

## Receiving Waters

Selection of stormwater BMPs should consider the type and sensitivity of the downstream receiving waters. All stormwater BMPs should be selected and designed with consideration of stormwater pollutants of concern for the receiving waterbody, such as pollutants associated with a known water quality impairment or Total Maximum Daily Load (TMDL). [Table 8-7](#) summarizes the suitability of stormwater BMPs based on some of the several common types of receiving waters and associated pollutants of concern:

- Coldwater streams (thermal/temperature)
- Freshwater lakes and ponds (phosphorus and sediment)
- Coastal waters and estuaries (nitrogen and bacteria)

Note that this is just a summary of some of the common types of receiving waters and the associated pollutant types (for example bacteria can often be associated with freshwater lakes and ponds too).

### Coldwater Streams

Coldwater streams are areas or reaches of streams with water cold enough throughout the year to support coldwater fish species. Coldwater streams, including Class B streams or managed stocked streams, can be adversely impacted by stormwater runoff with elevated temperatures. In addition, the rate and volume of stormwater discharges from new developments are especially critical to these systems, as they could impact the flood carrying capacity of the watercourse and increase the potential for channel erosion.

Infiltration BMPs and Filtering BMPs are recommended for sites that discharge to or are located within the drainage areas of coldwater streams. Stormwater BMPs that provide treatment by infiltration and filtration can moderate runoff temperatures by thermal exchange with cooler subsurface materials. Stormwater BMPs with large permanent pools that are exposed to direct sunlight such as Stormwater Pond and Wetland BMPs can discharge stormwater with increased temperatures and should not be used for sites that discharge within 200 feet of coldwater streams.

### Freshwater Lakes and Ponds

Lakes and ponds are especially sensitive to sediment and nutrient loadings. Excess sediments and nutrients are the cause of algal blooms in these surface waters, leading to eutrophication and degradation. These conditions often result in costly dredging and rehabilitation projects. In freshwater systems, phosphorus is typically the limiting nutrient, that is, much less phosphorus is needed compared to other nutrients such as nitrogen to create eutrophic conditions. As a result, stormwater BMPs should focus on phosphorus removal for stormwater discharges to lakes and ponds and watercourses that feed lakes and ponds. Infiltration BMPs and Filtering BMPs are generally most effective for removing phosphorus.

### Coastal Waters and Estuaries

Coastal and estuarine waters are more sensitive to nitrogen loadings than freshwater systems. In saltwater systems, nitrogen tends to be the limiting nutrient as opposed to phosphorus. Excess loading of nitrogen is a major source of water quality impairments in Connecticut's coastal embayments and Long Island Sound. Bacteria are also a concern given the sensitivity of public swimming areas and shellfish beds to bacterial loadings and the many bacteria-impaired waters along Connecticut's highly urbanized coastline.

Stormwater BMPs that incorporate vegetative uptake and microbial nitrogen removal in an anaerobic subsurface zone (anoxic conditions) such as Stormwater Pond and Wetland BMPs (e.g., subsurface gravel wetlands) are generally more effective for nitrogen removal, while Infiltration and Filtering BMPs are generally more effective for reducing bacteria loads. Bioretention systems can also be designed with a submerged Internal Water Storage zone within the lower gravel storage reservoir for enhanced nitrogen removal.

Stormwater BMPs that rely on adequate vertical separation distance to groundwater (e.g., infiltration systems) are also more vulnerable to rising groundwater levels when located in coastal areas that are predicted to experience substantial sea level rise.