

Ohio's Coastal Design Manual

The Ohio Coastal Program helps communities design resilient and effective shoreline protection structures through high-quality coastal data, published guidance, and site visits.



Bluff erosion destroys a car in Lake County, Ohio.

The shoreline of Lake Erie is constantly shifting. On a stormy day, strong waves carve away the base of steep clay bluffs. Erosion weakens the bluffs over time, causing the land above to become unstable and collapse into the lake. Collapses occur quickly and without warning, severely damaging homes and property. In Lake County, Ohio, coastal bluffs can recede as much as 12 feet annually. This isn't a rare problem—there are thousands of homes on the Lake Erie waterfront, and nearly half are within 50 feet of the edge of a bluff. Many of them are much closer. And, this hazard affects more than lakefront homeowners. Public parks, boat launches, fishing areas, utilities, and critical infrastructure owned by the State of Ohio also suffer the damage and resulting costs of coastal erosion. All taxpayers bear the burden of reduced property tax revenue and increased insurance costs, even those who don't live on the coast. The economic

losses caused by coastal erosion can exceed tens of millions of dollars each year.

To help coastal communities become more resilient to erosion, the Ohio Coastal Management Program (OCMP) developed a Coastal Design Manual in 2011. The manual demonstrates the best design principles for shoreline protection structures along Lake Erie. OCMP created the manual to guide local planners toward a balance between erosion control, public access to the water, and the need to protect and maintain Lake Erie's natural resources. The manual is also valuable to engineers and contractors, who will find resources for planning shoreline protection projects and working with landowners. Landowners themselves can use the manual to gain a better understanding of the design, surveying, and construction process. Overall, the manual establishes a clear standard for evaluating projects based on their stability, effectiveness, and impact to the coastal environment.

OCMP developed a second edition of the Design Manual in 2014, focused on natural shoreline features such as dunes and beaches. These features provide erosion control as well as coastal habitat and water quality benefits. With that in mind, the manual's second edition includes innovative resources for beach nourishment, maintenance of coastal dune systems, and wetland restoration projects. Hundreds of copies of the manual have been distributed to coastal landowners, local governments, contractors, engineering firms, landscape architects, and other stakeholders.

In addition to the manual, OCMP produced a set of tools to help coastal communities manage their sand resources—a crucial component of reducing erosion risks. The tools identify natural sources of sediment, estimate sediment transport rates, and assess the long-term impacts of shoreline construction on natural sediment processes. OCMP staff use these tools to directly assist local shoreline protection efforts at all levels, from county planning agencies to individual municipalities and private landowners. OCMP's coastal engineers also conduct site visits and evaluations at no cost, saving communities a considerable amount of time and money. OCMP staff have completed nearly 200 of these site visits since the Design Manual was published, providing expert advice on design options and reviewing project plans.