WHAT DO YOU KNOW ABOUT PENNSYLVANIA’S RIVER BASINS?

How many river basins are there in Pennsylvania? Any answer from one to several thousand is correct. At the one extreme, since all Pennsylvania waters eventually reach the Atlantic Ocean, the entire state is part of the Atlantic basin. At the other extreme, each basin can be divided into even smaller sub-basins for each small tributary and headwater creek.

Another good answer to the question of how many basins there are in Pennsylvania is three. While all Pennsylvania waters flow to the Atlantic, they reach the ocean by three very different routes and in three locations thousand of miles from one another. The eastern two-thirds of the state drains to the mid-Atlantic. However, the western one-third of the state drains either north to the St. Lawrence River and to the north Atlantic near Newfoundland or west and eventually south to reach the Gulf of Mexico at New Orleans. In Potter County, there is a small hill that marks the boundary between these three watersheds.

More commonly, however, Pennsylvania is viewed as spanning portions of five major and two minor river basins. All seven of these basins are shared with one or more eastern or midwestern states. In total, the Commonwealth shares basins with 15 others states, the District of Columbia and Ontario Province.

The largest portion of Pennsylvania (over 46 percent of the total) is drained by the Susquehanna River. To the surprise of many Pennsylvanians, a sizable portion of southcentral Pennsylvania drains to the Potomac River via numerous headwater streams. Even less well known are the two small areas of the state that drain to the Chesapeake Bay through smaller Maryland rivers—a tiny portion of York County via the Gunpowder River and a sizable portion of Chester County via the Elk and Northeast rivers. Together these four basins make-up the Commonwealth’s Chesapeake Bay drainage and account for nearly one-half of the state’s land area.

The second largest river basin in Pennsylvania is the Ohio basin, draining more than a third of the state and flowing west to the Mississippi. The third largest basin is the Delaware, which drains the eastern 14 percent of the state.

The balance of the state (approximately 1.5 percent of the land area) is in the Great Lakes basin. Our Great Lakes drainage is in two parts — one in Erie and Crawford counties drains to Lake Erie. The other piece is in northern Potter County, where the headwaters of the Genessee River flow to Lake Ontario.

Take this quiz and see how much you know about Pennsylvania’s river basins.

PENNSYLVANIA’S RIVER BASINS QUIZ

(1) The number of watersheds in Pennsylvania is —
   (a) one
   (b) three
   (c) seven
   (d) 106
   (e) 386
   (f) all of the above

(2) The largest area of Pennsylvania, amounting to nearly half the state, lies in this basin —
   (a) the Delaware
   (b) the Ohio
   (c) the Susquehanna
   (d) the Allegheny

(3) Which of these is NOT a place where Pennsylvania waters reach the Ocean?
   (a) the north Atlantic near Newfoundland
   (b) Atlantic City, N.J.
THE OHIO, WHERE THREE RIVERS MEET

Born in Pittsburgh’s beautiful Point State Park at the confluence of the Allegheny River flowing southward and the Monongahela River flowing northward, the Ohio River begins its 981-mile journey west to the Mississippi River at Cairo, Ill. The Ohio basin is the second largest of Pennsylvania’s river basins, covering 15,614 miles of the state west of the Allegheny Mountains. Unlike the Susquehanna (three-quarters) and Delaware rivers (one-half), only about one-tenth of the Ohio basin lies in Pennsylvania.

Reportedly seen by the French Explorer Robert Cavelier sieur de La Salle in 1669, the Ohio and its tributary, the Allegheny, was called “La Belle Riviere” (the Beautiful River). In the eighteenth century, Pennsylvania’s portion of the basin was the scene for intense rivalry between the English and French as well as between the colonies of Pennsylvania and Virginia. Territorial claims and events in the region were largely responsible for the French and Indian war in the mid-1700s. In addition, the conflicts between Pennsylvania and Virginia over boundaries were not settled until three years after the Declaration of Independence was signed. Once the disputes were settled, the Ohio River became the avenue for many settlers seeking a new life in the west in the early 1800s.

Today, the Ohio basin is home to approximately 3.5 million Pennsylvanians and more than 20 million people (about 10 percent of the U.S. population) in the states of New York, Ohio, Kentucky, Virginia, West Virginia, Illinois, Indiana, Tennessee and Pennsylvania as well as portions of North Carolina and Maryland. Much of the population is centered around the areas of Pittsburgh, Cincinnati, Columbus, Evansville, Indianapolis, Knoxville, Lexington, Louisville and Nashville.

In Pennsylvania, the Ohio flows about 50 miles westward from Pittsburgh, joined by the Beaver River from the north, through Allegheny and Beaver counties, to the Ohio border. The river and its tributaries, also known as the Forks of the Ohio, have linked the region, making it one of the busiest waterway systems in the country. Barge traffic still flows along the Ohio and its tributaries in Pennsylvania. Along its 981-mile stretch, barge traffic has increased along with the commodities transported. Barge tonnage transported along the Ohio is estimated to be eight times that which is shipped on the Great Lakes System.

The economic life of the basin is dependent upon its environmental health. The basin supplies drinking water to more than 13 million citizens and the river system receives treated waste water from millions more. Due to increased waste water treatment plants and limits placed on discharges, the water quality of the Ohio River has improved over the past 50 years. With improved water quality, fish are beginning to increase and return to previous ranges.

Pennsylvania is involved with three interstate organizations dedicated to improving the quality of the Ohio River Basin. The Ohio River Basin Commission, the Ohio River Valley Water Sanitation Commission and the Ohio River Basin Consortium for Research and Education—all focused on increasing coordination on issues related to the health and stability of the basin.

The Ohio is different things to different people, but it has had an impact on shaping the history of western Pennsylvania. For those Pennsylvanians who grew up on the banks of the Ohio, the Allegheny, the Monongahela, the Beaver or the Youghiogheny, the basin is home.

<> For more information on the Ohio River, contact Larry Feazell, Ohio River Basin Commission, at 606-257-5141 or email: lfeazell@uky.campus.mci.net Jeanne Ison, Ohio Valley Water Sanitation Commission at 513-221-7719, website: http://www.orsanco.org Leo Weaver, Ohio River Basin Consortium for Research and Education at 513-232-3511 website: http://www.orsanco.org/orbcre
THE POTOMAC: OUR NATIONAL RIVER WITH HEADWATERS IN PA

Most people do not think of the Potomac as a Pennsylvania river. Indeed, the Potomac itself does not flow through the Commonwealth, although at one point near Hancock, Md. and Interstate 70, the Potomac comes within a mile or two of the Mason-Dixon Line. However, a significant portion of the Potomac River basin is in southcentral Pennsylvania.

The Potomac basin, Pennsylvania’s fourth largest, is a bit larger than the Delaware basin and about one-half the size of the Susquehanna River basin. Of it’s 14,670 square miles, 1,584 are in Pennsylvania, about 11 percent of the basin but only 3.5 percent of Pennsylvania’s land area. Most of the Potomac drainage is in five southern-tier Pennsylvania counties, from Somerset in the west to Adams in the east. The basin also includes tiny portions of Perry County (where the west branch of the Conococheague Creek reaches 60 kilometers into Pennsylvania) and southwestern Cumberland County.

Because of the drainage pattern in this portion of Pennsylvania (generally north to south), Pennsylvania’s Potomac basin is a series of headwater streams. Most of these reach the Potomac above Harpers Ferry, where the Potomac is joined by its largest tributary, the Shenandoah River.

The exceptions are the streams that drain much of Adams County. These streams are all headwaters of the Monocacy River which begins near the Mason-Dixon Line and becomes one of the larger tributaries of the Potomac.

Pennsylvania tributaries to the Potomac include (from west to east) Wills Creek, Evitts Creek (important as the site of two reservoirs which serve as water supply for Cumberland, Maryland), Town Creek, Sideling Hill Creek (an outstanding high-quality stream), Tonoloway Creek, Licking Creek, the Conococheague and Antietam Creek. Adams County headwaters to the Monocacy include Marsh and Rock creeks, which flow through the Gettysburg battlefields.

In 1996, the Potomac River became a sister river to the Arakawa River in Japan. These two rivers share an historic tie (the Arakawa was the source of the cherry trees which grace the Potomac basin in Washington, DC) and each is the river that flows through the respective national capital cities.

The Interstate Commission on the Potomac River Basin is the oldest of Pennsylvania’s compact commissions, founded in 1940 (Pennsylvania joined in 1945). Its initial mandate was to improve the water quality of the Potomac. In 1970, its charter was expanded to include a broader range of water issues, although ICPRB’s compact does not give the commission any regulatory powers. In addition to Pennsylvania, members are the states of Maryland, Virginia, West Virginia and the District of Columbia and the federal government.

<> For more information on ICPRB, contact Curtis Dalpra at 301 984-1908, ext. 107.
Pennsylvania includes portions of five major river basins—the Susquehanna, the Ohio, the Delaware, the Potomac and the Great Lakes. Together these five basins cover nearly the entire state, but not all of it. When a colonial judge decided on a line of latitude approximately 15 miles south of Philadelphia as the boundary between Pennsylvania and Maryland (later surveyed by Mason and Dixon), he was probably unaware that this line would put the headwaters of several Chesapeake Bay tributary streams in Pennsylvania. Together these streams drain 75 square miles of the Commonwealth.

Gunpowder Falls/River drains approximately 11 miles of southern York County west of Interstate 83 near New Freedom Borough. The Gunpowder is not part of the Susquehanna basin since it reaches the bay south of Havre de Grace and is therefore a small portion of the state outside of the five major basins.

An even larger area (64 square miles) of southern Chester County constitutes the headwater areas for the Northeast Creek/River and the Elk Creek/River. Like the Gunpowder, these rivers reach the bay south of Havre de Grace. This area includes much of Oxford Borough and Lincoln University.

Why is it important that these small areas of the state are not part of the Commonwealth’s five major river basins? A major reason is that both the Susquehanna and the Delaware River Basin commissions have regulatory powers over the use of water resources in their respective basins. These water withdrawal authorities do not apply in the Elk, Northeast and Gunpowder basins.

Because these 75 square miles of Pennsylvania lie outside of the jurisdiction of the interstate compacts, they are included in only one interstate agreement—the Chesapeake Bay Agreement of 1987. Through this agreement, Pennsylvania is working cooperatively with Maryland to reduce pollution and improve water resource management in these often forgotten small watersheds of southern Pennsylvania.
THE GREAT LAKES – NORTH AMERICA’S FRESHWATER RESERVOIR

Nine-tenths of all the fresh water in North America and about one-fifth of the world’s fresh surface water supply is contained in the interconnected system of five major and numerous minor lakes that stretch from Duluth, Minnesota, to the Thousand Islands area of New York. This system of lakes drains to the St. Lawrence River, flowing past the Canadian cities of Montreal and Quebec, before reaching the Atlantic through the Gulf of St. Lawrence between Labrador, Newfoundland and Nova Scotia.

The Great Lakes Basin is extensive, covering 295,000 square miles of land and water in both Canada and the United States, to the outflow of Lake Ontario where the St. Lawrence River begins. Area-wise, Pennsylvania’s portion of the basin is relatively small with a total of 610 square miles of land area (one and one-half percent) draining to two of the Great Lakes.

The largest portion of Pennsylvania’s Great Lakes basin is the Erie coastal area in Erie and Crawford Counties. Drainage in this area is generally south to north in streams like Conneaut Creek (flowing to Ohio), Elk Creek and Walnut Creek. This portion of Pennsylvania is the site of the City of Erie and Presque Isle State Park. Pennsylvania also has jurisdiction over the approximately 750 square miles of Lake Erie that extend north to the international boundary with Canada, subject to federal navigation rights.

The last of the Great Lakes to be discovered by French explorers, this region has impacted both Pennsylvania’s and the nation’s history. As part of the Treaty of Paris, which ended the Revolutionary War, Lake Erie formed part of the northern boundary with the territorial line between the American and British territories drawn down the middle of the lake. Connecticut claims over northern Pennsylvania erupted into the Yankee-Pennamite Wars. The conflict between the two states was resolved, and soon after the Pennsylvania General Assembly ordered the surveying of the northern line in 1785 and the purchase of the Erie triangle from New York state in 1792 by which Pennsylvania acquired its present boundaries. The War of 1812 produced a major naval battle in Lake Erie and gave America control of the lake. Soon after the War ended, the Great Lakes began to develop rapidly due to the capabilities of large ships on the lakes; this in turn has lead to Lake Erie being a port for intra-Great Lake transportation.

Less well known is Pennsylvania’s other Great Lakes watershed, located approximately 100 miles east of Erie in northern Potter County. Here, at the 42nd parallel, Pennsylvania’s portion of the Genesee River Basin flows through New York to Lake Ontario. On a small hillside near the village of Raymond in Potter County, three major Pennsylvania watershed basins come together. Rainfall on this hillside may travel thousands of miles in three different directions to join the ocean at New Orleans, Norfolk or Cape Race, Newfoundland.

One organization dedicated to the Great Lakes is the Great Lakes Commission. Created in 1955 by a joint legislative action of eight states and granted Congressional consent in 1968, the commission guides, protects, and advances the common interest of its membership for regional environmental quality, resource management, transportation and economic development. The commission is made up of state officials, legislators and governors’ appointees, who shape commission policy and determine priorities. Representatives from a variety of observer agencies and organizations, including Canadian interests, also participate, but do not vote, in commission activities.

Another organization Pennsylvania is involved with and Gov. Ridge is currently chair of is the Council of Great Lakes Governors. The council is a private, non-profit organization devoted to working cooperatively on public policy issues common to its eight member states: Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania and Wisconsin. Since its establishment in 1983, the council has served as a vehicle for actively addressing the many issues that arise as a result of the Great Lakes Governors collective responsibility for both the world’s largest source of fresh water and the industrial heartland of North America.

<> For more information on the Great Lakes, contact Dr. Michael J. Donahue, executive director, Great Lakes Commission, at 313-665-9135 or visit their website at www.glc.org or www.greatlakes.net

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Pennsylvania’s third largest river basin is the Delaware. Early European settlers named the river for Lord De La Warre, a colonial governor of Jamestown. The entire Delaware basin is 13,539 square miles. Nearly half of the basin—6,466 square miles—is in Pennsylvania. The Delaware basin accounts for more than 14 percent of the Commonwealth’s land area.

In colonial days, the Delaware was indeed Penn’s river and the major avenue of commerce into and out of Pennsylvania. This was true even as settlement spread westward, since the Susquehanna was not really navigable above Port Deposit, Md. Perhaps, in part, its importance to navigation accounts for the fact that, today, the Delaware is one of the few remaining free-flowing rivers in the lower 48 states.

This is not to say that the Delaware River system has escaped the dam builders. In the early 1900s, the rapidly growing New York metropolitan area began looking beyond the Hudson River watershed to supply its drinking water needs. The first New York reservoir in the Delaware basin to be completed was the relatively small (35 billion gallons) Neversink Reservoir on the Neversink River, which joins the Delaware just above the New Jersey border.

In 1955, the much larger (144 billion gallons) Pepacton Reservoir on the East Branch of the Delaware was put into service. This was followed in 1970 by the Cannonsville Reservoir (97 billion gallons) on the West Branch. All three reservoirs are connected by a series of aqueducts and tunnels to the New York City water system. Together, they represent a substantial out-of-basin transfer of water from the Delaware basin to the Hudson basin.

Downstream from New York state, after being joined by Pennsylvania’s Lackawaxen River system, the Delaware forms the boundary between New Jersey and the Commonwealth. This stretch of the Upper Delaware from Milford to Stroudsburg (once the site of the proposed Tock’s Island Dam) is now part of the national scenic river system and surrounded by the Delaware Water Gap National Recreation Area.

At Easton, the Delaware is joined by another large Pennsylvania tributary, the Lehigh River. A tidal freshwater zone begins near Trenton, N.J. In Philadelphia, the Schuylkill meets the Delaware after its journey from the anthracite coal region and through the city of Reading.

Below Philadelphia/Camden, the Delaware becomes increasingly saline. It passes the city of Chester and becomes the boundary between the state of Delaware and southern New Jersey and begins to widen into the Delaware estuary, merging with the Atlantic between Cape May, N.J. and Cape Henlopen, Del. The shape of the Delaware Estuary and its openness to the ocean tides reduce the Delaware Estuary’s susceptibility to summertime low oxygen, conditions that plague other estuaries like the Chesapeake Bay.

A small northeastern corner of Maryland is actually part of the Delaware River basin. More significantly, the Delaware estuary is hydrologically connected to the Chesapeake Bay by the C & D Canal, an important shipping link between the ports of Philadelphia, Camden and Wilmington on the Delaware and the port of Baltimore.

The Delaware River Basin Commission was founded in 1961, partly out of concern for water allocations and out-of-basin transfers in the New York portion of the basin. As a result, the compact for DRBC includes broad powers to manage the allocation of water and to arbitrate differences among the compact members.

Members of the compact are the federal government and the states of New York, Pennsylvania, New Jersey and Delaware. In addition to its water allocation powers, the DRBC was instrumental in the cleanup of the river and the estuary, which has restored the health of the river system. In the fall of 1996, as a part of the National Estuary Program, a comprehensive management plan for the lower Delaware basin was adopted to ensure the continued health of the Delaware Estuary.

<> For more information on DRBC, contact Chris Roberts at 609 883-9500, ext. 205, or visit DRBC’s website at http://www.state.nj.us/drbc/drbc.htm For more information on the Delaware Estuary Program, contact the Partnership for the Delaware Estuary Program, Inc. at 800 445-4935.

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Perhaps more than any other river, the Susquehanna is considered Pennsylvania’s river. The Susquehanna basin encompasses more of the state’s land area than any other basin — 20,960 square miles, or 46 percent of the state. More than three-quarters of the entire basin lies in Pennsylvania.

Pennsylvania shares the Susquehanna basin with New York and Maryland. The river begins at Otsego Lake near Cooperstown, New York. Other headwater tributaries in New York include the Unadilla, the Chenango, the Otsego and the Tioughnoiga rivers, all of which flow to Binghamton, the largest New York city in the basin.

To the west, headwater streams in New York include the Cohocton and Canisteo rivers, and in Pennsylvania (upstream of New York), the Cowanesque and Tioga rivers—all forming the Chemung River flowing through Elmira before joining the Susquehanna in Pennsylvania’s northern Bradford County. In total, 6,275 square miles of New York drain to the Susquehanna.

In Pennsylvania, the Susquehanna flows south and east before turning southwest above Wilkes-Barre. At Sunbury, the Susquehanna is joined by its largest tributary, the West Branch Susquehanna. From Sunbury, the river flows south to the state’s capital city, Harrisburg, being joined north of Harrisburg by another large tributary, the Juniata. Beyond Harrisburg, the Susquehanna again turns southeast forming the boundary between York and Lancaster counties to the Mason-Dixon line. The river ends at Havre de Grace, Maryland, downstream from the Conowingo Dam, one of four large dams on the lower Susquehanna.

Only a small portion of Maryland, 275 square miles, lies in the Susquehanna River basin. Size alone, however, belies the importance of the Susquehanna to Maryland. The Susquehanna is the largest source of fresh water to the Chesapeake Bay, the nation’s largest estuary and an important economic and recreational resource for Maryland. Indeed, during the last ice age, the Susquehanna was nearly 200 miles longer than its current 444-mile length. As the ice sheets retreated and sea level rose, the mouth of the Susquehanna was flooded, eventually forming the Chesapeake.

Today, the Susquehanna remains one of the largest rivers on the eastern coast of the United States. It is one of Pennsylvania’s most important resources, providing drinking water, recreation, and hydropower to millions of people.

In 1971, the Susquehanna River Basin Commission (SRBC) was formed. Members of the commission are the states of New York, Pennsylvania, Maryland, and the federal government. Like most of the interstate commissions, SRBC exists to ensure the wise management and protection of the water resources of the basin and to resolve interstate water resource concerns.

<> For more information on the Susquehanna River basin or SRBC, contact Susan Obleski, SRBC public information specialist, at 717 238-0423, or visit the SRBC home page at http://www.srbc.net
<table>
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<tr>
<th>BASIN NAME</th>
<th>BASIN SIZE (Sq. Miles)</th>
<th>AREA IN PA (Sq. Miles)</th>
<th>PERCENT OF BASIN IN PA</th>
<th>PERCENT OF PA IN BASIN</th>
<th>POLITICAL JURISDICTIONS IN THE BASIN</th>
<th>POPULATION IN PA</th>
<th>POPULATION DENSITY</th>
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<td>27,510</td>
<td>20,960</td>
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<td>15,614</td>
<td>10%</td>
<td>34 1/2%</td>
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<td>221/sq.mi.</td>
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<td>Delaware</td>
<td>13,539</td>
<td>6,466</td>
<td>48%</td>
<td>14 1/4%</td>
<td>New York, PA, New Jersey, Delaware, &amp; Maryland</td>
<td>4,900,000</td>
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<td>1,584</td>
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<td>W. Virginia, Virginia, PA, Maryland, &amp; District of Columbia</td>
<td>140,000</td>
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<td>Great Lakes</td>
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<td>1 1/2%</td>
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*NOTE: These four basins all drain to the Chesapeake Bay. Together they make-up nearly one-half of Pennsylvania's land area.
\1 Does not include the Tennessee River basin.
\2 Includes both land and water surface area to the outlet of Lake Ontario.

11/12/97
PENNSYLVANIA'S INTERSTATE DRAINAGE BASINS