



Ohio River Valley Water Sanitation Commission

A Watershed Year

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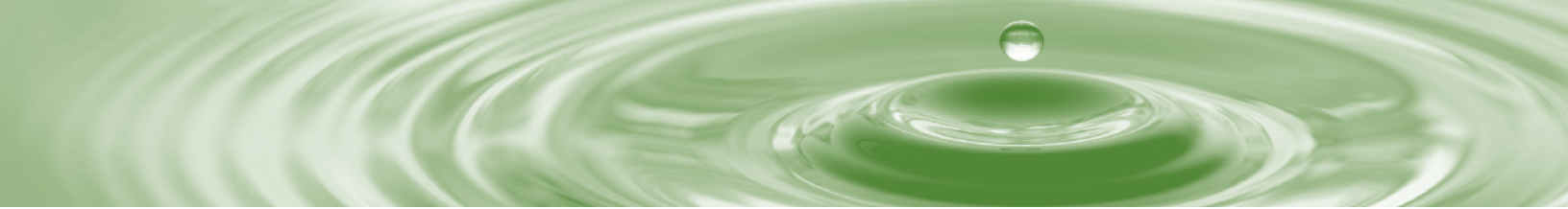


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To the President and Governors

The Ohio River Valley Water Sanitation Commission (ORSANCO) is an interstate water pollution control agency created in 1948 by the State of Illinois, the State of Indiana, the Commonwealth of Kentucky, the State of New York, the State of Ohio, the Commonwealth of Pennsylvania, the Commonwealth of Virginia, and the State of West Virginia with approval of the Congress of the United States. The Commissioners of ORSANCO respectfully submit the following report of activities for 2009 to:

The Honorable Pat Quinn, Governor of Illinois

The Honorable Mitchell E. Daniels, Jr., Governor of Indiana

The Honorable Steven L. Beshear, Governor of Kentucky

The Honorable David A. Paterson, Governor of New York

The Honorable Ted Strickland, Governor of Ohio

The Honorable Edward G. Rendell, Governor of Pennsylvania

The Honorable Tim Kaine, Governor of Virginia

The Honorable Joe Manchin III, Governor of West Virginia

and

The Honorable Barack Obama, President of the United States



Chairman's Message

The Ohio River Basin encompasses not only fourteen states and myriad political districts, but a diverse range of economic, cultural, and ecological regions as well. Yet even with these differences, the region shares a distinct identity. Like the Great Lakes, Chesapeake Bay, and other well-known regions, the Ohio River Basin is a vital national resource deserving of wise stewardship.

In 2008, ORSANCO looked back at the past 60 years and paid homage to the progress made in improving the quality of the Basin's streams. In 2009, we looked to the future with a critical eye to ORSANCO's role going forward. Since 1948, ORSANCO has worked to foster cohesion in the realm of water quality improvement. In the early years, pollution abatement focused on basic wastewater treatment. Since those accomplishments, pollution control efforts have broadened to a basin-wide approach. This broader focus necessitates that the Commission embrace a new approach and a new vision. In many ways, 2009 was truly a "watershed year."

Given the current economic climate, interstate cooperation and collaboration are more imperative than ever to the future of water quality in the Ohio River Basin. Innovative solutions to water quality issues can be achieved only through combining financial resources and forging partnerships with states, industries, and organizations within the Basin and the nation.

Political support at both the national and regional level is critical to the success of the Commission's work. In return, ORSANCO continues to develop its programs in a way that compliments, not duplicates, the efforts of state water quality agencies, and brings to the table all the entities necessary to achieve real progress for the region.

Throughout this challenging year, ORSANCO has been committed to working "smarter," dedicated to advancing and expanding its mission rather than retrenching, while responding to the needs of its member states in a fiscally responsible manner. Moving forward, we remain uniquely positioned to respond to the diverse challenges of the Ohio River Basin.

Moving forward, we remain uniquely positioned to respond to the diverse challenges of the Ohio River Basin.



Jeffery A. Eger, Chairman



Outgoing Chairman David Flannery and current Chairman Jeffery Eger



2009: A Watershed Year

When the Ohio River Valley Water Sanitation Compact was enacted in 1948, less than one percent of sewage discharged to the Ohio River received any treatment. The Commission's original focus, therefore, was to assure that municipal wastewater discharged to the River receive necessary treatment, and that industrial discharges also receive necessary treatment. With those goals accomplished, the Commission has broadened its focus in recent years to encompass sources of pollution throughout the Ohio River Basin. ORSANCO and its member states recognize that the nature of interstate pollution control is now watershed-based, and issues with the Ohio River, and even as far away as the Gulf of Mexico, cannot be resolved without first addressing issues with the Basin's tributaries.

The dictionary defines "watershed" as:

- *The entire geographical area drained by a river and its tributaries; an area characterized by all runoff being conveyed to the same outlet.*
- *An event marking a unique or important historical change of course or one on which important developments depend; turning point; defining moment.*

2009 was, both literally and figuratively, a watershed year for ORSANCO, as the organization reviewed its mission and role in the context of basin-wide management and economic uncertainties. Now more than ever, ORSANCO provides value to its member states in coordinating and streamlining pollution control efforts throughout the Watershed.

Scenario Planning Workshop

In February, the Commission addressed the future direction of ORSANCO during a scenario planning workshop. Important issues identified in this workshop included the need for greater communication, targeted outreach, collaboration and cooperation with stakeholders, and the resolve to be open and available to provide enhanced services to its member states.

June Commission Meeting in Tennessee

The June Commission Meeting was held outside the Compact district, in Nashville, Tennessee. Involved in the original negotiations that established the Compact, Tennessee is integral to managing water quality in both the Ohio and Mississippi River Basins. The meeting included a discussion of interstate water quality management with the Lower Mississippi River Conservation Committee and the Tennessee Department of Environment and Conservation. These organizations recognize that the stewardship of these river basins requires a high level of collaboration, as the immensity of the land area and the science issues far outweigh the expertise of any one organization.

Ohio River Basin Congressional Caucus

One significant result of ORSANCO's outreach efforts was the formation of a bipartisan Ohio River Basin Congressional Caucus. Announced in October, the caucus will address critical issues within the Ohio River Basin. The primary goal of this caucus is to ensure political and financial support for programs and projects within the Watershed.

Ohio Basin Summit

In October, the U.S. Army Corps of Engineers, along with ORSANCO, U.S. EPA, and the Ohio River Basin Water Resource Association, convened over 30 state and federal government, non-profit, and private stakeholders for an Ohio Basin Summit. This landmark summit addressed such themes as water use and management, water quality, ecosystem protection and restoration, aging infrastructure, sustainable watershed development, and elevating the profile of the Ohio River Basin.

Environmental Outreach

In addition to working successfully with state and federal agencies and public and private stakeholders in the Basin, the Commission is fostering a revitalized relationship with environmental organizations. In July, ORSANCO partnered with Kentucky Watershed Watch, a citizen monitoring group, to coordinate statewide water testing to assess the amount of pathogen and nutrient pollution loading Kentucky waterways contribute to the Ohio River. The Commission also received a number of supportive comments from the environmental community regarding the proposed revisions to its Pollution Control Standards.

Program Accomplishments

The year saw major developments within ORSANCO's program areas as well. The Organics Detection System (ODS), which operates daily to detect organic compounds that could compromise drinking water intakes, received \$1.2 million in federal funding to carry out a major upgrade. Moreover, ORSANCO completed Ohio River pool surveys, marking the end of the first five-year rotation of biological assessments. Also, Commissioners approved proposed revisions to the Pollution Control Standards, and several research projects were initiated.





Preparing for the Future...

In order to better understand the future challenges facing the Ohio River Basin, Commissioners and staff participated in a scenario planning workshop in February. This workshop allowed ORSANCO to develop an understanding of where the organization is positioned, and where it desires to go.

The central policy question used for ORSANCO's scenario planning workshop focused on the organization's mission: "Is the current Compact scope of ORSANCO services responsive to the states' needs and reflective of the key future challenges facing the organization?"

As a result of scenario planning, a series of common, or frequent, strategies was identified. Such common strategies will be useful under a wide range of possible futures and are therefore more likely to be valuable as the future unfolds.

The following common strategies emerged, which are vital to meeting the future needs of Ohio River stakeholders:

- **Communication** – The need for communication was clear in all future scenarios and has two general purposes: recognition and collaboration. ORSANCO's single most valuable service may be coordinating communication among states.
- **Revenue Enhancement** – Diversifying revenue streams will guard against budgetary shortfalls and interruptions to Commission programs that require continuity.
- **Data Sharing and Management** – Ultimately, ORSANCO is an organization that depends heavily on creating useful information for its stakeholders. Finding cost-effective ways to develop information will enhance both the Commission's value and its ability to maintain steady revenue.
- **Cooperation & Collaboration** – In addition to data sharing, there are many opportunities for ORSANCO to team with member and non-member states, non-government organizations, universities, the agriculture community, and other stakeholders. Such collaboration not only creates efficiencies but furthers efforts to improve communication.
- **Right-Sizing Technology** – Appropriate leveraging of technology is as important during good times as during challenging times. A formalized process for evaluating the costs and benefits of technologies will help the Commission decide in which new technologies to invest.

"What is Scenario Planning?"

Considering future scenarios helps managers develop more robust strategies that are flexible enough to adapt to unanticipated future events. Strategies that work in multiple future scenarios will better position an organization for success in whatever the future holds. Ultimately, scenario planning is a group process that encourages knowledge exchange and the development of a mutual deeper understanding of central issues important to the future.

ORSANCO has undertaken activities to begin addressing these common strategies.

In response to the central question defined above, the Commission also recognized that water *quality* and water *quantity* are inseparable in achieving its mission. ORSANCO is exploring collaborative opportunities to better serve its stakeholders in the area of total water quality management, including water withdrawal and water quality trading, in addition to its traditional water quality-focused mission.



Enhancing Support for the Basin

To achieve the goals set during its scenario planning, the Commission is seeking an enhanced level of gubernatorial support and congressional recognition of the Ohio River Basin. Increasing visibility and developing a collective voice are key to securing support for the Basin. ORSANCO has been holding meetings with the governors' offices of the Compact states to move this process forward.

A significant step toward facilitating congressional cooperation occurred during the October Commission meeting, held in Washington, D.C. United States Congresswoman Shelley Moore Capito (R-WV) and United States Congressman Steve Driehaus (D-OH) announced the formation of the bipartisan Ohio River Basin Caucus. The caucus is dedicated to addressing critical economic, infrastructure, agricultural, environmental, and community issues within the Basin. These issues affect a significant portion of the nation, covering over 200,000 square miles and including 55 Congressional districts in 14 states. The major goal of the caucus is to ensure support from Congress and the Administration for programs and projects essential to the Watershed.

Representatives Capito and Driehaus will serve as caucus co-chairs. They acknowledged that the Ohio River Valley has long been a critical economic pipeline that connects manufacturers, farmers, and other businesses to markets across the nation and around the world. This important caucus will help promote and protect the region's interests for years to come.

In recognition of their leadership in establishing the Ohio River Basin Caucus, ORSANCO honored Representatives Capito and Driehaus as "Ohio River Champions."

Excerpt of letter sent from WV Governor Joe Manchin to the governors of the other Compact states:

"I am writing to you to request that you join me in my continued support for the Ohio River Valley Water Sanitation Commission, and in urging the establishment of an Ohio River Basin Congressional Caucus to serve as our voice in Washington to help assure that the Ohio River Basin will receive the type of recognition we provided to other great water resources in this region, such as the Great Lakes and the Chesapeake Bay."

*Excerpt of Wheeling Intelligencer/
News-Register Editorial*

POSTED: October 29, 2009

"[T]he caucus...should be particularly effective in addressing special concerns such as those involving water quality and industry. At a time when ultra-partisanship seems to be a way of life in Congress, Capito and Driehaus are attempting to build a coalition in which party affiliation is secondary to serving constituents. We applaud the idea and encourage all members of Congress from Ohio River Basin states to participate in the caucus."



Commissioner Ron Potesta (WV), U.S. Congresswoman Shelley Moore Capito (R-WV), and Commissioner David Flannery (WV)



Federal Commissioner Stuart Bruny, U.S. Congressman Steve Driehaus (D-OH), and Commissioner Paul Tomes (OH)



Water Quality Programs

ORSANCO's water quality monitoring and assessment programs provide the data necessary for state and federal agencies and the Commission itself to continuously strive for water quality improvements. Many programs carried out by the Commission are greatly enhanced through working partnerships with others. In 2009, the Commission:

- worked with the U.S. Geological Survey to complete a bacteria source tracking study to evaluate methods for identifying human-caused bacteria pollution in large rivers;

- partnered with the Kentucky Watershed Watch to coordinate statewide water testing;

- worked with U.S. EPA's Cincinnati Research Lab on analytical techniques for pathogen analysis;

- collaborated with the Electric Power Research Institute to develop a nutrient trading program for the Ohio River Basin.

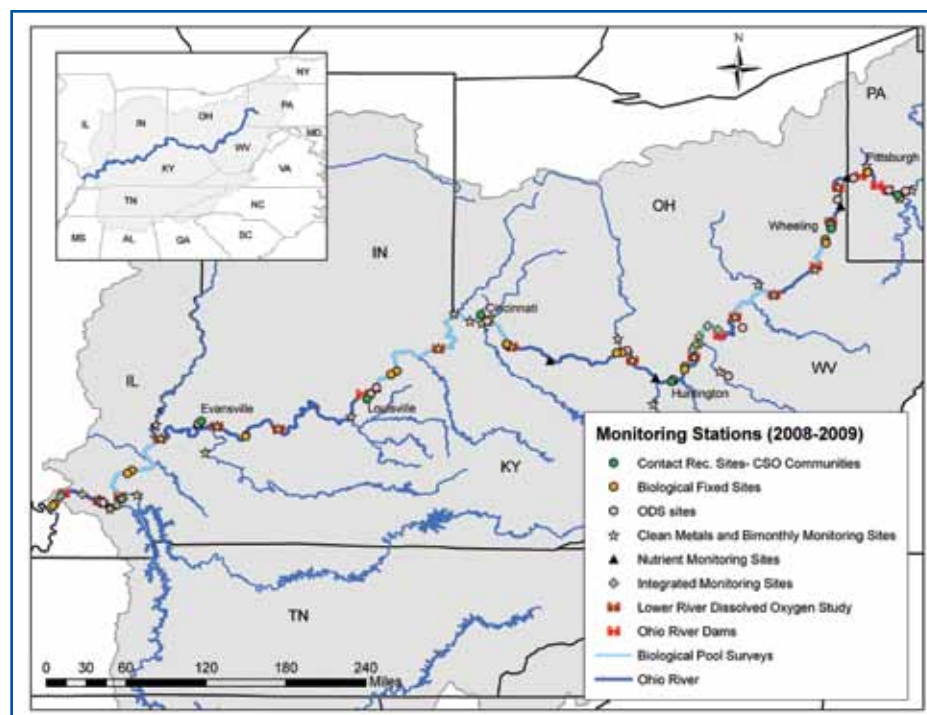
ORSANCO conducts water quality monitoring programs that allow it to assess the Ohio River for such uses as public water supply, contact recreation and aquatic life habitat. Routine monitoring programs include bimonthly sampling, clean metals, bacteria, dissolved oxygen and temperature, algae and nutrients. In addition, the Commission carries out targeted monitoring for specific investigations.

Bimonthly Sampling

ORSANCO's Bimonthly Sampling Program evaluates water quality status and long-term trends for the Ohio River. Initiated in 1975, this monitoring program has a continuous record through the present day for 31 locations: 17 stations on the main stem of the Ohio River and 14 points near the mouth of major tributaries. Samples are collected bimonthly from locks and dams, bridges, and bank locations. Water quality parameters include: ammonia, hardness, sulfate, total organic carbon, nitrate/nitrite, total kjeldahl nitrogen, chloride, phenolics, total suspended solids, cyanide, and total phosphorus. In 2009, there was one criteria violation for sulfate on the Big Sandy River.

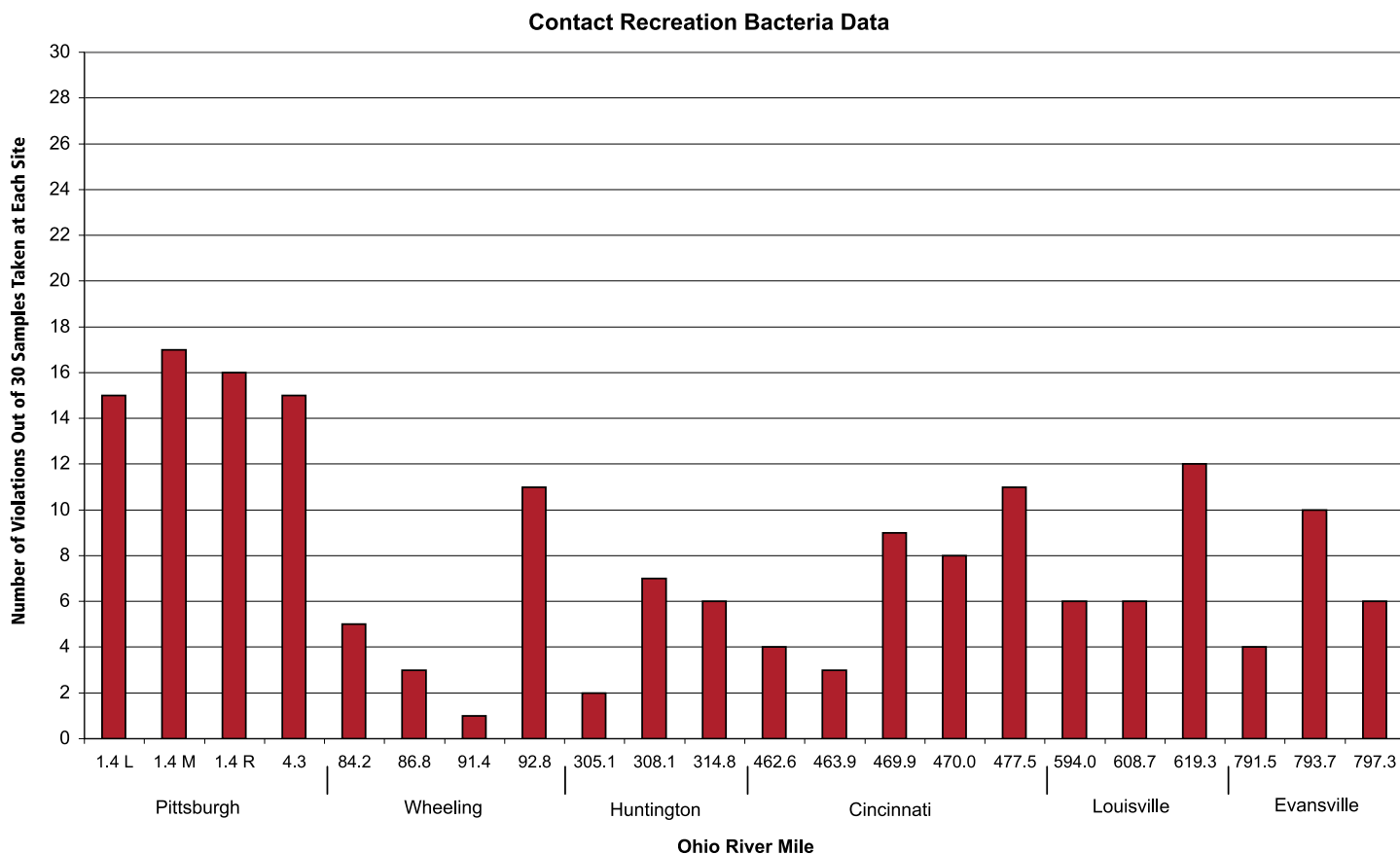
Clean Metals Sampling

ORSANCO initiated clean metals monitoring in 1998 to allow metals analysis at very low levels. Samples are collected bimonthly from the 17 Ohio River stations and analyzed for 18 different metals, both in dissolved and total forms. The state-of-the-art "clean" technique minimizes the possibility of contamination. These data are used to assess compliance with water quality criteria, and to evaluate the River's ability to support fish and macroinvertebrates. In 2009 there were criteria violations for mercury at Smithland, J.T. Myers, Newburgh, L&D 52, and West Point.



Contact Recreation Bacteria Monitoring

During the contact recreation season (May-October), ORSANCO monitors bacteria levels in six urban areas along the Ohio River. Samples are analyzed for both fecal coliform and *Escherichia coli* (*E. coli*) bacteria. Such bacteria may indicate the presence of pathogens that can cause illness in humans. Bacteria in these urban areas come primarily from combined sewer overflows (CSOs) and other wet weather sources of storm water.

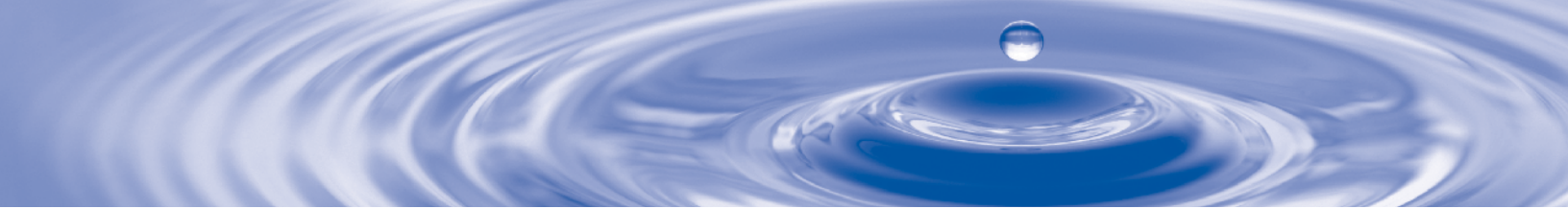


Nutrients and Algae

Nutrients like nitrogen and phosphorus enter the Ohio River from many sources, such as agricultural and urban runoff, as well as from discharges of sewage and industrial waste. ORSANCO collects water samples from seven locations twice per month, which are analyzed for nutrients, algae, and chlorophyll a. This information is used to develop nutrient criteria and track trends.

Excess nutrients can cause algae-related taste and odor problems for drinking water utilities, and also contribute to low dissolved oxygen levels, which can have a negative impact on the biological community. In May and June of 2009, an algal bloom (diatoms) in the upper river caused taste and odor problems for several drinking water utilities. There was also an algal bloom (*Microcystis*) near Cincinnati in September.

ORSANCO is collaborating with the Electric Power Research Institute (EPRI) to develop a nutrient trading program for the Ohio River Basin. This program will produce water quality credits for nitrogen and phosphorus aimed at protecting watersheds at lower overall costs. The program may also benefit receiving water bodies as far away as the Gulf of Mexico. This will be a first-of-its-kind interstate trading project in terms of scope and magnitude, and represents a comprehensive approach to designing and developing credit markets for nitrogen and phosphorus.



Gulf of Mexico Hypoxia

ORSANCO continued its efforts to address the role of the Ohio River Basin in the Gulf of Mexico hypoxia zone. Nutrients from the Mississippi River Watershed (including the Ohio River) flowing into the Gulf contribute to the growth of algae. When these algae decay, they deplete the water of oxygen to levels that cannot fully support marine life. ORSANCO coordinates the Ohio River Sub Basin Committee of the Gulf Hypoxia Task Force. This Sub Basin Committee provides a mechanism for collaboration among agricultural, conservation, and environmental agencies in nutrient abatement efforts.

Long-Term Trends

In 2009, ORSANCO monitoring continued into its 34th year, placing it in a unique position to answer questions of long-term water quality trends. ORSANCO first undertook a study of long-term trends in 1990, with 10 to 15 years of record at most monitoring stations. The period from 1990 to 2007 encompassed another 18-year record. Results from this analysis are shown below, clearly illustrating that most metals are on the decrease while nutrients and non-metal pollutants are rising. Important trends include increasing phosphorus and chloride concentrations throughout the river.

TARGETED INVESTIGATIONS

Integrated Assessment Sampling

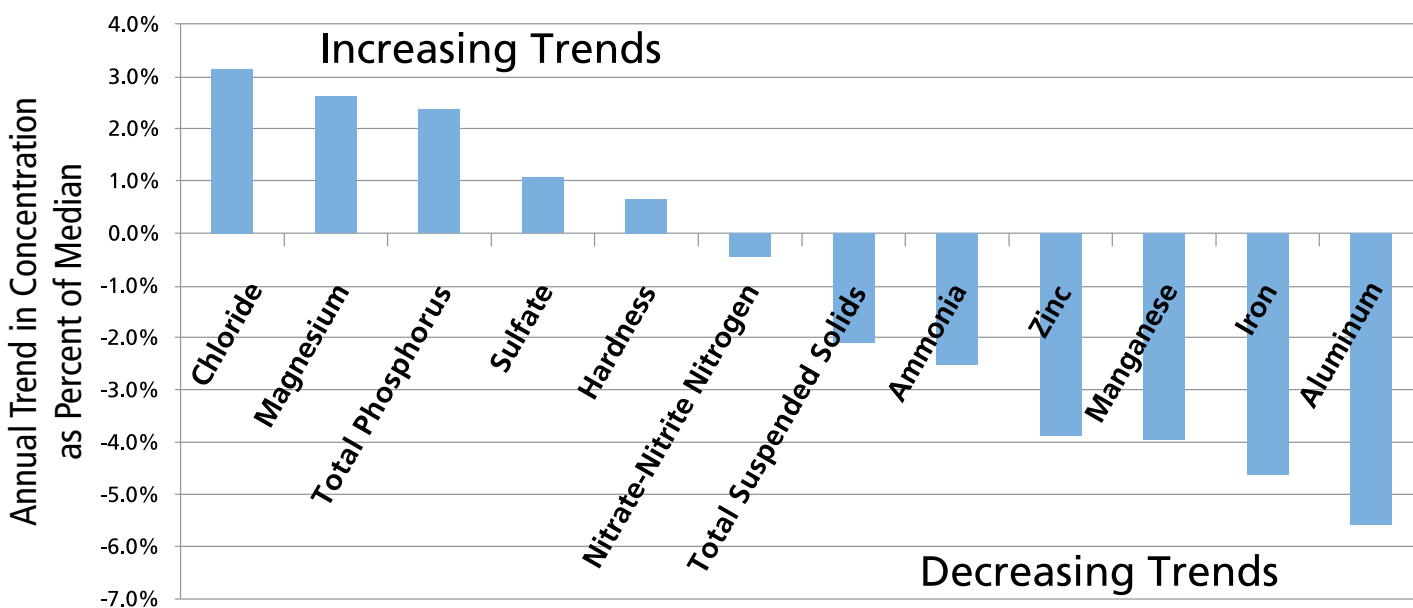
For the past four years, ORSANCO has carried out integrated assessment studies to better understand the relationship between its water chemistry data and biological monitoring results. The studies are also designed to determine whether ORSANCO's monitoring stations, which are located at either end of Ohio River pools, adequately describe the water quality conditions of the entire pool. In 2009, three surveys were conducted from Smithland Lock and Dam to the Mississippi River. Survey results indicate that, in the absence of major tributary contributions, there are not large variations in conditions within pools.

Beaver River PCB Source Investigations

Monitoring efforts have found polychlorinated biphenyl (PCB) levels in the Ohio River and its tributaries well above the ambient water quality criteria. Due to the immense size of the Ohio River Basin, however, identifying specific sources of this legacy pollutant has proven to be very difficult. The Commission has taken a targeted approach by focusing a source investigation study on a sub-basin scale. The Beaver River Basin was selected for this targeted monitoring effort based on its more manageable size and due to the elevated PCB concentrations observed in previous sampling efforts.

Ohio River Water Quality Trends: 1990-2007

Basinwide Trend Direction and Magnitude by Parameter



The initial round of sampling, conducted in December 2009, focused on identifying the main PCBs source areas within the Watershed. Subsequent monitoring will be completed in 2010 to zero in on specific significant sources of PCBs to the Beaver River. This interstate effort involves Ohio and Pennsylvania.

ASSESSMENT PROGRAMS

Ohio River Watershed Pollutant Reduction Program

ORSANCO initiated the Ohio River Watershed Pollutant Reduction Program in 1995 to characterize the extent and severity of certain pollutants of concern in the Ohio River, and develop integrated, interstate strategies for their abatement. The program was designed to be pollutant-specific; the current set of pollutants for attention includes bacteria, dioxin, PCBs, chlordane, atrazine, phosphorus, and nitrogen. These pollutants have been identified as causing significant impairment to the beneficial uses of the Ohio River. The Commission coordinates efforts by the states to develop Total Maximum Daily Loads (TMDLs) for these pollutants, and carries out monitoring and assessment activities to support the development of those TMDLs.

The Ohio River Watershed Pollutant Reduction Program has made great strides in advancing the understanding of the presence of contaminants causing use impairments in the Ohio River and its tributaries. Innovative techniques to detect and analyze these contaminants have also been developed through the program's initiatives. As a benefit to its member states, the Commission has completed TMDLs required under Federal regulation and consent orders. Without the Commission's efforts, the burden of developing these TMDLs would have fallen on the states.

Bacteria TMDLs

Fecal coliform and *E. coli* bacteria are indicators of the presence of human sewage and other warm-blooded animal feces in the water. In 2009, the Commission continued to play an active role in developing bacteria TMDLs for the Ohio River. This effort is being led by U.S. EPA Region 5 with guidance from ORSANCO's TMDL Work Group. In January, public "kickoff" meetings were held in each of the six states bordering the River. These meetings served to inform stakeholders of the TMDL effort underway and to solicit comments on the proposed approach. Over the past year, ORSANCO conducted five rounds of bacteria sampling of 130 tributaries to the Ohio River. The data generated from this survey will help characterize tributary loadings and will aid in the TMDL modeling effort.

Recreational Use Survey

In 2009, the Commission received results of a recreational use survey of the Ohio River. The purpose of this survey was to identify the level of recreation people enjoy on the River, where they engage in river recreation, and what times of year they use the River. Survey results will be used to help determine whether ORSANCO's current bacteria standards adequately protect people who use the River for contact recreation.

POLLUTION CONTROL STANDARDS

ORSANCO sets Pollution Control Standards for industrial and municipal wastewater discharges to the Ohio River. These Standards designate specific uses for the river (public water supply, recreation, aquatic life, and fish consumption), and establish in-stream criteria and treatment requirements to ensure support of these uses. To keep pace with current developments, the Commission reviews the Pollution Control Standards every three years. As part of the review and revision process for 2009, the Commission held informational meetings in several cities and a public hearing in the Cincinnati area to allow public comments on proposed revisions.

Significant revisions for this review cycle include: adoption of an ammonia criterion to protect public water supply; adoption of site-specific Ohio River translators for metals, which allows permit writers to issue appropriate discharge permits based on site-specific conditions; and adoption of updated numeric criteria for a number of parameters to reflect best science.

What is a TMDL?

A total maximum daily load (TMDL) is the maximum amount of a pollutant that can be present in a body of water without causing impairment or exceedence of state water quality standards. TMDLs can be thought of as clean-up plans for polluted streams and rivers and are tools that help regulators abate water pollution.



Biological Programs

The Commission's biological monitoring programs allow scientists to measure and interpret the overall health of the Ohio River's aquatic community. ORSANCO employs a two-pronged approach by using fixed monitoring locations and pool-specific probability surveys. The Commission also analyzes the tissue of certain fish species for the presence of selected contaminants. ORSANCO's biological programs oversaw the completion of several major projects in 2009.

Pool Assessments

In 2004, ORSANCO developed a long-term monitoring and assessment strategy that divides the Ohio River into 19 different biological assessment units, with 15 random sites sampled in each. A pool (that section of the River between two locks and dams) serves as an assessment unit. Typically, four pools are assessed each year with the goal of achieving a complete river-wide survey every five years. In 2009, the Belleville, Markland, McAlpine, and Open Water pools were assessed (Figure A). This marked the successful completion of ORSANCO's first five-year rotation, covering the entirety of the Ohio River.

MORFIN

ORSANCO is in the forefront of efforts to develop methodologies for monitoring and assessing the aquatic communities of large rivers like the Ohio. In 2008, the Commission modified its Ohio River Fish Index (ORFI), maintaining the original design and metrics, while adopting more detailed habitat classes, continuous scoring, and a new approach to interpreting results. The MORFIN is a tool used to provide numerical scores that relate to the health of fish populations, and can be used to identify the extent to which the river meets aquatic life use designations.

The results of this river-wide survey can be seen in Figure B. Over the five-year period of the survey, only two pools, Dashields and Montgomery, were found to be in "poor" biological condition and failed to meet the aquatic life use designation. Of the pools sampled in 2009, Markland and McAlpine were both found to be in "good" biological condition; Belleville and Open Water were found to be in "fair" biological condition.

Fish Tissue Contaminants

Because people consume fish from the Ohio River, ORSANCO examines fish tissue for the presence of certain chemicals that may be harmful when ingested by humans on a regular basis. Yearly results are sent to the states bordering the River. Currently, each state issues its own "consumption advisories," which recommend limits on the type and amount of fish that can be safely eaten. ORSANCO is developing an Ohio River protocol for fish consumption advisories that would, if adopted by the states, provide more consistent information for people who consume Ohio River fish. ORSANCO will not, however, be issuing consumption advisories.

Great Rivers Study

Since 2004, the Commission has participated in one of the most comprehensive scientific surveys ever conducted on the great rivers of the central United States. The U.S. EPA's Environmental Monitoring and Assessment Program (EMAP) Great Rivers Ecosystems (GRE) study will provide information on the health of the Missouri, Mississippi, and Ohio rivers. ORSANCO has been instrumental in developing and implementing the GRE study. The 2009 pool surveys were the last to be intensively sampled as part of the program; the Commission can now turn its focus to assessing the data and developing a report of the study. This cooperative project will allow ORSANCO to:

- Improve understanding of relationships between various stressors and biological responses
- Improve its fish index
- Develop a macroinvertebrate index
- Develop a diatom index
- Develop a better understanding of how landscape features influence instream measures of habitat, water quality, and biology (relate measures on the mainstem to measures further in the Basin)

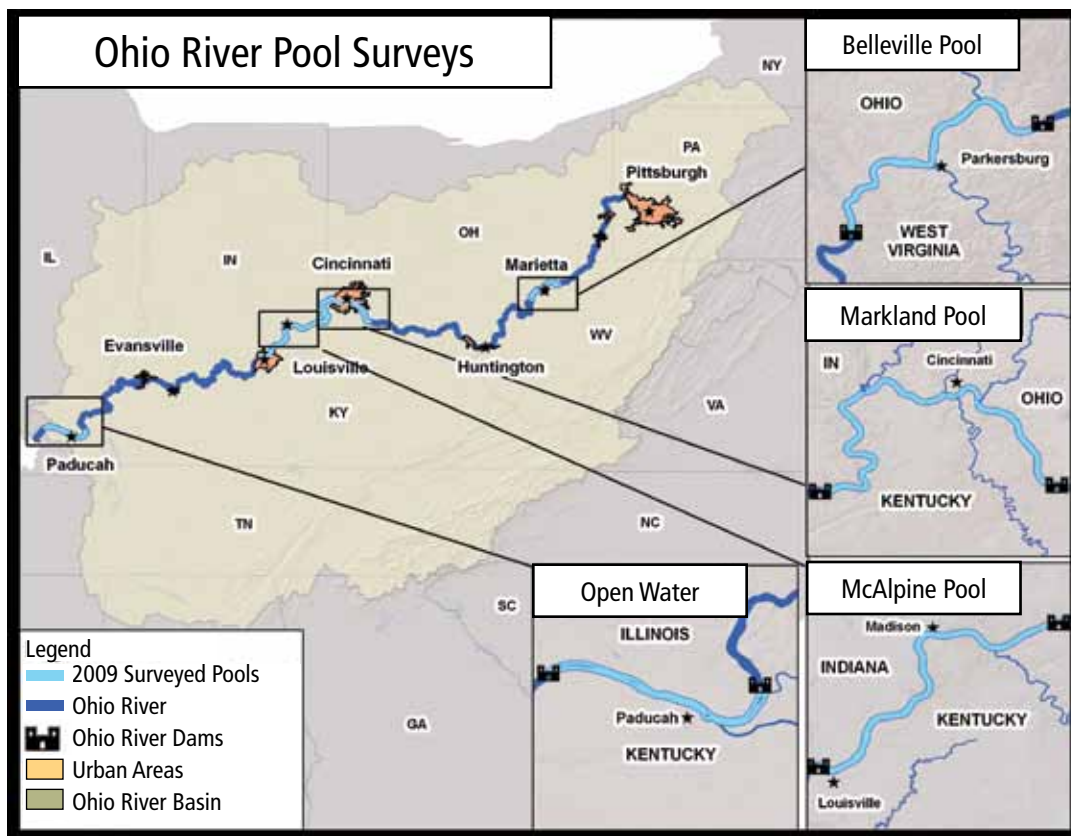


Figure A. The Ohio River Basin and the four pools selected for 2009 sampling.

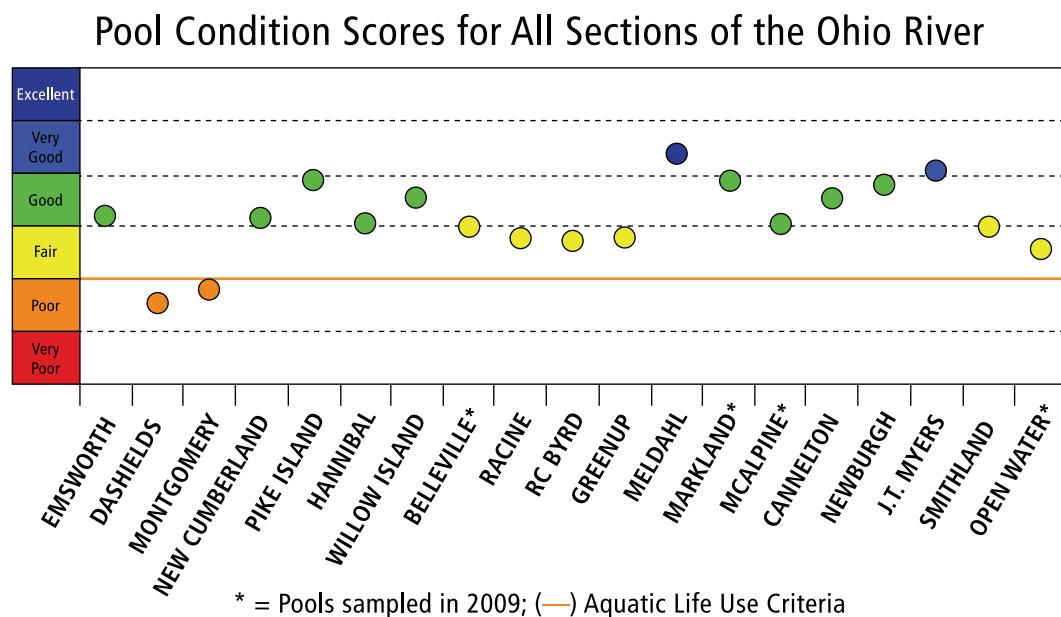
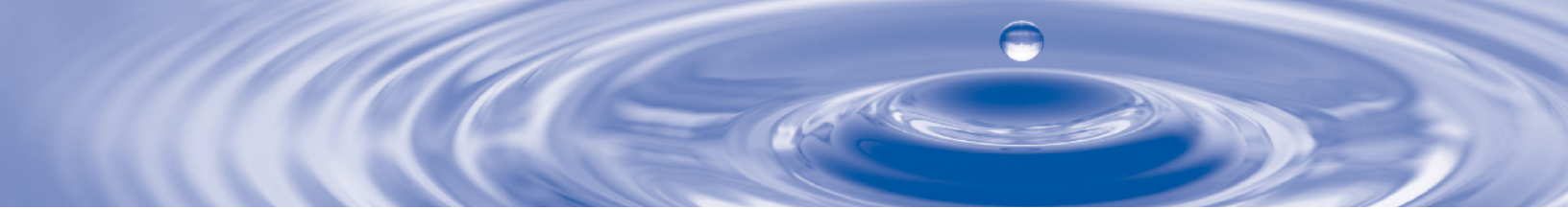


Figure B. The average quality score for each pool sampled from 2004-2009.



National Rivers and Streams Assessment Program

The Commission conducted 16 events as part of the U.S. EPA-funded National Rivers and Streams Program (NRSA). This survey will provide regional and national estimates of the condition of rivers and streams. The funds provided to ORSANCO also permitted two additional studies: a fish tissue mercury study and a pharmaceutical study, described in the research section below.

New and Noteworthy

To obtain a representative sample of the fish community, ORSANCO uses electrofishing to temporarily capture and record fish in different areas of the river. During the 2009 field season, crews collected Atlantic Needlefish near Paducah, KY and Mound City, IL. Although Atlantic Needlefish are predominantly a marine species, they have been recorded in other freshwater systems in Kentucky and Tennessee. However, this is the first time the species has been encountered in the Ohio River.



RESEARCH

Emerging Contaminants

The Commission's research into Endocrine Disrupting Compounds (EDCs) has been expanded in scope to include a broader list known as Emerging Contaminants. During the 2009 field season, samples were collected from 25 locations on the Ohio River. Each sample was screened for the presence of 121 pharmaceutical and personal care products (PPCPs), a suite of common hormones and sterols, and also for the presence of perfluorinated compounds (PFCs). ORSANCO expanded the scope of its research by working in partnership with U.S. EPA. The funding for this phase of Emerging Contaminants research is generated by the Commission's participation in U.S. EPA's NRSA Program.

Mercury in Hybrid Striped Bass

In 2009, a river-wide study was conducted to investigate the relationship between mercury concentrations in the water and in fish tissue. Large hybrid striped bass were collected from 12 locations on the Ohio River and analyzed for mercury concentrations in muscle tissue. Mercury concentrations in the water were analyzed for the six preceding years (at the same locations) to characterize the lifetime exposure by the fish. Mercury levels generally increased with fish weight, length, and age.

Genetics Projects

ORSANCO was recently awarded a grant from the Electric Power Research Institute to determine the isolating effects of Ohio River high-lift dams on fish populations. The genetic diversity of longnose gar and bluegill populations throughout the River will be examined as part of this research.

ORSANCO will work with the Cincinnati Museum of Natural History to try to genetically resolve issues associated with two species regularly encountered in the Ohio River. The Museum Center will help sequence the DNA from mimic/channel shiners and shorthead/smallmouth redhorse specimens to help better define distributions of these two species in the main stem of the Ohio River. Sequenced DNA will be compared to sequences of the species obtained from the Barcode of Life project for positive identification.





Drinking Water Security Programs

Twenty-nine public water utilities use the Ohio River as their source, supplying drinking water to over five million people. The river also receives treated industrial and municipal wastewater, and transports over 240 million tons of cargo annually. ORSANCO is the only agency with river-wide responsibilities to protect the River as a source of drinking water and the people who depend on it.

Source Water Protection

Source water protection programs connect watersheds, water users, and water consumers by identifying potential sources of contaminants and activities that could lead or contribute to water quality problems. ORSANCO's communications network provides early notification to drinking water utilities which, in turn, affords them the opportunity to develop successful countermeasures to protect drinking water quality.

In 2009, ORSANCO convened a series of meetings among drinking water utilities and upstream river users to increase awareness of drinking water use, users, and locations, thereby enhancing protection of the source water for the utilities. Meetings were convened in Portsmouth, OH (for Huntington to Portsmouth drinking water utilities), and St. Clairsville, OH (for PA state line – East Liverpool to Sistersville drinking water utilities). The Commission plans to hold additional meetings in Louisville, Evansville, and Paducah in 2010.

Emergency Response

ORSANCO receives incident reports from the National Response Center for releases to the Ohio River and its tributaries in all counties bordering the River. The incidents are evaluated for their potential to impact drinking water utilities on the Ohio River. Although there were no major spills to the Ohio River or its tributaries in 2009, the Commission's Emergency Response program continued to

coordinate and disseminate information regarding anomalous water quality conditions that could be of concern to drinking water utilities or other users.

Due to the size of the Ohio River, significant spills are rarely contained. During such spill events, ORSANCO's responsibilities extend to locating, tracking, and characterizing contaminant plumes as they move downstream.

Organics Detection System

Since 1977, ORSANCO's Organics Detection System (ODS) has protected drinking water utilities from contamination by detecting certain chemicals that have been spilled or released into the Ohio River. Once detected, the location, type, and concentration of the chemical is reported to downstream drinking water utilities as well as state and federal environmental agencies.

The current equipment is well past its design life of seven years, and the system requires major upgrades. In 2009, ORSANCO secured the final of three federal appropriations totaling \$2.5 million to upgrade all ODS analytical and communications equipment to current technology levels. For example, the old equipment was calibrated to identify and quantitate only 22 volatile organic chemicals (VOCs) and took almost an hour to process. The new equipment is calibrated to quantitate 56 VOCs and takes only 20 minutes to run.

ODS RENOVATION BENEFITS

	Current System	New System
Number of Chemicals Identified (Based on calibration mixture)	22	56
Number of Chemicals Identifiable (Based on instrument chemical library)	0	1000+
Analytical Run Time Per Sample	1 hour	20 minutes
Automated Sample Analysis	No	Yes
Data Transfer Technology	56k modem	High-speed internet (DSL)
Data Transfer Automation	No	Yes
Website for Data Processing	No	Yes



Public Outreach/Education Programs

River Sweep

River Sweep, an annual public participation campaign to remove shoreline debris from the Ohio River, celebrated its 20th anniversary in 2009. Even during this economically challenging year, corporate sponsors again signed on to support ORSANCO's efforts. Over 20,000 volunteers participated, collecting tons of trash and debris from the riverbanks. In conjunction with River Sweep, ORSANCO holds an annual poster and T-shirt design contest for students in grades K-12 living in Ohio River counties. Students submitted over 2,100 contest entries in 2009. The poster winner was Kimberly Cropper from Lewis County High School in Vanceburg, KY; the T-shirt winner was Kelsie Loveridge from Benjamin Bosse High School in Evansville, IN.

Corporate Sponsors:

Duke Energy	E.ON U.S.
Toyota	FirstEnergy
AEP	Gallatin Steel
AEP River Operations	Illinois SCALE Grant
AK Steel	Kentucky American Water
American Water	Kentucky River Authority
ArcelorMittal USA	Koppers
Ashland, Inc.	Louisville Water Company
Babst, Calland, Clements and Zomnir, P.C.	Louisville & Jefferson County MSD
Bristol-Myers Squibb Company	Massac County SWCD
Cargill	Neville Chemical Company
Casino Aztar	PPG Industries Foundation
Childers Oil Company	Rivertown Breakdown
CSX	Rumpke
Dayton Power & Light	SABIC Innovative Plastics
Dominion Foundation	Sanitation District #1 of Northern Kentucky
Domtar Corporation	U.S. Steel
Dow Corning Foundation	West Virginia American Water
DuPont Washington Works	
Duquesne Light Company	



Mobile Aquarium Display

"Life Below the Waterline," a 2,200-gallon mobile aquarium, is designed to showcase the abundant and diverse aquatic life of the Ohio River and its relationship to water quality. The aquarium displays Ohio River fish at festivals, educational fairs, and other public events in communities throughout the Ohio River Valley. ORSANCO obtains fish locally, allowing the public to learn about the aquatic life and biodiversity in their area. Fish are released back to the river following each event.

The aquarium made appearances throughout the Ohio River Valley in 2009, from Buffalo, WV to Paducah, KY. More than 2,000 students in Owensboro, KY participated in a Sierra Club-sponsored water festival that included a program on fish in the Ohio River, which featured the aquarium.

RiverWatchers

Established in 1992, RiverWatchers is an educational program that involves school and community groups interested in monitoring water quality along the Ohio River or its tributaries. RiverWatchers provides hands-on opportunities for students to increase their knowledge of water quality, focusing on the sources and impacts of pollution. The program is designed to enhance appreciation and promote stewardship of the Ohio River Watershed. RiverWatchers groups monitor water quality by measuring various parameters such as turbidity, pH, water temperature change, phosphates, nitrates, dissolved oxygen, biochemical oxygen demand, and *E. coli*. Results are submitted online and posted on the ORSANCO website.



2009 Notable RiverWatchers Achievements:

- Robby Hinshaw (Fairland High School) analyzed his RiverWatchers data for a school science fair project and has won various awards for his work, including the Ohio Environmental Health Association Science Award. He has presented at the Ohio Academy of Science and published an abstract in the Ohio Journal of Science. Robby will present at the American Junior Academy of Science in San Diego, CA in 2010.
- Bonnie Fancher (Switzerland County High School) was awarded the 2009 Earth Day Environmental Award from the Greater Cincinnati Earth Coalition for her commitment to water quality monitoring. Bonnie has worked with her students not only to collect Ohio River data for RiverWatchers but to evaluate the Indian Creek Watershed, a tributary of the Ohio River, with support from U.S. EPA and the Indiana Department of Environmental Management. She also started a school recycling program and has organized local roadside litter cleanup events.

RiverWatchers includes 24 groups within the Ohio River Basin:

INDIANA: Ivy Tech Community College, Mater Dei High School*, Switzerland County High School*

KENTUCKY: Daviess County High School*, Raceland High School, River Ridge Elementary*, Worthington Elementary*

NEW YORK: Cassadaga Valley Middle/High School, Cattaraugus-Little Valley High School, Clymer Central School, Maple Grove High School, Randolph High School

OHIO: Cincinnati State College, Fairland High School, Kings Junior High, New Richmond High School, Private Citizen (Cincinnati, OH)

PENNSYLVANIA: Private Citizen (Rochester, PA), Warren County Conservation District, Woodland Hills School District*

WEST VIRGINIA: Leon Elementary, Saint Francis Xavier School*, Wahama High School*, Warwood Middle School

*Participating schools submitting RiverWatchers data for ten years or more.



ORSANCO continued its mission to educate residents of the Ohio River Basin in part through activities of the Foundation for Ohio River Education (FORE). FORE is an autonomous Foundation established by ORSANCO in 2003. On ORSANCO's behalf, FORE conducts hands-on environmental science

programs aboard the PA Denny River Education Center, a floating classroom and laboratory housed aboard an historic paddlewheeler. In 2009, FORE reached over 2,000 residents in the Ohio River Watershed through high school and elementary programs in Cincinnati and Louisville, as well as through community outreach programs in partnership with local universities, agencies, and non-profit organizations. FORE also held workshops aboard the PA Denny River Education Center for science teachers and watershed coordinators, along with an Elderhostel program for seniors.





Advisory Committees

Throughout its history, ORSANCO has taken a collaborative approach in improving water quality, working with both public and private Ohio River stakeholders. The Commission seeks input from advisory committees representing specific river-related interests. Currently, there are four active committees.

Water Users Advisory Committee

The oldest of the Commission's advisory committees is the Water Users Advisory Committee, whose members are drinking water utilities along the Ohio River and its tributaries. This group meets several times a year to evaluate Commission programs and provide input to improve or enhance the use of the river as a source of drinking water. It assists the Commission in recognizing exemplary efforts of licensed water treatment operators through ORSANCO's Registry of Distinguished Operators.

Publicly Owned Treatment Works Advisory Committee

ORSANCO's Publicly Owned Treatment Works (POTW) Advisory Committee comprises representatives of municipal wastewater treatment utilities along the Ohio River. The committee seeks to improve the operation of municipal facilities through technology transfer, and assists the Commission in recognizing exemplary efforts of licensed wastewater treatment operators through ORSANCO's Registry of Distinguished Operators. Members also provide input on issues relating to the treatment of municipal wastes. This committee has been at the forefront of urban wet weather issues in recent years.

Power Industry Advisory Committee

For many years, ORSANCO has worked with industry advisory committees to identify new approaches to the treatment of wastes, and other opportunities to cooperate toward improved water quality. The Power Industry Advisory Committee has been the most active industry committee in recent years. Currently, the committee is involved with a review of Ohio River temperature criteria. The committee is also active in studies of Ohio River aquatic life.

Public Interest Advisory Committee

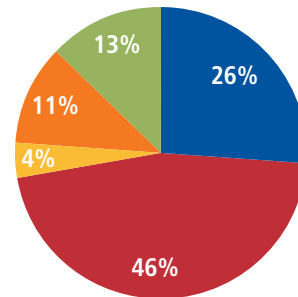
The Public Interest Advisory Committee (PIACO) is composed of one regular member from each of the signatory states, and four at-large members who represent various river interests such as marinas, fishing, and floating restaurants. This Committee provides valuable critique of, and assistance with, Commission programs, particularly on improving ways to communicate issues to the public.



Financial Report

Expenditures by Program

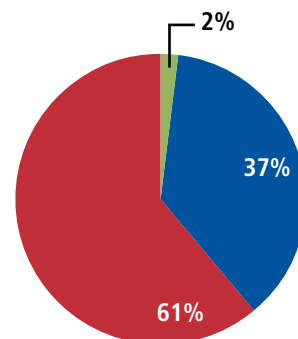
Water Quality Monitoring & Assessment	\$1,693,752
Biological Assessment & Research	\$964,769
Drinking Water Security	\$452,700
Public Outreach / Education Programs	\$399,183
Capital Improvement	\$152,430
Total	\$3,662,835



- Water Quality Monitoring & Assessment
- Biological Assessment & Research
- Drinking Water Security
- Public Outreach / Education Programs
- Capital Improvement

Revenues by Source

Federal	\$2,253,452
State Funding	\$1,363,500
Other Program Funding	\$55,556
Total	\$3,672,508



- Federal
- State Funding
- Other Program Funding

Detailed financial information can be found in the June 30, 2009 audited financial statements.



ORSANCO Staff

Alan H. Vicory, Jr., P.E., BCEE,
Executive Director & Chief Engineer

Peter Tennant, P.E., BCEE,
Deputy Executive Director

Tracey Edmonds, Administrative Assistant

Administrative Programs & Human Resources

David Bailey, Director of Administration
& Human Resources

Donna Beatsch, Data Processing Specialist

Joe Gilligan, Comptroller

Lisa Cochran, Administrative Assistant, part time

John Klear, Data Systems Administrator

Paul Spires, Sr., Head of Maintenance, part time

Source Water Protection & Emergency Response

Jerry Schulte, Manager of Source Water
Protection & Emergency Response

Travis Luncan, Environmental Chemist

Lila Xepoleas Ziolkowski, Analytical
and Environmental Chemist

Biological & Research Programs

Erich Emery, Manager of Research,
Ohio River Users & Biological Programs

Ryan Argo, Aquatic Biologist

Rob Tewes, Aquatic Biologist

Jeff Thomas, Senior Biologist

Contractual Biological Research:

John Spaeth, Aquatic Biologist

Technical Programs

Jason Heath, BCEEM,
Manager of Monitoring, Assessment & Standards Programs

Steve Braun, Environmental Specialist

Stacey Cochran, Environmental Specialist

Sam Dinkins, Environmental Specialist

Eben Hobbins, Environmental Specialist

Greg Youngstrom, Environmental Specialist

Public Information Programs

Jeanne Ison,
Manager of Public Information/Education Programs

Melissa Mann, Public Information/Education Specialist

Alexandra Stevenson, Publications, part time

Years of Service Recognition

Stacey Cochran	5 years
Erich Emery	15 years
Jason Heath	20 years
Alan H. Vicory, Jr.	30 years



Members of the Commission

Chairman: Jeffery A. Eger
Vice-Chairman: Paul Tomes
Secretary/Treasurer: Charles Duritsa
Executive Director & Chief Engineer: Alan H. Vicory, Jr., PE

ILLINOIS

Douglas Scott , Director,
Illinois Environmental Protection Agency
Constance H. Humphrey
Phillip C. Morgan

INDIANA

Joseph H. Harrison, Sr., Bowers Harrison, LLP
Thomas Easterly, Commissioner, Indiana Department
of Environmental Management
Vasiliki Keramida, Ph.D., President and
Chief Executive Officer, Keramida Environmental, Inc.

KENTUCKY

Leonard Peters, Kentucky Energy & Environment Cabinet
Daniel Mongiardo, Lieutenant Governor
Jeffery Eger, General Manager Sanitation District No. 1

NEW YORK

Douglas E. Conroe, Director of Operations,
Chautauqua Institution
Peter Grannis, Commissioner,
New York Department of Environmental Conservation
T. Lee Servatius

OHIO

Chris Korleski, Director
Ohio Environmental Protection Agency
Paul Tomes
Thomas J. Conway, President, Conway Company, LLC

PENNSYLVANIA

Greg Phillips, District Manager/CEO
Westmoreland Conservation District
John Hanger, Secretary,
Pennsylvania Department of Environmental Protection
Charles Duritsa

VIRGINIA

Joseph H. Maroon, Director,
Department of Conservation and Recreation
David Paylor, Director,
Virginia Department of Environmental Quality
Robert H. Wayland III, Virginia Water Control Board

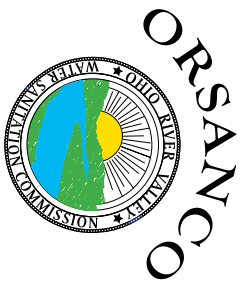
WEST VIRGINIA

Randy C. Huffman, Cabinet Secretary,
Department of Environmental Protection
David Flannery, Jackson Kelly, PLLC
Ronald R. Potesta, President, Potesta and Associates

FEDERAL

Stuart F. Bruny
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*As of December 31, 2009



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