



[HOME](#) [BACK ISSUES](#) [BAY JOURNAL RADIO](#) [SUBSCRIBE](#) [CONTACT US](#) [ABOUT US](#)

[SEARCH](#)

[Home](#) > [July/August 2004](#) > It's a hard road ahead for meeting new sprawl goal

It's a hard road ahead for meeting new sprawl goal

States will try to control growth of impervious

By Karl Blankenship

The Chesapeake drainage, it appears, is suffering from a hardening of the watershed.

The sign of the malady is a rapidly increasing amount of impervious surfaces—solid areas such as roads and rooftops which prevent rain from soaking into the ground and instead quickly shunt it, along with any accumulated pollutants, into nearby streams.

According to new figures from the Bay Program, the amount of impervious surfaces in the watershed increased by nearly 250,000 acres between 1990 and 2000, an area more than five times the size of the District of Columbia.

The Bay Program has adopted impervious surfaces as its new measurement of "harmful sprawl," which the states pledged to slow by 30 percent when signing the Chesapeake 2000 agreement four years ago.

Until now, though, no one has agreed exactly what harmful sprawl was, or how much of it was in the watershed.

After abandoning several techniques, officials agreed to use the amount of rooftops, pavement and other solid surfaces—as measured through satellite images—as a proxy to measure the rate of sprawl.

The recently compiled figures show that impervious surfaces increased from 611,017 acres in 1990 to 860,004 acres in 2000, an increase of 248,987 acres, or more than 40 percent.

Put another way, that's like blanketing an area more than twice the size of Shenandoah National Park with blacktop and shingles.

Impervious surfaces cover 2.1 percent of the watershed, compared with 1.5 percent nationwide. But the watershed's hard surfaces tend to be concentrated near the Bay, while outer portions of the watershed are still dominated by farms and forests.

Nonetheless, the data show that the headwater states, which are not bound to the sprawl goal, had the most rapid rates of development. Imperviousness increased by 61.7 percent in New York's portion of the watershed, by 137.4 percent in West Virginia, and by 170 percent in Delaware.

Among the Bay jurisdictions that are signatories to the Chesapeake 2000 agreement, the data show development occurring more rapidly in Virginia (44.7 percent increase in imperviousness) and Pennsylvania (43.7 percent increase) than in Maryland (29.8 percent increase). Imperviousness increased by only 4 percent in the heavily developed District of Columbia.

What's true in the Bay watershed is true nationwide. A recent mapping exercise by the National Oceanic and Atmospheric Administration found that in 2000, hard surfaces covered 43,480 square miles in the lower 48

Font Size: A | A | A

Tools:

PRINT VERSION

MAIL TO A FRIEND

SEND COMMENTS

Images:

(Click thumbnails for full-size image)



See Also:

- [Debate rages over new rules for TMDLs](#)
- [Most streams, many wetlands could lose protection](#)
- [Suits seek cleanup plans for waterways](#)

states, an area equivalent to the state of Ohio.

In fact, the study published in the journal *Eos* that showed impervious surfaces nationwide cover 5,500 more square miles than do all wetlands in the United States.

The research team that conducted the study noted that more than 10,000 miles of new roads and 1 million single family homes are expected nationwide in the next decade. "Given these trends, [impervious surface area] is likely to become a more prominent environmental and growth management issue in the coming years," the research team said.

When the Chesapeake 2000 agreement was signed, the Bay Program was initially praised for taking the nation's first regional approach to combating sprawl. But setting—much less achieving—the harmful sprawl goal has been a challenge for the Bay Program.

The original agreement called for reducing the rate of harmful sprawl 30 percent by 2012 from a baseline rate measured between 1992 and 1997. Those dates were selected because they coincided with the five-year release dates for the U.S. Department of Agriculture's National Resources Inventory.

But some objected to the use of NRI data, saying that its sampling design was not adequate for describing the rate of development within sub-areas of the Bay watershed and questioned the accuracy of the NRI-derived rates of development.

Further, officials from the states could not agree on what constituted harmful—as opposed to non-harmful—sprawl. Some argued, for instance, that well-planned new developments with modern stormwater drainage that minimizes runoff should not be considered harmful, but officials finally determined tracking such developments would be impossible.

After more debate, state officials agreed to define harmful sprawl as the conversion of farmland and forest to developed lands. But no method existed to reliably measure such conversions.

Finally, they settled on the measurement of impervious cover and agreed to use figures derived from Landsat satellite images taken in 1990 and 2000 as a baseline for measuring the rate of increase.

Exactly when the goal must be achieved remains unresolved, said Carin Bisland, associate director for ecosystem management with the EPA's Bay Program Office. The original Chesapeake 2000 agreement called for reaching the goal by 2012, which coincided with the release of NRI data.

The Bay Program is considering the purchase of satellite data, which is primarily used to develop computer models of watershed land uses, every five years. That means the impervious surface goal would need to be measured with 2005 or 2010 images, she said, but no decision has been made.

"What is more important than the passive measurement of impervious cover is the more active ability to use this data in combination with other indicators as a screening tool to locate areas that are the most vulnerable to development pressures," Bisland said. "With this type of screening tool, we can more actively focus our resources to assist with planning in the areas that are most at risk."

If development were to continue at the rate of the past decade through 2010, the watershed would have 1.1 million acres of impervious surfaces, said Peter Claggett of the U.S. Geological Survey, who analyzed impervious surface data. Reducing the 1990–2000 rate by 30 percent, he said, would result in a 75,000-acre reduction in the amount of impervious surface projected for 2010.

Claggett cautioned that making exact comparisons between years can be difficult because the quality of 2000 satellite images is generally better than the quality of the 1990 images, making it more likely that more impervious surfaces would be identified.

Nonetheless, he said, just looking at impervious surfaces undercounts the full extent of development. The analysis probably underestimates the amount of impervious surfaces in rural areas.

"It's also going to miss places where the tree cover hides impervious surfaces under the canopy," Claggett said.

Those low-density areas may have less of an impact on water quality than high density development, but cause other problems, such as fragmentation of habitat for birds and wildlife. "If you're looking at sprawl, those areas are important," Claggett said.

Development, and impervious surfaces in particular, are considered a major water quality threat because—unless areas are using state-of-the-art runoff controls—they tend to rapidly shunt rainwater into streams.

That rain picks up large amounts of nutrients and toxic pollutants—everything from animal wastes to oil and grease from carts to contaminants falling from air pollution—as it runs off the land.

The sudden surge of water in urban waterways after storms dramatically alters stream hydrology, increasing erosion rates within the channel and smothering aquatic life. By contrast, most of the rainwater soaks into the ground if it hits forest or farm land.

As a result, surveys consistently show that stream habitats in developed areas are in a poorer condition than in any other land use.

In small watersheds, studies by the Maryland Department of Natural Resources Biological Stream Survey have shown that some sensitive species are affected by even low amounts of impervious cover.

For instance, the survey never found brook trout in any stream whose watershed had more than 2 percent impervious cover. In fact, the study found brook trout were rare in any watershed with more than 0.5 percent impervious cover. For reference, 0.5 percent would be equivalent to a two-lane road going through a square mile of land. A recent study in Montgomery County, MD, shows that overall stream health becomes degraded at impervious levels around 6 percent.

Studies by the nonprofit Center for Watershed Protection conclude it is "extremely difficult to maintain predevelopment stream quality when watershed development exceeds 10–15 percent impervious cover." That translates into about one house per every one to two acres, when roofs, roads and driveways are all factored in.

While impacts of impervious surfaces can be reduced through new low-impact development techniques, which emphasize stormwater controls and promote infiltration into the ground rather than runoff into streams, such techniques are not widely used in most areas.

Karl is the Editor of the Bay Journal.

Read [more articles by this author](#).

Have a comment on this article? [Send it](#) to the Editor

Tools: [↑ TOP OF PAGE](#)

[PRINT VERSION](#)

[MAIL TO A FRIEND](#)

[HOME](#) | [BACK ISSUES](#) | [BAY JOURNAL RADIO](#) | [SUBSCRIBE](#) | [CONTACT US](#) | [ABOUT US](#)

The Bay Journal is published by the Alliance for the Chesapeake Bay for the Chesapeake Bay Program.

[Terms of Use](#) | [Privacy Policy](#) | [RSS Feeds](#) | © Copyright 2007 - Bay Journal