

## Resources for Minnesota’s Coastal Property Owners

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The Minnesota Department of Natural Resources (DNR) is providing this list of select resources and tools for coastal property owners. These resources cover a broad range of topics relating to coastal hazards, reducing risks, and important considerations unique to coastal properties. Please note that many of these resources are not specific to Minnesota’s shoreline. Inclusion in this list is not any endorsement. This list will be updated as more resources become available.

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## Coastal Hazards and Preparedness

### Erosion

[A Guide to Coastal Erosion Processes](http://seagrant.sunysb.edu) (seagrant.sunysb.edu)

Author(s): Charles O’Neill Jr., New York Sea Grant; 1985

Provides a good overview of the natural drivers of erosion.

[Living on the Coast](http://publications.aqua.wisc.edu) (publications.aqua.wisc.edu)

Author(s): US Army Corps of Engineers (USACE) & University of Wisconsin Sea Grant Institute; 2003

Overview of natural shoreline processes ranging from storm surges to erosion.

### Disaster Preparedness

[Ready](http://ready.gov) (ready.gov)

Author(s): Federal Emergency Management Agency (FEMA)

National resources for disaster preparedness and response.

[Ready North](http://readynorth.org) (readynorth.org)

Author(s): Ready North

Local guidance and resources for preparing and responding to natural disasters.

### Flooding

[Flood Factor](http://floodfactor.com) (floodfactor.com)

Author(s): First Street Foundation

Online tool to identify existing flood risk for your home and projections of future flood risk.

[Flood Forecasts](http://water.weather.gov) (water.weather.gov)

Author(s): National Weather Service (NWS)

Flood forecasts from the NWS-Duluth Office for Northeastern MN and Northwestern WI.

[Flood Map Service Center](http://msc.fema.gov) (msc.fema.gov)

Author(s): FEMA

Interactive online viewer to search for flood maps based on location. Provides access to digital flood maps where available.

[Flood Preparation, Response, & Recovery](http://mndnr.gov/floodplain) (mndnr.gov/floodplain)

Author(s): DNR

Resources and guidance from the DNR on preparing for and responding to flooding at your home.

[National Flood Insurance Program](http://floodsmart.gov) (floodsmart.gov)

Author(s): FEMA

Information about flood insurance for homeowners, businesses, and renters.

## Lake Superior Water Levels

[Lake Level Viewer](http://coast.noaa.gov/llv) (coast.noaa.gov/llv)

Author(s): National Oceanic and Atmospheric Administration (NOAA)

Interactive map viewer that shows how changes in lake level across the Great Lakes might potentially impact the shoreline. You can raise or drop lake levels by up to 6 feet and understand potential impacts on your shore.

[Great Lakes High Water](http://lre.usace.army.mil/About/Great-Lakes-High-Water/) (lre.usace.army.mil/About/Great-Lakes-High-Water/)

Author(s): USACE

US Army Corps of Engineers webpage with all of its resources relating to high water levels on the Great Lakes.

[The Great Lakes Dashboard](http://glerl.noaa.gov) (glerl.noaa.gov)

Author(s): NOAA & USACE

Viewer that shows monthly averages of water levels in all of the Great Lakes.

## Reducing Your Coastal Hazard Risks

### Adapting to Coastal Hazards

[Adapting to a Changing Coast](http://publications.aqua.wisc.edu) (publications.aqua.wisc.edu)

Author(s): Wisconsin Sea Grant; 2017

Guide for different strategies that home owners can take to adapt to coastal shoreline changes and hazards.

[Great Lakes Coastal Resilience Planning Guide](http://greatlakesresilience.org) (greatlakesresilience.org)

Author(s): NOAA

Examples and guidance on coastal resiliency in the Great Lakes.

### Natural Shorelines and Vegetation Buffers

[Living Shorelines Academy](http://livingshorelinesacademy.org) (livingshorelinesacademy.org)

Author(s): EPA, North Carolina Coastal Federation, Restore America's Estuaries

Guidance for homeowners on designing and implementing a living shoreline.

[Minnesota Shoreland Management Resource Guide](http://shorelandmanagement.org) (shorelandmanagement.org)

Author(s): Minnesota Sea Grant

Interactive quick guide on managing shorelines and best management practices.

[Natural Infrastructure](https://coast.noaa.gov/digitalcoast/topics/) (coast.noaa.gov/digitalcoast/topics/)

Author(s): NOAA Digital Coast

Resources and tools on natural or nature-based infrastructure for coastal projects.

[Restore Your Shore](https://mndnr.gov/rys) (mndnr.gov/rys)

Author(s): DNR

Online tool that provides information and resources on shoreland restoration and projects.

[Shoreline Alterations: Natural Buffers and Lakescaping](https://mndnr.gov/publications/waters) (mndnr.gov/publications/waters)

Author(s): DNR; 2012

Explains the importance of vegetation buffers and the concept of lakescaping.

[Shoreland Properties](https://extension.umn.edu/lakes-and-wetlands/shoreland-properties) (extension.umn.edu/lakes-and-wetlands/shoreland-properties)

Author(s): University of Minnesota Extension

Guide with videos explaining best management practices for shoreland properties.

[Vegetative Best Management Practices: A Manual for Pennsylvania/Lake Erie Bluff Landowners](https://seagrant.psu.edu)

(seagrant.psu.edu)

Author(s): Pennsylvania Department of Environmental Protection; 2017

Although not all of the plants and legal considerations are relevant to Minnesota, this is an excellent handout for understanding how to protect bluff shorelines.

## **Water Runoff and Stormwater**

[Controlling Coastal Bluff Groundwater](https://seagrant.sunysb.edu) (seagrant.sunysb.edu)

Author(s): New York Sea Grant

Discusses strategies for addressing groundwater seepage in coastal bluffs.

[Lake Superior Homes and Gardens](https://lakesuperiorstreams.org) (lakesuperiorstreams.org)

Author(s): Lake Superior Streams

Guidance for coastal homeowners on managing stormwater and preventing water pollution at their home.

## **Protecting Your Shoreline**

### **Permits & Regulations Related to Coastal Properties**

[DNR Public Waters Permits](https://mndnr.gov/permits/water) (mndnr.gov/permits/water)

Author(s): DNR

DNR Public Waters permitting program is responsible for activities in Minnesota's shorelands.

[Shoreland Management Program](https://mndnr.gov/waters/watermgmt_section/shoreland) (mndnr.gov/waters/watermgmt\_section/shoreland)

Author(s): DNR

Information for Minnesota shoreland property owners and shoreland regulations.

[US Army Corps Regulatory Program](http://mvp.usace.army.mil/Missions/Regulatory/) (mvp.usace.army.mil/Missions/Regulatory/)

Author(s): USACE St. Paul District

Regulatory information on permits required from the USACE.

## **Shoreline Protection and Modification**

[Engineering with Nature](http://ewn.el.erdc.dren.mil) (ewn.el.erdc.dren.mil)

Author(s): USACE

Combining coastal engineering with natural processes.

[Erosion Management for New York's Great Lakes Shorelines](http://seagrant.sunysb.edu) (seagrant.sunysb.edu)

Author(s): Roy Widrig, New York Sea Grant

Guidance on managing erosion along the Great Lakes coasts.

[Great Lakes Coastal Shore Protection Structures and Their Effects on Coastal Processes](http://publications.aqua.wisc.edu)

(publications.aqua.wisc.edu)

Author(s): WI Sea Grant

Shore protection structure impacts to coastal shorelines.

[Maintaining Shoreline Erosion Control Structures](http://seagrant.sunysb.edu) (seagrant.sunysb.edu)

Author(s): New York Sea Grant

Guidance on care and maintenance needed for effective shoreline structures.

[Systems Approach to Geomorphic Engineering](http://sagecoast.org) (sagecoast.org)

Author(s): USACE, NOAA

Overview on nature-based and living shoreline stabilization.

[Ohio Coastal Design Manual](http://coastal.ohiodnr.gov) (coastal.ohiodnr.gov)

Author(s): Ohio Department of Natural Resources Office of Coastal Management; 2014

Designs specific to Lake Erie, but is a useful manual on engineering considerations when designing shoreline protection.

[Stabilizing Coastal Slopes on the Great Lakes](http://publications.aqua.wisc.edu) (publications.aqua.wisc.edu)

Author(s): Gene Clark, University of Wisconsin Sea Grant Institute; 2012

Guidance for maintaining stable slopes on coastal bluffs and banks.

[Structural Methods for Controlling Coastal Erosion](http://seagrant.sunysb.edu) (seagrant.sunysb.edu)

Author(s): Charles O'Neill Jr., New York Sea Grant; 1986

In-depth guidance on erosion control structures.

## Working with Engineers and Contractors

[Great Lakes Coastal Engineering Firms and Contractors](http://seagrant.wisc.edu) (seagrant.wisc.edu)

Author(s): University of Wisconsin Sea Grant Institute

List of engineering and contracting firms that specialize in coastal projects in the Great Lakes.

[Guidelines for Selecting a Marine Contractor](http://seagrant.sunysb.edu) (seagrant.sunysb.edu)

Author(s): New York Sea Grant; 2015

Tips on choosing a contractor and a glossary of common coastal structure terms.

[Working with Engineers and Contractors on Shore Protection Projects](http://publications.aqua.wisc.edu) (publications.aqua.wisc.edu)

Author(s): Gene Clark, University of Wisconsin Sea Grant Institute; 2012

Guidance for homeowners on selecting and working with engineers and contractors.

## Local Resources

### Contacts for Support and Assistance

[DNR Area Hydrologists](http://mndnr.gov/permits/water) (mndnr.gov/permits/water)

[Cook County Soil & Water Conservation District](http://cookswcd.org) (cookswcd.org)

[Lake County Soil & Water Conservation District](http://lakecountyswcd.org) (lakecountyswcd.org)

[South St. Louis County Soil & Water Conservation District](http://southstlouisswcd.org) (southstlouisswcd.org)

### Online Maps and Tools

[Cook County mAPP](http://cookcountymn.maps.arcgis.com) (cookcountymn.maps.arcgis.com)

Author(s): Cook County, MN

Interactive map platform with property information for Cook County.

[Lake County Atlas](http://co.lake.mn.us/gis/) (co.lake.mn.us/gis/)

Author(s): Lake County, MN

Interactive map with aerial imagery and property information for Lake County.

[North Shore Erosion Mapping Tool](http://ardc.org/CEHM) (ardc.org/CEHM)

Author(s): ARDC, DNR, NOAA, and partners

Interactive map with shoreline and erosion data for the Minnesota's Lake Superior shoreline.

[National Wetland Index \(NWI\) Wetland Finder](http://arcgis.dnr.state.mn.us/ewr/wetlandfinder/) (arcgis.dnr.state.mn.us/ewr/wetlandfinder/)

Author(s): DNR

Interactive map for locating wetlands in the state of Minnesota.

[St. Louis County Land Explorer](https://gis.stlouiscountymn.gov/landexplorer/) (gis.stlouiscountymn.gov/landexplorer/)

Author(s): St. Louis County, MN

Interactive map platform with local property information for St. Louis County.

## **Property Owner Guides**

[The Property Owner's Resource Guide: Cook County](#)

Author(s): Cook County, Minnesota; 2013

Guide for Cook County property owners and prospective buyers.

[Shoreland Stewardship Resource Guide](#)

Author(s): Cook County Soil and Water Conservation District; 2019

Shoreland guide that highlights best management practices.