

Natural resources

Running dry? Maryland's growth could threaten water supplies, and towns have been forced to curtail development

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To house its growing congregation, St. James Episcopal Church in Mount Airy wants to build a bigger sanctuary and nursery school on a 12-acre campus a mile north of its historic home on Main Street.

But groundbreaking for the new \$2.6 million church complex has been on hold for months until more water can be found.

So have other projects aimed at reviving the old Main Street of this one-time whistle-stop community straddling the Carroll and Frederick county lines.

"Who would have thought somebody living in Maryland, where it's rainy, would have a problem with water?" asked the town's mayor, James Holt.

Yet in more and more places around Maryland, water is becoming a problem - or at least a nagging worry.

Mount Airy and two other growing towns in Carroll and Frederick counties have been forced to curtail development - either voluntarily or under orders from the state - because their growth was outstripping water supplies.

In Southern Maryland, the state's fastest-growing region, groundwater levels are dropping an average of 1 to 2 feet a year. And in Garrett County, students at Northern High School had to have drinking water trucked in until a few weeks ago after the school's well faltered during a dry spell last summer.

It's not as if the state is on the verge of becoming a desert. Maryland is a watery playground, a boater's and fisherman's paradise. It is dotted with lakes and reservoirs, and laced with rivers and streams that feed into the world's largest estuary. Rain and snow normally soak the landscape, from an average of 36 inches out west to 46 inches in the Baltimore region.

Nevertheless, the state's growing population is straining its water-supply networks, experts say, making it increasingly vulnerable to drought. Unless steps are taken,

shortages and water-use restrictions could become a chronic woe in some parts of the state.

Maryland's population grew by 35 percent from 1970 to 2000, and it's projected to swell by an additional 20 percent - or 1.1 million people - over the next 25 years.

"I think water is going to be the critical limiting factor in how Maryland develops, or doesn't develop," said Eugene A. Piotrowski, the Department of Natural Resources' director of resource planning.

Developers and small-town officials with big growth plans are proposing to build reservoirs and jockeying for the rights to water from state forests and parkland. Competition over water has triggered lawsuits in Calvert County, while other local officials are drilling deeper wells, building storage towers and laying new pipelines to keep the precious liquid flowing.

Need for planning

Keeping water shortages at bay, experts say, will require a combination of new sources and conservation, plus much better growth planning and collaboration by government at all levels. Greater public awareness is also vital, they say.

Statewide, nearly 1.5 billion gallons of fresh water are withdrawn daily from streams, reservoirs and wells to furnish drinking water, irrigate farm fields, generate power and run factories.

By 2030, planners project, demand for water could grow by 16 percent, an extra 233 million gallons a day.

"Are there places in Maryland that are in danger of running out of water? The answer is a qualified 'probably', not a definite 'no'," says M. Gordon "Reds" Wolman, a geography professor at the Johns Hopkins University and chairman of the state's water advisory committee.

Twice in the past seven years, droughts have caused serious shortages around the state, with reservoirs and wells nearly running dry and restrictions placed on lawn watering, car washing and other major water uses. Experts say the dry spells exposed shortcomings in water supply - problems that could worsen as Maryland's population grows fastest in some areas where water is increasingly difficult and costly to find.

Making matters worse, experts say, local officials sometimes plan for growth without taking steps to ensure that there is enough water.

Eighty-four percent of the state's population gets its water from public systems, which appear adequate for now but are vulnerable to drought and can grow only so much.

The Baltimore metropolitan system, with its three large reservoirs, and the Washington Suburban Sanitary Commission, which draws heavily from the Potomac River, serve 60 percent of all Marylanders. One dispute between Virginia and Maryland over the right to the river's water went to the Supreme Court - possibly a harbinger of future fights over water.

Among the regions most at risk for shortages are those heavily dependent on groundwater, experts say.

A recent study by the Maryland Geological Survey, eyeing the 37 percent population growth projected in Southern Maryland, warns that the aquifer serving parts of Charles County could be in danger of depletion in 25 years unless deeper and costlier wells are drilled there.

'Not working'

"The way we're going now is not working," said state Sen. Roy P. Dyson, a Democrat, who represents St. Mary's and Charles counties. "Some day we'll wake up and say, 'Oh, my God, where are we going to get our water?'"

The availability of drinkable groundwater varies in Maryland. In the coastal plain that runs east and south of Baltimore, water has collected in vast underground aquifers, layers of porous sand and gravel that retain moisture. Like a tilted layer cake, the water-bearing aquifers are separated by thin sheets of clay or other relatively impervious soils or rock. Getting water involves drilling a well down into one of the aquifers and sucking it out, like poking a straw into a saturated sponge sandwiched between sheets of cardboard.

The water found in the deeper aquifers in the coastal plain seeped into them from the surface thousands of years ago, ensuring a relatively steady supply even in severe droughts. But heavy withdrawals from one or more wells using the same aquifer can cause other wells nearby to run dry, and if too much is removed over time throughout the aquifer, it could be depleted, experts warn.

In the rolling hills and mountains to the west, finding water underground is less predictable. Beneath the surface soil is a mixture of clay and rocks leading down to bedrock. The top of the bedrock is cracked and broken by weathering, allowing spaces for water to collect. The crazy-quilt pattern of such subsurface rock fractures forms an irregular network of natural "pipelines" that slowly feed water into springs, wetlands, streams and wells.

"The Piedmont provinces are much stingier in terms of water yield," says Virginia Kearney, deputy director of water management for the Maryland Department of the Environment. "You can get lucky and hit a crack or a fissure in the rock that's a good producer, but you could also drill a lot of dry wells."

State law requires counties and municipalities to ensure adequate water and waste treatment for any new development, but many localities have not kept their plans up to

date or adjusted them to reflect planned development. Only 10 of the state's 23 counties have up-to-date plans, according to the Maryland Department of the Environment.

Lack of staff

County officials often say they lack the staff to keep water plans in step with growth. The state agencies charged with helping the localities are also short-handed. The MDE, which regulates water withdrawals, cut its plan review staff from nine to one a few years ago. The number of state planners involved also dwindled from four to one, according to a 2004 report by the state's water resources advisory committee.

MDE officials say they have reassigned other staff to pick up the slack, but officials say the agencies still lack the resources to effectively plan for providing more water as demand grows. State planning officials, for instance, cannot even say how many counties and municipalities have updated their "comprehensive plans," development blueprints that by state law must be reviewed every six years and guide water supply.

"There's no meaningful enforcement either of comprehensive plans or water and sewer plans," Laurence Fogelson, manager of water and sewer planning at the state Department of Planning, told the state's water resources advisory committee recently.

The state environmental agency has cracked down in cases where it discovered local officials approving more growth than the community has water to serve.

In 2004, for example, state regulators took the extreme step of halting all construction in Middletown, in Frederick County, saying town officials had ignored repeated warnings that growth was using up the community's water supply.

Since then, after drilling 24 dry holes, the town acquired last year a new well that produces enough water to serve at least some new development. The construction ban has eased, though Middletown must still get state approval before issuing more building permits.

"We are just the tip of the iceberg," says town Administrator Andrew J. Bowen, of a problem that he expects to affect much of the East Coast. "As the population grows, quality drinking water is going to be more and more of an issue, and it's not going to go away," he says.

Seeking to avoid more Middletowns, state environmental officials have stepped in to limit development in Mount Airy and Taneytown in Carroll County until those towns find more water.

Unable to find more water by drilling wells, Mount Airy is looking to nearby rivers or streams. Town officials are studying whether to run a pipeline to the South Branch of the Patapsco River or to Gillis Falls, a Patapsco tributary. A third option may be hooking up to a pipeline Frederick County uses to draw water from the Potomac River.

In the meantime, St. James Church and another downtown project have found a way to proceed - by diverting groundwater allocated to homes that have yet to be built.

Not far away, Taneytown officials are working to stretch the supply by fixing leaks in pipes. They are also looking to acquire water rights to land outside town, build a reservoir or tap into a nearby creek.

With groundwater in the Piedmont region recharged from nearby stream drainage areas, state regulators have insisted that there be roughly an acre of land available for replenishing the water used by every household hooked up to a well.

But the state's policy of 1 acre per household encourages suburban sprawl, officials say, by raising barriers to concentrating new development in and around towns and cities.

"This could smack in the face of Smart Growth," acknowledges Herbert M. Sachs, a water supply coordinator at the MDE, referring to the state's pioneering anti-sprawl law.

"If a community wants to expand and we tell them they need so many acres of land to withdraw [water] from, they're going to look to annex or swing some deals on the outside."

A scramble begins

That's already happening. The building restrictions have set off a scramble among local officials and developers for water rights on undeveloped lands, even state parks.

State natural resources officials say they have received about 10 requests in recent months for access to water in state parks and forests, either by piping it from public lands or by claiming the right to pump more water from their nearby wells.

Boonsboro, in Washington County, has asked about acquiring the groundwater allocation for 325 acres in the state's South Mountain Battlefield Park. Boonsboro manager John Kendall says more water is needed to serve a wave of growth expected over the next 15 to 20 years that could more than double the town's population.

More than 50 other towns and cities border state parks and forests and may follow suit if Boonsboro is successful.

"This is only going to increase in the future," said Piotrowski, the DNR's director of resource planning.

Local officials and developers are also beginning to inquire about claiming groundwater allotted to farmland that has been preserved from development.

While such deals might help Smart Growth, state officials say they are leery of giving away or even selling water that might be essential to sustaining forests and future farming operations.

"The question we don't see being asked is, should there be any growth in Boonsboro at all?" the DNR's Piotrowski says.

Some residents in Mount Airy have raised similar concerns, pointing out that town officials approved more new housing than the town's wells could serve, and then seemed all too willing to strike an annexation deal for Patapsco River water with a developer who wants to build hundreds more homes.

"If we can't find water, there shouldn't be more development," says John Woodhull, a critic of the way the town has grown.

The water problems are different in Southern Maryland, where water is easier to find. Though less vulnerable to short-term droughts, those aquifers can still be drained as more and more wells are sunk into them.

Calvert County officials recently pledged to stop issuing building permits for the Lusby area after pumping more water than allowed by the state from two wells serving the area. The county has applied for permission to nearly double how much it pumps from those two wells, each more than 600 feet deep into the Aquia aquifer.

The request is opposed, however, by the Chesapeake Water Association, a private utility that fears the increased withdrawals could harm area wells, including the four it owns to serve about 10,000 customers there.

"The groundwater in Southern Maryland is being depleted rather quickly," contends George Hanson, general manager of the association.

Pumping too much in one place can cause localized "cones of depression," where water levels drop. That can pose problems for nearby shallower wells or for older wells with pumps that cannot adjust to the lower water levels.

County officials have estimated that the increased pumping will lower water levels in the vicinity by about 4 feet a year. But groundwater levels there have been dropping 6 feet a year, so the total decline could be as much as 120 feet in the next 12 years.

"We're pulling water out of the ground faster than it can come in," Hanson contends.

County and state officials dismiss Hanson's concerns, pointing to a study last year by the Maryland Geological Survey.

It predicted that the aquifers supplying water in most of Southern Maryland should be able to withstand the increased pumping expected as the region's population grows over the next 25 years.

Drilling deeper

In Charles County, though, the study warns that pumping from the heavily used Magothy aquifer cannot increase much more without dipping below the sustainability threshold set by state regulators.

Dropping groundwater levels could affect stream flows, the study adds, and dry out some wetlands.

Around Indian Head, more pumping could draw salty Potomac River water into wells, rendering them unusable.

With well problems cropping up in some areas, Charles County has been drilling deeper for its public water system to avoid causing homeowners' wells to run dry. The county has also erected water towers in the Bryans Road area to ease the strain on wells there and extended a pipeline to connect with the Washington-area water system to help supply the booming Waldorf area.

Well drillers say the water is there in most of Southern Maryland, though it can cost \$10,000 or more to drill 550 feet down.

West of U.S. 301 in Charles County, though, wells must be drilled as much as 1,000 feet down into the Patapsco aquifers. The ground there "fights you every step of the way," said Sharon Morris, co-owner of Calvert Well Drilling, and drillers must sometimes try repeatedly before finding adequate water.

No easy remedies

There are no easy solutions to the state's complex water needs and problems, experts say. Rivers do not offer an unlimited or drought-proof supply, and new reservoirs are costly and potentially troublesome environmentally.

Some communities in Florida and elsewhere with extremely limited water have gone to desalination of seawater, but that is a costly solution not under consideration for Maryland.

The key, for now, is more coordinated planning: involving officials at all levels of government, including in neighboring states.

Wolman, head of the state's water-resources advisory panel, says that officials need to step up their efforts to prevent and clean up contaminated ground and surface water.

"You can't separate quality from quantity if you're going to talk about available water," he says.

Geologists have begun detailed studies of coastal plain aquifers, with the aim of developing sophisticated computer models that would help regulators ensure a safe water supply for the state's fastest-growing region.

The effort is expected to take six to eight years and cost up to \$12 million.

"What's the sustainability of the resource?" asks James Gerhart, director of the regional water science center for the U.S. Geological Survey in Baltimore.

"Our goal is to look at it in one big picture," he adds, and to produce a water "budget" for the region.

While funding has been provided for the first year of the coastal plain study, the federal agency found itself forced last month to shut down six stream gages in the coastal plain last month.

Stream gages are instruments that scientists need to understand how ground and surface water in the region interact.

Experts say the stream-gage cuts reflect a larger problem: Politicians and the public seem to care about water only when it isn't there.

"We live in a humid, temperate climate where people just don't think of shortages," said Robert J. Shedlock, associate director of the regional water science center. "Droughts have made people think of water, but they tend to forget."

At the conclusion of a recent meeting of the state's water advisory panel, Chairman Wolman offered this benediction: "Quietly pray for drought - and only half mean it."

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