model Approaches, A 50-state study, Appendix: State Profiles, New Jersey, with support from the U.S. Environmental Protection Agency, 2008.

[48]Id. Association of State Wetland Managers, 401 Certification Program Summary, Delaware, July 2011.

[49]Environmental Law Institute, Delaware Wetland Program Review, August 2010 at 22.

[50]Letter dated June 5, 2012, to William Seib, USACE Baltimore District from Kenneth Murin, PA DEP Chief, Wetlands Division, Encroachments and Training.

New York reportedly conditioned only nine permits and denied eight permits during the 2012 NWP renewal cycle.

None of the states have wetland-specific water quality criteria or designated uses. Therefore, whether projects are going to violate water quality standards has to do with the uses and criteria established for streams and lakes.[51] However, Pennsylvania's antidegradation requirements do allow for the designation of wetlands as Exceptional Value Waters.[52] Wetlands have been so designated. In Pennsylvania, a section 401 certification should involve examination of any potential impacts to designated Exceptional Value wetlands.

Opportunities: Wetlands/Riparian Areas

- Examine impacts of the most-used NWPs in the Basin
  Projects that fall under these permits include, but are not limited to, utility projects (including pipelines), road and bridge building, maintenance dredging, residential and commercial development, marinas and docks. By examining the cumulative impacts of the most common NWPs, greater public and agency attention can be focused on them. In the coming year, regional and state conditions could be placed on them as they will be renewed in March 2017.

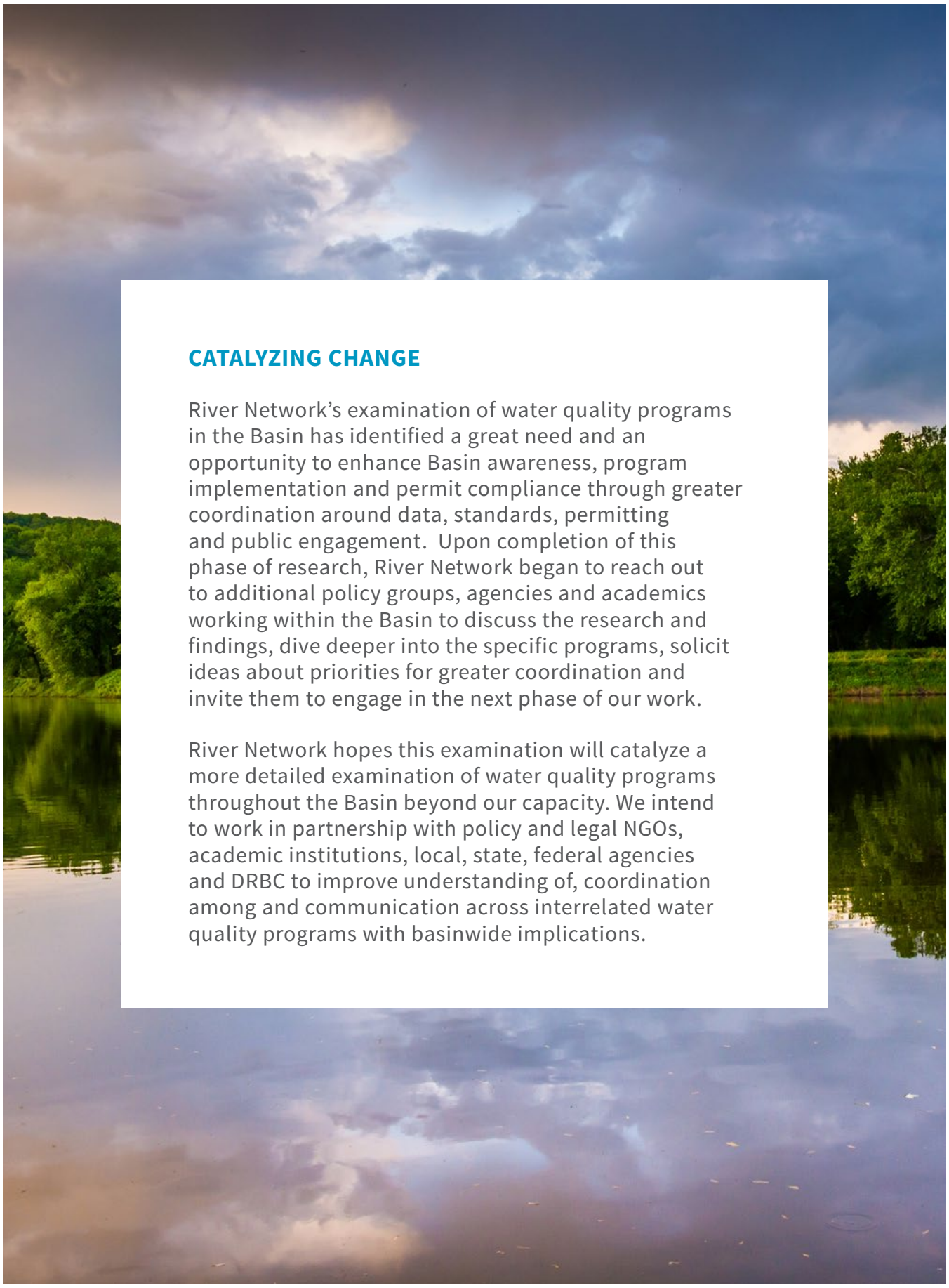
- Promote wetland-specific water quality standards
  Summarize areas around the country that have developed wetland water quality standards. Pennsylvania has applied its antidegradation program to wetlands and that could be a starting point for the basinwide discussions.

- Examine patterns of 401 waivers
  Assess consequences of the state waivers of 401 water quality certification of general and individual wetland permits. Further examination can document which states are waiving which NWPs and why. In addition, a closer look at the effectiveness of the NJ equivalent within their permit process would be warranted.

- Develop education/training on 404/401 review
  Educate/train groups (and agency personnel) on the complicated web of regulation associated with wetland and riparian impacts across the Basin, as well as each state's oversight authority (401) on federal permits. Promote more coordinated public input around cumulative impacts throughout the Basin.

[51]Environmental Law Institute, Delaware Wetland Program Review, August 2010; available at http://www.dnrec.delaware.gov/Admin/DelawareWetlands/Documents/ELI%20Delaware%20Wetland%20Review.pdf.

[52]PA Water Quality Standards, Chapter 93.



CATALYZING CHANGE

River Network's examination of water quality programs in the Basin has identified a great need and an opportunity to enhance Basin awareness, program implementation and permit compliance through greater coordination around data, standards, permitting and public engagement. Upon completion of this phase of research, River Network began to reach out to additional policy groups, agencies and academics working within the Basin to discuss the research and findings, dive deeper into the specific programs, solicit ideas about priorities for greater coordination and invite them to engage in the next phase of our work.

River Network hopes this examination will catalyze a more detailed examination of water quality programs throughout the Basin beyond our capacity. We intend to work in partnership with policy and legal NGOs, academic institutions, local, state, federal agencies and DRBC to improve understanding of, coordination among and communication across interrelated water quality programs with basinwide implications.

APPENDIX A

Acronyms and Abbreviations

Corps — U.S. Army Corps of Engineers CWA - Clean Water Act

CWA — Clean Water Act

DENREC — Delaware Department of Natural Resources and Environmental Control

DRB — Delaware River Basin

DRBC — Delaware River Basin Commission

EPA — Environmental Protection Agency

303d list — List of Impaired Waters

MGD — Million Gallons per Day

NJDEP — New Jersey Department of Environmental Protection

NPDES — National Pollutant Discharge Elimination System

NWP — Nationwide Permit

NYSDEC — New York State Department of Environmental Conservation

ONRW — Outstanding Natural Resource Waters

PADEP — Pennsylvania Department of Environmental Protection

SPGP — State Programmatic General Permit

SDWA — Safe Drinking Water Act

SEJ — Socioeconomic Justification

SPW — Special Protection Waters

TMDL — Total Maximum Daily Load

APPENDIX B

Roles of the Primary Authorities

1. States and tribes

Each state in the Basin must develop water quality standards that include designated uses, water quality criteria and antidegradation policies and procedures. In addition, since U.S. Environmental Protection Agency (EPA) has "delegated" the pollutant discharge program authority to each of the Basin states, all four of them must also develop and implement discharge permit programs and coordinate with DRBC (check specific requirements for coordination). States must assess and report their impaired waters and develop Total Maximum Daily Loads (restoration plans) for every pollutant/stream segment combination.

Add discussion about tribes in the Delaware Basin…
none have TAS or water quality standards.

New Jersey is one of two states in the nation that has "assumed" the role of permitting for dredge and fill into "waters of the United States." These permits are commonly known as wetland permits, but in reality, they are more broadly applied to impacts along waterbodies and activities that cross waterbodies as well. The other three Basin states generally work with the U.S. Army Corps of Engineers (Corps) in their implementation of this program. New York and Pennsylvania have their own dredge and fill permitting programs as well. These state versions generally address impacts smaller than what triggers the Corps permits. Delaware does not have its own program.

New York, Pennsylvania and Delaware are afforded the "privilege" of reviewing and certifying whether the Corps permits will meet each state's water quality standards. This privilege is often waived.

2. Delaware River Basin Commission

The Delaware River Basin Commission has a myriad of responsibilities that are outside the scope of this analysis. For our purposes, we focused on the Commission's development of water quality standards, development and implementation of its project review and permitting/docketing program and coordination with the states on NPDES permitting and development and implementation of the special protection waters program.

As stated on the DRBC website:

The Delaware River Basin Compact (Compact) requires the commission to formulate and adopt a Comprehensive Plan for the immediate and long-range development and uses of the water resources of the Basin and a multi-year water resources program consistent with the Comprehensive Plan (Compact, §3.2).[53]

DRBC has recently authorized a voluntary "One Process/ One Permit Program" for projects subject to regulatory review by both the DRBC and a Basin state. With regard to wastewater discharges, only the states of New Jersey and New York are currently piloting this program.

DRBC has developed a Special Protection Waters program that covers the entire non-tidal Delaware River to prevent degradation in the Basin where existing water quality is better than the established water quality standards. The program takes a watershed and cumulative impacts approach and does not allow new or expanded pollutant loadings that will result in any "measurable change in existing water quality… except toward natural conditions."[54]

3. U.S. Environmental Protection Agency (EPA)

The EPA is charged with reviewing and approving all state water quality standards, developing discharge permit programs (which have been delegated to the four Basin states), and working with the U.S. Army Corps of Engineers and the states to review and approve or deny dredge and fill permits.

The EPA is also tasked with interstate oversight. No upstream state is allowed to issue permits that will violate downstream states' water quality standards.[55]

4. U.S. Army Corps of Engineers (Corps)

The Corps is the lead agency for the dredge and fill permitting program, and therefore must work with states and EPA to develop and implement the program in New York, Pennsylvania and Delaware. New Jersey has assumed responsibility for the program, and therefore, the Corps plays a lesser supporting role there.

[53]DRBC Project Review/Permitting website, **http://www.nj.gov/drbc/programs/project/**
[54]DRBC SPW Program website, **http://www.nj.gov/drbc/programs/quality/spw.html**.
[55]Okahoma v. EPA. 908 F.2nd595, 606 (10th Cir.1990). **http://via.library.depaul.edu/cgi/viewcontent.cgi?article=2024&context=law-review**.
Photos unless otherwise noted from Shutterstock.com