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## **Flooding is caused by more than just rainfall**

**By Dave Strayer**

*For the Poughkeepsie Journal*

Last week, heavy rainfall and wet soils combined to create floods throughout the mid-Hudson Valley. Standing water closed more than 60 roads, including parts of the Taconic Parkway.

According to the United States Geological Survey, it was the third-largest flood on Wappinger Creek since 1928, and the fifth-largest on the Ten Mile River since 1930.

At its peak, Wappinger Creek had risen 13 feet above typical summer levels, and was carrying 87,000 gallons of water over the dam at Red Oaks Mill every second. We can expect to see a flood this size every 15-30 years.

What determines the size of a flood? To begin with, the harder it rains, the bigger the flood. However, peak flows last week were almost twice as large as in the flood of October 2005, even though we had much less rain (5.2 inches in two days) than in October 2005 (8 inches in a day, and 13 inches in a week). Rainfall alone doesn't determine the size of a flood.

Several other factors contribute to flood severity. Actively growing plants take up about half the rainfall in a typical summer. As a result, it takes more rain to cause a flood in summer than in winter or spring.

The weather leading up to a storm can also affect flooding. Lack of growing vegetation and wet ground from earlier rain and snow added to the severity of last week's flood.

### **The human factor**

Human activities also contribute to flooding. Impervious surfaces such as parking lots, roadways and roofs cause water to run rapidly into streams. Careless construction or land management can cause excess sediment to enter streams, filling up stream beds and making them more prone to flooding.

As was apparent to anyone out driving in last week's flood, artificial barriers to water flow (inadequate culverts, roadways) can cause local flooding.

It is normal for streams to flood. Streams mold their channels to carry the water and sediments they receive from the landscape. A typical stream in our region has a floodplain that contains water periodically during wet periods. Streamside plants benefit from the rich soils deposited by floodwaters. Fish and other animals that use floodplains for feeding or breeding also depend on this regular cycle of flooding.

Preventing streams from rising into their floodplains can cause ecological damage and increase flood severity downstream.

Floodplains and wetlands help ensure against severe floods. By absorbing and slowly releasing water, these areas allow floodwaters to work their way downstream gradually, instead of arriving in a single, devastating pulse.

Economic damages from flooding can be reduced if homes and businesses are kept away from floodplains and stream banks. Uses such as hiking trails, pastures or recreational fields may be appropriate for floodplains, as long as we recognize they will occasionally flood.

Although it might seem logical to head off floods by dredging, straightening stream channels or building levees, such projects can actually worsen the problem.

By preventing water from spreading out onto the floodplain and speeding the movement of water downstream, these projects can exacerbate downstream flooding - helping you but hurting your neighbors. These projects can also destabilize stream channels, causing erosion, sediment problems and ecological damage for years. Problems are not limited to the project area, but can extend for long distances up and downstream.

Preventing flood damage requires management of entire watersheds, not just stream channels. Dutchess County is fortunate to already have management plans for Wappinger and Fishkill Creeks, which could serve as the basis for such planning.

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