



Managing the Watershed to Prevent Flooding

During rainstorms, water can soak into the ground or can rush off the landscape into lakes, rivers and streams. Ideally stormwater soaks into the ground where it is held on the land or is held in wetlands where it is slowly released into water bodies. Large amounts of stormwater rushing off the land and into water bodies can lead to flooding. Furthermore rushing stormwater can flush pollutants and fertilizers off the land and into a water body leading to deterioration of water quality in the receiving lake or stream.

The solution to flooding is to look at the entire watershed – the land area that drains into the water body. To successfully prevent flooding, three components that contribute to flooding must be addressed:

- land use policies, including building and filling flood plains and restoring wetlands
- farm drainage policies (including buffer strips on streams, grass waterways), and
- urban stormwater policies.

Land use policies

- Restore wetlands so that they will hold water after a storm and slowly release the water. Wetlands can store tremendous amounts of water, thus helping to avoid flooding.
- Reduce wetland destruction. Do not fill and do not build on wetlands.
 - Prohibit building in 100-year and 500-year flood plains. Building on and filling in a floodplain diverts the water to other properties upstream and downstream. Repeated construction and destruction of wetlands done over significant areas in a floodplain can suddenly find a landowner's property in the floodplain for the first time.
 - Retreat from the low-lying areas after buildings are flood-damaged and leave the floodplains as green space. As structures are destroyed in floods, funds should be used to remove both the structure and the fill that was brought into the floodplain.
 - Update flood plain maps following each flood event. This is especially necessary given the amount of fill that has been placed in the floodplain of some of Iowa's rivers and the extensive destruction of wetlands that has occurred over the years.
- Discourage destruction of prairies and woodlands that store large quantities of water.
- Avoid building expensive floodwalls and levees; they are not recommended.



*Restored wetland in Van Buren County, Iowa.
Photo credit: Lynn Betts, USDA NRCS*

Farm drainage policies

- Build grass waterways on fields and maintain stream buffers allowing water to absorb and flow in a less damaging manner.
- Plant prairie plants in ditches to keep water on the land and to hold contaminants from fields, roads and highways.
- Develop standards and guidelines that reduce the effects of stover loss. Stover is the residue left on fields after the grain is harvested, including stalks, leaves and roots. It includes corn stalks, corn cobs and the remains of soybean plants. Crop residues are beneficial for water retention in the soil.
- Use of cover crops. The cover crops such as tillage radish are planted in the fall and can hold soil and water on the land over the winter.
- Increase the amount of organic material in the soil to absorb and retain moisture.
- Implement rotational grazing which keeps plants thriving in the pastures and thus retains water on the land.

Urban stormwater policies and techniques

Local governments can make policies that affect their publicly owned property, detention and retentions basins and zoning. In fact, Iowa City has an ordinance that protects sensitive areas, such as slopes, prairies and forested regions. The ordinance allows modifications for builders in order to protect those areas.

- Encourage residents, businesses and local governments to plant swales around parking lots, develop rain gardens, use rain barrels and cisterns, install green roofs and plant trees and prairie plants.
- Ensure adequate detention basins are built in urban areas, to collect runoff and retain it rather than allowing stormwater to rush into water bodies.
- Encourage the installation of permeable pavement on parking areas to allow water to be captured and released slowly after storms and thawing.
- Ensure that the sewage treatment plants in Iowa have adequate capacity so that they do not overflow due to heavy rains, a situation known as a by-pass.

Conclusion

Working together, these policies and techniques can contribute to less flooding and cleaner streams and lakes. Although there is a cost to implement these policies, flooding results in losses to income and property, expensive repairs and costly clean-up.



Bear Creek in Story County, Iowa, buffered by grass and trees. Photo credit: Lynn Betts, USDA NRCS



Cedar River flood near Highway 30. Photo credit: Pam Mackey-Taylor