



## Maps show where Bay's treasures are threatened by development

By Karl Blankenship

When Dan Marcucci visits local planners in southcentral Pennsylvania these days, he takes along computer-generated maps that clearly show what's coming to their backyards.

Even if the Pennsylvania–Maryland border were not on the map, it would be evident by the red blotches that start at the state line. The blotches are predicted development hot spots. They also smother green and brown areas on other maps in Marcucci's portfolio indicating areas important for water quality or prime farm soils.

Marcucci, a regional planner with the nonprofit South Central Assembly for Effective Governance, calls it the "Mason-Dixon effect," in which development leapfrogs from Maryland's metropolitan areas, over the state's farmlands—and onto agricultural land in Pennsylvania, where zoning tends to be less strict.

His message to local officials is simple: This is what's happening. It's going to get worse. "I'm not saying that the growth is bad. I'm not even saying that the growth is preventable," Marcucci said. "But if you know that the growth is coming, you can plan for the types of communities that you want and the types of conservation that you want."

The tool he uses to drive home his point is a new product from the Bay Program that graphically shows where valuable resources are located—and where they are most threatened by development.

The Resource Land Assessment is a computer-based inventory of forests, farms and wetlands that draws on information from dozens of sources about land cover, roads, protected areas, flood plains, imperviousness and other topics. The resulting maps provide a watershedwide perspective about the location of prime ecological areas, key areas for water quality protection, prime farmland and more.

It also includes a vulnerability analysis—a map that shows the lands most likely to be developed based on recent trends. That analysis indicates that what's happening in Marcucci's portion of the watershed is not unlike what's happening in other areas. The map showing vulnerable areas is a blotchy mess in which the watershed is left looking as if it has been the victim of a paintball gun attack.

"This has really changed my perspective on the need for land conservation and preservation in this area," said Carin Bisland, associate director for ecosystem management with the EPA's Bay Program Office. "The billions of dollars we're spending on Bay restoration don't matter if we are going to continue to let this happen."

The health of the Bay is closely related to the health of the watershed. When Capt. John Smith explored it nearly 400 years ago, he described a "faire Bay" fed by "clear rivers and brooks." But 95 percent of the watershed was forested at the time. Since then, much of the forests—especially those closest to the Bay—have been replaced by farmland, which is declining in the watershed, and cities and their surrounding suburbs, which are rapidly expanding.

The changes have sent huge increases of nutrients into the Bay. Paved surfaces on developed lands are particularly effective at collecting pollutants and shunting them to local streams, not only degrading water

quality, but radically altering local hydrology—resulting in huge flushes of water during storms that increase erosion rates within the stream channel and smother aquatic life. In contrast, most of the rainwater soaks into the ground if it hits forest or farm land.

Surveys consistently show that stream habitats in developed areas are in a poorer condition, and support less aquatic life, than in any other land use.

The recently completed assessment stems from the Chesapeake 2000 agreement, which warned that impacts from the additional 3 million people expected in the watershed by 2020—on top of the more than 15 million already here—“could potentially eclipse the nutrient reduction and habitat protection gains of the past.” The agreement called for permanently protecting 20 percent of the watershed’s land by 2010, and reducing the rate of “harmful sprawl” 30 percent by 2012.

To help guide those actions, the agreement also called for evaluating the watershed’s “resource lands”—forests and farms—with an eye toward maintaining their roles in protecting water quality and critical habitats.

The intent was to create a tool that would help planners and other decision makers prioritize their zoning and land conservation actions toward areas that are both ecologically valuable and most vulnerable to development.

The analysis created a map of ecologically important sites using a system of cores, hubs and corridors—based on principles of conservation biology—that provide habitat and migration routes for the bulk of the watershed’s birds and wildlife.

Using existing land cover data, it identified unfragmented tracts of forests and wetlands called “cores” that extend at least 100 acres or more and are surrounded on all sides by a 100-meter buffer. Groups of cores in close proximity become even more valuable habitat and are called “hubs.” Hubs are connected by 1,000-foot-wide corridors that follow streams, ridges or other features that remain largely undeveloped.

Other maps identify areas especially important for maintaining water quality that need protection. These include forest and wetland areas—especially those close to streams—and flood plains, as well as areas with steep slopes or highly erodible soils.

Additional analyses identified economically important woodlands that need to be maintained to support viable forestry products, and areas with prime soils critical for agriculture. Other mapped data show the location of “cultural assets” such as historic landmarks or archaeological sites.

The good news is that a fair amount of the watershed is still in pretty good shape. About 57 percent qualifies as being a “hub.”

But that could change dramatically in the future. The Bay watershed loses about 100 acres of forest a day. A recent Bay Program analysis showed that impervious surfaces such as roads and rooftops increased by 250,000 acres from 1990 to 2000, covering 860,000 acres, or 2.1 percent of the watershed.

That could well continue. A report by the Bay Program’s Scientific and Technical Advisory Committee said the amount of developed land in the watershed could increase 60 percent by 2030 if recent trends remain unchanged.

And a recent report by the Brookings Institution predicts that between now and 2030, Maryland will add 1.15 million housing units statewide, Virginia, 1.67 million units and Pennsylvania 1.34 million.

The Resource Land Assessment offers a picture of what those statistics might look like on the ground. Its

vulnerability analysis identifies locations most likely to face development pressure. Those include forest and farm lands with gentle slopes that are close to growth “hot spots”—areas that grew rapidly from 1990 through 2000—and along existing road networks that allow for easy commutes. “Growth does tend to follow roads, however it also leapfrogs across county and state boundaries partly because of policy differences,” said Peter Claggett of the U.S. Geological Survey, who helped to design the map-based analysis for the Bay Program.

Indeed, the maps create a vivid graphic of potential development that “bleeds” out of existing developed areas, especially along interstate highways. “You can almost see that Richmond and Charlottesville are bleeding together,” Claggett said. “Richmond, Fredericksburg and Washington D.C. also appear to be bleeding together.” Highly vulnerable areas include the Interstate 81 corridor through the Shenandoah Valley’s prime farmland and along the Interstate 66 corridor, which passes through some of Virginia’s most important water-buffering forests, according to the assessment.

The green areas that line Interstate 95 on the water quality map turn red and orange in the vulnerability analysis. Along Interstate 83 between Baltimore and Harrisburg, prime farmland becomes buried in a sea of red and orange, highlighting its vulnerability to development.

To keep that picture from becoming a reality, Bay Program representatives have been taking the assessment on the road. The idea, they say, is not to prevent growth, but to plan it in a way that protects habitat hubs and corridors, prime soils and water quality.

“We’re developing so quickly that we’re going to lose ground if we don’t get ahead of the curve and start planning to keep what we have,” Bisland said.

Later this year, the Bay Program is planning to host workshops to introduce more planners to the assessment.

Many recent presentations have been aimed at land trusts, which see it as a potential tool for prioritizing land purchases and conservation easements. “Land trusts and land conservation organizations have not always put their actions in the context of what it means to the Bay,” said John Wolf of the National Park Service, who helped to develop the assessment. “So it has helped to engage a network that hasn’t traditionally been a major part of the Bay community.”

Already, Virginia officials are using parts of the assessment in conjunction with state-specific information to identify the lands most important for protecting water quality. Maryland is using it to identify important forests for management. Some nonprofit groups—such as Marcucci’s, which covers an eight-county area with 318 local governments—have expressed interest in its use to promote regional land use planning.

The local data in the assessment are generally not as good as what is available within a county planning department. But, Marcucci said, it offers a regional view—and one that crosses state borders—which is often lacking.

“The county planners are good at looking at what is going on inside their borders, but there is really no mechanism that enables us to look more regionally, and even more importantly, within the context of the larger Baywide region,” he said.

As a result, local planning can help protect local farms, forests and waterways. But if the impact is merely to push development into the next jurisdiction, there is little net benefit from a Bay perspective.

“This is a story about landscapes, and the Resource Lands Assessment is really valuable in showing that,” Marcucci said. “We can say, ‘Listen, this is the picture. See all these red spots here? You are going to have to deal with that one way or another.’”

For information about the Resource Land Assessment, visit [www.chesapeakebay.net/rla.htm](http://www.chesapeakebay.net/rla.htm)

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