

Delaware's WATERWORLD

Questions and facts that will quench your thirst for knowledge about the First State's H₂O

Online quiz and interactive graphic
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Special to The News Journal

10 FUN FACTS

Ports of call: Many of Delaware's municipalities developed two or three centuries ago by Europeans who liked living and working near waterways for either relatively easy and cheap transportation (by boat) or power (for mills) – or both.

All the way over: When drawing boundaries, most states go halfway into a river, but not Delaware for its northeastern edge. That's because the arc that forms the state's top border was decreed in 1682 to continue into the Delaware River until you actually land in New Jersey.

The great divide: The peninsular divide is a line drawn by nature that splits Delaware from top to bottom. Precipitation falling on one side eventually reaches the Delaware Bay; on the other side it goes to the Chesapeake Bay. A Water Resources Agency map splits the state into four major watersheds, referring to the areas that drain into the same waterways. The greenish ones in the northwest are called the Piedmont; the light blue ones in the east drain to the Delaware estuary; and the blue ones to the southeast drain to the Inland Bays. The red ones on the west drain into the Chesapeake, and you can see the peninsular divide starting in Maryland and moving into Delaware south of Newark and steadily heading east as you move south.

Piedmont and eastern Delaware: Waterways drain into the Delaware estuary.

Peninsular divide line

Southeast Delaware: Waterways drain into the Inland Bays.

Western Delaware: Waterways drain into the Chesapeake Bay.

The Patrick Principle: Ruth Patrick, the first environmentalist to serve on the DuPont Co. board of directors, is known for developing the Patrick Principle. As The New York Times explained when she died in September at age 105, it means "the number and kinds of species in a body of water" indicate its health. She specialized in research on one-celled organisms called diatoms and was co-founder of the Stroud Water Research Center in Avondale, Pa.

Canals run through it: The busiest canal in the country is the Chesapeake & Delaware – 35 feet deep, 450 feet wide and 14 miles long. It was first suggested by 17th century settler Augustine Herman, but it didn't open until 1829, and it has been improved several times since. The Lewes-Rehoboth Canal has its own support group (<http://canal-connection.org/>) and new prominence from water taxi service. The three-mile Assawoman Canal in Sussex County is part of Holts Landing State Park.

Drinkability: The salt line refers to where fresh water meets salt water, and the mix is too salty to drink. For the Delaware, the line is usually around the Delaware Memorial Bridge, according to the Partnership for the Delaware Estuary, but heavy rains will push it south, and a drought in the 1960s allowed it to creep up to northern Philadelphia.

Clean, not-so-clean water: The world's largest water filtration system was installed in Philadelphia in the early 1900s. Unfortunately, according to the Partnership for the Delaware Estuary, treatment upriver was insufficient to maintain oxygen levels, so through the 1950s, no fish lived in the river there.

Baseball's dirty secret: Since the 1950s, all new balls used in Major League Baseball have been primed with mud harvested from an undisclosed tributary on the Delaware in South Jersey. It all comes from a firm called Lena Blackburne Baseball Rubbing Mud.

Man-made lake: Delaware's biggest freshwater lake, the 200-acre Lums Pond that forms the centerpiece of a state park, was created about two centuries ago by damming St. Georges Creek.

Best-tasting water: For the second year in a row, water from Tidewater Utilities was named best tasting in the state in a competition run by the Delaware Rural Association. The entry, from Oak Orchard, goes on to a national competition, the company said. Criteria included "appearance, odor, flavor, mouth-feel, aftertaste and overall impression."

10 INTERESTING BODIES OF WATER

1 Appoquinimink River: For nine years, ending in June, it had a support group, the Appoquinimink River Association. Tributaries include the evocatively named Deep Creek, Drawyers Creek and Hangmans Run.

2 Blackbird Creek: A case involving a dam on the creek that reached the U.S. Supreme Court in 1829 is considered an important part in defining the dormant commerce clause, which prohibits "a state from passing legislation that improperly burdens or discriminates against interstate commerce," according to Princeton University.

3 The Brandywine: After the Delaware, this creek/river probably had the greatest historical impact with mills that were set up on it, north of Wilmington, to use free power of the fast-flowing water. People disagree on whether the name comes from mill owner Andreas Brainwende (an alternate version of his name, Brantwyn, lives on in a du Pont family house that's now part of the DuPont Country Club) or brandewijn, the Dutch word for brandy.

4 Broadkill River: The river was popular for shipbuilding early in the 19th century, and you can get close to it today in downtown Milton on the Governor's Walk.

5 Christina River: This river was named for the queen of Sweden at the time of the first European settlement of Wilmington in 1638, and its branches – including the White Clay Creek, Mill Creek and Red Clay Creek – have all lent their names to other things on the map.

6 Delaware River: The state's biggest river starts with two branches in New York, includes 200 tributaries and runs 330 miles before reaching the Atlantic Ocean. It is the longest undammed river east of the Mississippi. Famous things on it before it reaches Delaware include the Delaware Water Gap National Recreation Area, the spot where George Washington crossed on Christmas Day 1776 and the federally designated Central Delaware Valley American Viticultural Area for vineyards.

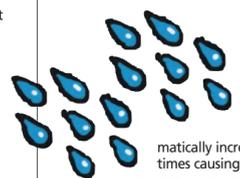
7 Indian River Inlet: The Indian River Inlet, which connects the Inland Bays in Sussex County and the Atlantic sometimes exists, and sometimes it doesn't. According to the Delaware Center for the Inland Bays, it has "complex history" of opening, closing – and moving (averaging 153 feet a year northward from 1800 to 1843). Some changes occur dramatically in storms, particularly the nor'easter of 1962; some are result of human intervention; and some are nature's slow processes.

8 Nanticoke River: The nation's first national historic water trail was declared along with the Chesapeake and its tributaries in 2006 to mark the explorations of John Smith four centuries before. The Nanticoke River Water Trail runs 41 miles, from the mouth of the river to Seaford, and one interesting point is Phillips Landing, a small park that Smith is known to have visited in June 1608. A tributary of the Nanticoke is Broad Creek, which leads up to Bethel, known for shipbuilding more than a century ago.

9 Shellpot Creek: This creek, which crosses U.S. 13 just north of Wilmington, gets its name from skölpadda, the Swedish word for turtle. That area was once famous for an amusement park.

10 White Clay Creek: This waterway is the only one in Delaware that's part of the National Wild and Scenic River program. It's the first designated on a watershed basis, Gerald J. Kauffman, state water coordinator said. This designation enhances "water quality, natural resources and the overall quality of life," the White Clay Creek Steering Committee says on <http://whiteclay.org>.

10 QUESTIONS



Is there enough water?

Yes, said Gerald J. Kauffman, project director of the Water Resources Agency and state water coordinator. Current rainfall exceeds usage, and he said studies foresee no issues through 2030. Precipitation from 1981 to 2010 averaged 2 to 5 inches a month, according to the Delaware Geological Survey. Over that time, according to the Partnership for the Delaware Estuary, rainfall has dramatically increased, and days of heavy rainfall have also increased, at times causing flooding.

What is Delaware's water used for?

Fifteen million people rely on the Delaware River, its streams and groundwater, according to the Partnership for the Delaware Estuary. The nonprofit in a 2012 report says 8 billion gallons are used daily in the basin, with 79 percent going to industry and power generation. Use is relative. The water used by power plants ends up as steam in the air or as warmer water back in the waterways.

How can you protect Delaware's water?

- Favor native plants, which don't need watering, even in Delaware's typical summer droughts.
- Plant trees. "They soak up rain and purify water," Kauffman said.
- Reduce fertilizer and pesticide use, or use slow-release or organic fertilizers.
- Don't pour harmful stuff down the drain. Used motor oil can be disposed over at several Delaware Solid Waste Authority drop-off centers.

What's in Delaware's drinking water?

Since 1974, federal law has required systems that serve at least 25 people to test their water. Wilmington's water division, for example, says in its latest annual report that it monitors for more than 100 contaminants in water sources, filtrations plants and customers' taps. The federal Environmental Protection Agency sets limits on various contaminants. Some occur naturally, and some enter the supply from businesses, homes, wild animals and farms. Common contaminants include nitrates, iron (which turns water orange) and sulfur (with its distinctive aroma).

How is the public water treated?

The process depends upon the source, according to Joe DiNunzio of Artesian Resources. Most of its supply comes from wells, and chlorine is added to disinfect it, and fluoride is added to strengthen teeth. Its water treatment process also includes removing iron and adjusting the water to a neutral pH.

Why so many road signs announcing watersheds?

Pride of ownership. "If people can identify their home watershed, they are more likely to adopt behavior to protect it," Kauffman said. But first, people need to understand the term. "A watershed is all the land that sheds water into the stream when it rains," according to the Partnership for the Delaware Estuary. "A basin is a large watershed, or several watersheds, that all drain to one waterway." An estuary, by the way, is the part of the river that is tidal, where fresh and salt water mix. For the Delaware, that's up to Trenton, N.J.

How does water from home wells differ from water supplied by municipalities and companies?

"Most people couldn't tell the difference," said Dave Kelly, president of the Maryland-Delaware Water Well Association. Home wells don't fall under as many laws, but families are recommended to test their water annually, and many use chemicals to filter sediment and adjust the pH, he said. Chlorination and fluoridation are unlikely additions, so families who drink from their wells may need regular fluoride treatments from their dentists, he said.

Where does our water come from?

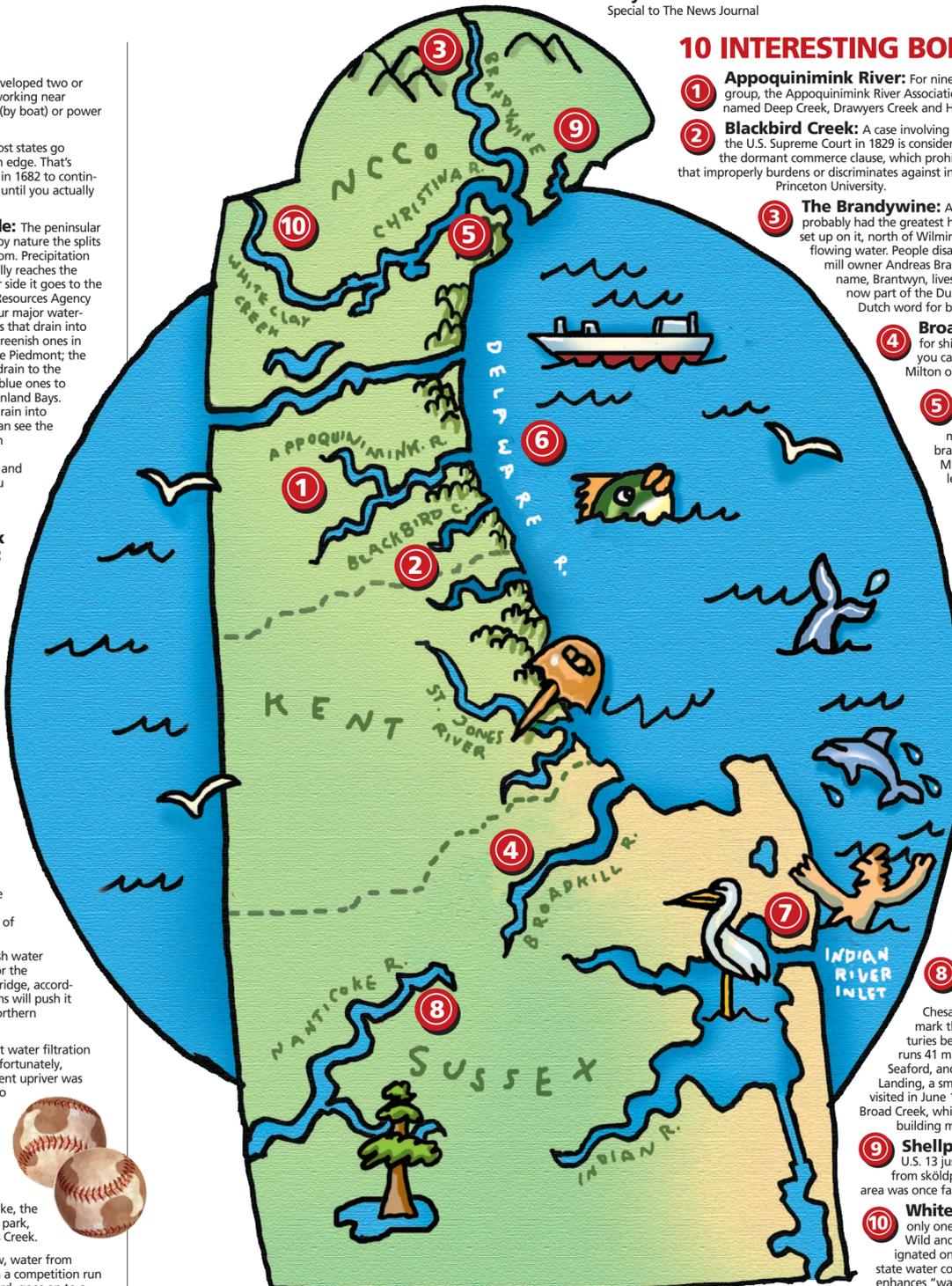
South of the Chesapeake & Delaware Canal, all water used for public and domestic supply and more than 98 percent of water used for irrigation is pumped from underground, according to the Delaware Geological Survey. North of the canal, 70 of public water comes from creeks and rivers, with the rest from groundwater.

Who manages Delaware's water?

Kauffman ticked off 60 local governments, six state agencies, 20 federal agencies and 30 nonprofits. (Companies and people care, too.) Divisions of Delaware's departments of Natural Resources and Environmental Control and Health and Social Services together regulate the use and quality of water.

How is water quality in bodies of water monitored?

At the Delaware Center for the Inland Bays, the most significant tests include pH, temperature, dissolved oxygen, turbidity, and nitrogen and phosphorus (nutrients from varied sources), according to Sally Boswell, education and outreach coordinator. You can test your local body of water and contribute to a global database via www.worldwatermonitoringday.org.



Design and graphics by Dan Garrow/The News Journal