The use of zoning to protect water quality represents the “second generation” of water quality regulation in the United States. The original regulatory thrust was the reduction of “point source” pollution, such as direct discharges from factories and sewage treatment plants into waterways. These discharges were responsible for the appalling condition of most American rivers and lakes in the first half of the 20th Century.

As the Clean Water Act brought point source discharges under control in the 1970s and ’80s, the worst pollution was cleaned up. Attention has increasingly turned to the problem of “non-point source” pollution, primarily stormwater run-off from surfaces such as roofs, parking lots, roads, farm fields, and lawns. See page 14.

Regulating land use practices near streams can significantly reduce the run-off of sediment and other pollutants into water bodies. But conventional zoning, which divides a jurisdiction into zoning districts and establishes use and dimensional regulations for each district, can actually contribute to the problem of non-point pollution by ignoring the impacts of nearby development. For example, if a lot has a stream running through the rear yard, a large minimum front setback (required under the zoning district regulations) might force a building to be located very close to that stream, resulting in possible degradation to its water quality.

By creating a system of “overlay zones” that cross conventional zoning district boundaries and protect stream corridors, lakeshores, and watersheds, it is possible to maintain and improve the water quality – even as the community becomes more developed.

A water protection overlay zone is a special kind of zoning district designed to protect a stream corridor, lake, or watershed. It “overlays” existing zoning districts and adds additional requirements to the underlying district zoning, which remains in effect except to the extent the overlay zone provisions specifically modify it.

An overlay zone protects water quality by setting additional standards for development and by incorporating site-specific review procedures.

DEVELOPING AN OVERLAY ZONE

1. Boundaries

An essential first step in developing an overlay zone is to map the zone’s boundaries. In the case of stream corridors or lakeshores, these boundaries are typically determined by drawing a boundary line a specified horizontal distance from the bank or shore of the stream or lake (usually between 100 and 200 feet).

In the case of the watershed of a lake or reservoir, an overlay zone boundary is usually the actual physical boundary of the watershed. Establishing the location of such a boundary requires study of topographic maps. A field investigation by an engineer or a hydrologist may be needed to establish an exact boundary location for specific sites.

Note that delineating an overlay zone boundary is not the same thing as establishing a setback or buffer (which will be discussed shortly). While this can be a confusing distinction, the difference is simply that the overlay zone is the broader geographic area within which standards such as setbacks and buffers apply.

2. Standards

The purpose of development standards used in overlay zones is to reduce or mitigate adverse impacts that development might otherwise have on the water body. Among the most common standards:

- Limitations on impervious surface coverage. One of the main factors affecting water quality is the total percentage of land covered with impervious surfaces such as buildings, pavement, and highly compacted soil. Overlay zones may set a lower level of impervious surface coverage than would otherwise be allowed in the underlying zoning district. For example, an overlay zone might provide for a maximum of 10 percent impervious coverage, compared to 40 percent in the underlying zoning district (if that district regulates impervious surface coverage at all). Again, the overlay district’s stricter limits would control.

- Setbacks. Setbacks establish a required minimum distance between buildings and the stream or lakeshore. Setbacks

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1 Stream corridors, in addition to protecting water quality, can offer other benefits such as minimizing property damage from floods, preserving wildlife corridors, and providing areas for hiking and bicycle trails.

2 Overlay zoning is a technique used in a variety of ways, not just for protection of natural resources such as lakes and streams. For example, overlay zones can be designed to better protect historic structures or improve roadway corridors. For an overview of overlay zoning, see “Making Use of Overlay Zones,” by Elizabeth A. Garvin, Esq., in PCJ #43 (Summer 2001).

3 Once the area of an entire watershed has over 10 percent impervious surface coverage, water quality begins to decline. It is possible to have higher percentages of impervious surface coverage if measures are taken to filter the stormwater, but in relatively undeveloped areas maintaining a low impervious surface coverage ratio is the most effective tool.
The protection of water quality requires attention not only to surface water bodies (the focus of this article), but also to wetlands and groundwater.

Wetlands Protection. The importance of wetlands has been recognized since the 1970s when Congress and most state legislatures passed laws to protect them. Federal wetland protections are administered through the Army Corps of Engineers under Section 404 of the Clean Water Act. For larger projects, this can require obtaining a permit from the Corps. Smaller projects falling below designated thresholds typically do not require an individual permit. State level regulation of wetlands varies greatly. Some states regulate wetlands through state agencies, while others delegate this function to local governments.

Aquifer (Groundwater) Protection. In communities that rely on an aquifer for potable water, it is essential to protect the groundwater from contamination. Overlay zones identify the surface area that can affect underground water within the aquifer. With the exception of “sole-source aquifers,” which enjoy federal and state protection, aquifer protection is primarily a matter of local regulation, usually through overlay zoning. Unlike wetlands and surface waters, which can be studied by direct inspection, groundwater is not visible. Aquifer studies therefore require inferences based upon the results of well tests, mapping of surface watersheds, and studies of soils and geology.

Watershed overlays typically incorporate stream corridor overlays, but also contain regulations that affect the entire watershed. These often include limitations on: impervious surface coverage; clear-cutting of trees; and large-scale land disturbance such as excavation, grading, and construction. Such overlay zones may also require low density zoning throughout the watershed; mandatory clustering of development; and the use of public sewer infrastructure to minimize septic discharges.

Watershed overlays designed to protect public drinking water supplies will...
Overlay Zoning to Protect Surface Water

likely contain more stringent standards. The construction of water and sewer infrastructure within public water supply watersheds can be controversial. While sewer systems are generally better for water quality than septic systems, some communities’ watershed overlay regulations ban sewers. The reasoning is that having sewers will lead to higher density development which, in turn, will generate more run-off. However, this outcome can be avoided if the underlying zoning sets a low overall density, while requiring clustered development that protects surface waters with large open space buffers.

3. Review Procedures

While some overlay zone standards, such as setbacks, are relatively straightforward to administer, other standards may necessitate a site-specific review and analysis. In many communities, the existing zoning ordinance will already require subdivision or site plan review for large-scale residential developments and most kinds of commercial development. In such instances, consideration of the overlay zone standards can be incorporated into the existing review process.

However, smaller-scale development, such as building a house on an existing lot, will typically require only a building permit. If overlay zoning standards are adopted, it may be necessary...
to include provision for a streamlined form of site plan review for small projects. This can be administered by a municipal board or commission (such as the planning commission), or by a zoning administrator or building inspector. Some activities regulated within the overlay zone (such as clearing of vegetation or the use of fertilizer) will not normally require any special review. Violations brought to the attention of the zoning administrator or building inspector will typically result in fines and/or corrective measures.

**Non-Zoning Approaches**

It is worth noting that there are a number of non-zoning approaches that can also be important to achieving a community’s water quality protection objectives. These include:

- **Public education.** To deal with those practices that are especially hard to regulate, such as the use of pesticides, herbicides, and hazardous substances near waterways, public education campaigns by municipalities and watershed associations have often been effective.

- **State river and lake protection legislation.** Many states have adopted river and lake protection programs that function in much the same way as overlay zones, requiring setbacks, buffers, and regulated areas near water bodies.

- **Installation of water protection infrastructure.** This may include upgrading existing sewage treatment plants, building new plants, and providing subsidies to upgrade individual septic systems.

- **Water supply watershed protection regulations.** In many states, providers of public water have regulatory powers outside of their jurisdictional boundaries to protect water quality in their reservoirs. For example, New York City is able to regulate land uses within the watersheds of its reservoirs in the Catskill Mountains under authority given to it through the state health department.

- **Acquisition of riparian and watershed land.** The acquisition of land by public agencies or non-profit land trusts for conservation purposes is perhaps the surest way to ensure water quality protection. However, land acquisition can be quite costly.

- **Wetlands regulation.** The regulation of wetlands at the federal, state, and local level has done a great deal to protect water quality and will continue to do so.

- **Development patterns.** The importance of the overall pattern of development in a community should not be ignored. Development that takes a “smart growth” or “new urbanist” form can result in much lower impervious surface coverage and greater setbacks from waterways. This enables the community to protect its water resources by virtue of its overall development pattern, rather than just by site-specific regulations.

**SUMMING UP:**

Overlay zones can be a highly effective tool in local efforts to protect water quality. Used in combination with other planning and zoning tools, overlay zones can preserve and maintain a natural resource that is vital to health, quality of life, and economic well-being.

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Minnesotans love their lakes. This is proven by the fact that the only state-wide zoning requirement in Minnesota is that communities must adopt shoreland management overlay districts for lakes and rivers. In response to water quality concerns, the Legislature enacted (in 1970) the Minnesota Shoreland Management Act. At least 250 local governments have adopted shoreland ordinances, including 85 of the state’s 87 counties.

Based on a lake and river classification system, local ordinances are required to contain minimum standards and best management practices for shoreland development that include: minimum lot sizes and width at shoreline; restrictions on types of uses; structure and septic setbacks from shorelines and bluffs; limits on impervious surfaces; stormwater management requirements; and restrictions on the removal of vegetation to minimize runoff and minimize visual impacts of development for lake users. Many local ordinances include provisions that exceed the minimum requirements.

The Minnesota Department of Natural Resources and the Minnesota Erosion Control Association promote education for local officials on the connection between land use and water quality through Northland NEMO (Non-point Education for Municipal Officials); <www.mnerosion.org/nemo.html>.

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