

Appendix 3 - State/Province Coastal Erosion Setback Summary

Province - Ontario

Introduction: Conservation and regulation of Ontario's shorelands is administered by Ontario's Ministry of Natural Resources (MNR) according to Ontario's Conservation Authorities Act of 1946, and implemented by regional Conservation Authorities (CAs). Jurisdictions for 26 of these authorities lie along the shores of Lakes Ontario, Erie, Huron, and Superior. Conservation Authorities manage, regulate, or acquire floodplains, hazardous shorelines and conservation lands.

Natural hazards (including coastal hazards) are declared "areas of provincial interest" in Ontario's Provincial Policy Statement (PPS) of the Planning Act. The Principles of the PPS state that the province's economic prosperity, environmental health and social well being depend in part on protecting the environment and "reducing the potential for public cost or risk to Ontario's residents by directing development away from areas where there is risk to public health or safety or of property damage." (OMNR 2001a).

MNR is the lead provincial agency with overall responsibility for natural hazard policies and programs. Municipalities are "delegated with the responsibility to identify areas subjected to natural hazards and develop management plans to limit exposure to public health and safety risks. Development in these areas should not result in an unacceptable level of risk to the residents, the community, or to other governments." (OMNR 2001a).

In the early 1990s, 38 of 74 municipalities along the Great Lakes coasts of Ontario had setback designations. These designations range from 7.6 meters (25 feet) to the one percent risk (100-year) erosion/recession line (Ecologistics. 1993).

There are three components in determining the landward reach of Ontario's erosion hazard area: stable slope allowance, average annual recession (where there is sufficient and reliable recession information), and erosion allowance (where there is insufficient or unreliable recession information).

Stable Slope Allowance. The suggested stable slope angle is about three-to-one (3:1, horizontal:vertical), or about 18 degrees. The stable slope allowance is a horizontal distance "measured landward from the toe of the shoreline cliff, bluff or bank that is three times the height of the cliff, bluff or bank. The height is the difference in elevation between the toe of the shoreline cliff, bluff or bank, which may be above the surface of the water, or below it, and the top or first lakeward break in slope."

Average Annual Recession. A value is used for a site where there is at least 35 years of reliable recession information. There is no reference to how climate change might affect that reliability.

Erosion Allowance. A setback distance suggested to allow for erosion where there is no reliable recession information.

Setback reference: Toe of bluff for stable slope allowance. A stable slope is established at 3:1. The setback is established by measuring inland 3 times the bluff height plus either:

- The average annual rate of recession times 100 years or
- An erosion allowance of 30 meters.

Top Edge of Bluff for determining the landward extent of the 30 meter erosion allowance

Planning horizon: 100 years

Setback amount: the annual erosion rate x exposure timeframe

Setback Established: At time of permitting

Discussion: Ontario recommends a two-step method for calculating the erosion hazard area along Great Lakes-St. Lawrence River System shores:

Step 1. Select one of the following two options:

Option a. Measure the stable slope allowance and add to it the average annual rate of recession times 100.

Option b. Measure the stable slope allowance and add to it an erosion allowance of 30 meters.

Step 2. Measure a 30 meter erosion allowance, “measured toward the land from the top of the shoreline cliff, bluff or bank or the first landward break in slope.”

Compare the measurements from Step 1 and Step 2. Use the greater of the two measurements as the limit of the erosion hazard area.

Dynamic Beach Hazard (OMNR 2001a, page 18)

Unlike Great Lakes states, Ontario requires a setback for dynamic beaches. A dynamic beach in recession may approximate the situation of low terraces of ancient beach deposits that occasionally erode rapidly and slowly build back. Some of these terraces are found on Wisconsin’s Lake Michigan coast.

“A dynamic beach moves and because the elevation of any point on the beach changes, it’s not possible to define the hazard limit of a dynamic beach in terms of a single elevation, as we would a stable shoreline.”

Dynamic beach conditions exist where there are; a) beach or dune deposits along a shoreline, b) these deposits are 0.3 meters or more thick, 10 meters or more in width, and

100 meters or more in length along the shoreline, and where the wind fetch over water is more than five kilometers.

In prolonged periods of low lake levels, it may appear that the upper portion of a beach has stabilized, beach ridges have formed and become vegetated. It may look like development can be expanded lakeward. “Areas on the Great Lakes, that experience chronic flood and erosion damages, were typically constructed during times of low lake levels.” Identifying a dynamic beach hazard limit helps prevent the lakeward creep of development.

Dynamic Beach Hazard Limit = Flood Allowance + Dynamic Beach Allowance
The flood allowance is 15 meters (horizontal); same as in the Flood Hazard determination. The dynamic beach allowance is 30 meters.

Therefore, the dynamic beach hazard limit is a horizontal distance of 45 meters measured landward from the 100 year flood elevation intersection with the shore.

“If the dynamic beach is subject to erosion or is receding, the flooding hazard limit is added to the horizontal distance representing 100 times the average annual recession rate, plus dynamic beach allowance of 30 meters”. (italics are mine).

Ontario allows a planning authority to undertake a study to determine the dynamic beach limit based on the flooding hazard limit plus a dynamic beach allowance determined by consultants.

Hazardous Sites: Unstable Soils and Bedrock

Ontario (and Quebec) have some areas with unstable marine (Leda) clay soils. These soils were laid down long ago when the land was covered with an ocean. Salt matrices exist as part of the soil structure. As new freshwater enters the soil and dissolves the soil structure, the soil becomes much weaker. There have been some major slope failures in these provinces that have led to many homes being engulfed and lives lost as the slopes suddenly begin to flow like a river. Leda clay failures have the second highest rate of occurrence in Canada, next to rock falls (OMNR 2001). Parts of southeastern Ontario are dominated by Leda clays.

The horizontal extent of hazard in a Leda clay area is considered “a horizontal allowance of 1.5 times the distance of the previous failure measured landward from the toe of the failure” (OMNR 2001a, page 27). A geotechnical engineering study may be undertaken as an alternative to this “rule-of-thumb”.

Peat soils, and other highly-organic soils are other forms of unstable soil with such site-specific variations in properties that Ontario does not propose a rule-of-thumb for estimating the size of such hazard areas. Similarly, Ontario considers Karst formations to be a type of unstable bedrock that defies rule-of-thumb formulations. Karst formations are “areas where water flowing over and through limestone and dolomite bedrock

deposits creates sinkholes, trenches and underground caverns.” (OMNR 2001a, page 29). Karst formations are found along the Niagara Escarpment in Ontario. For Karst formation shores, OMNR 2001a references the MNR Technical Guide for Hazardous Sites (1996).

Where Development May, or Must Not Occur (OMNR 2001a, page 12):

“Development will generally be directed to areas outside of hazardous lands adjacent to the shorelines of the Great Lakes – St. Lawrence River System” and areas outside of hazardous sites. “Development and site alteration will not be permitted within defined portions of the dynamic beach”. Except for dynamic beaches, “development and site alteration may be permitted in hazardous lands and hazardous sites provided that all of the following can be achieved:

- the hazards can be safely addressed, and the development and site alteration is carried out in accordance with established standards and procedures,
- new hazards are not created and existing hazards are not aggravated,
- no adverse environmental impacts will result,
- vehicles and people have a way of safely entering and exiting the area during times of flooding, erosion and other emergencies, and,
- the development does not include institutional uses or essential emergency services or the disposal, manufacture, treatment or storage of hazardous substances.”

References:

Ecologistics Limited. January 1993. Detailed evaluation and assessment of shoreline management practices in the United States. Final report prepared for the Great Lakes Commission and the U.S. Army Corps of Engineers (Detroit District) in support of the IJC Levels Reference Study, Working Committee 2, Land Use and Shoreline Management Task Group. Waterloo, Ontario.

OMNR. 2001a. Understanding natural hazards. An introductory guide for public health and safety policies 3.1, provincial policy statement. Ontario Ministry of Natural Resources. 40 pages. http://www.mnr.gov.on.ca/MNR/pubs/nat_haz1.pdf

OMNR. 2001b. Great Lakes-St. Lawrence River System and large inland lakes. Technical guides for flooding, erosion and dynamic beaches in support of natural hazards policies 3.1 of the provincial policy statement. CD published by Watershed Science Centre, Trent University, Peterborough, Ontario, Canada.

Great Lakes States

Pennsylvania

Introduction: Pennsylvania's coastal line on the Great Lakes consists of bluffs that are receding. The Pennsylvania Bluff Recession and Setback Act (BRSA) was passed in 1980 to prevent damages from this coastal hazard. The act requires new residential, commercial and industrial structures to be outside Bluff Recession Hazard Areas (BRHA)—areas designated as hazardous because of active bluff recession. The act requires a minimum setback distance, determined by estimating the economic life of a structure and multiplying the result by the local bluff recession rate per year (in feet).

Setback reference: Top Edge of Eroding Bluff

Planning horizon: 50 years – residential
75 years – commercial
100 years - industry

Setback amount: the annual erosion rate x planning horizon

Setback Established: At time of permitting

Analysis: The bluffs on Pennsylvania's Lake Erie shoreline are made up of glacial sediments that in some cases these bluffs rise 200 feet above the lake. These unconsolidated (loose) glacial sediments include sand, gravel and clay - all very susceptible to erosion. Waves undercut the bluffs causing slumping which can be accelerated by groundwater seepage and surface water runoff. Pennsylvania's bluffs are receding at a rate of approximately one foot per year.

The Bluff Recession and Setback Act (BRSA) (passed in 1980) regulates the location of new buildings and improvement to existing buildings located in bluff recession hazard areas. Eight coastal municipalities with designated active bluff recession areas were required to enact local zoning ordinances that place restrictions on development in these areas. The State of Pennsylvania developed a model ordinance for municipalities to follow and provides financial and technical assistance for local administration and enforcement of the BRSA.

The BRSA seeks to protect property owners and their investment decisions, prevent damage to utility lines, and eliminate hazards created by the collapse of structures into Lake Erie.

The Ordinary High Water (OHW) mark and Ordinary Low Water (OLW) mark for Lake Erie have been determined to be 573.4 NAVD 88 and 569.2 NAVD 88 respectively. Any development on lands between these 2 elevations requires a joint federal and State permit.

The Pennsylvania Coastal Zone Management (CZM) Program uses a system of control point monuments, global positioning system technology (GPS), regular physical inspection, low-level fly overs, aerial photography and laser mapping to monitor bluff recession rates. A geographic information system (GIS) is used to store and manage all related bluff information.

CZM offers technical advice to bluff property owners at no cost in an effort to fully inform residents of the dynamic processes of bluff recession and shoreline erosion. Structural shoreline stabilization, biotechnical slope restoration, vegetation management, and site best management practices are all activities property owners may undertake to slow the rate of bluff recession. Beyond local building permits, other construction activities in bluff areas may require additional permits from DEP's Northwest Regional Office or the Erie County Conservation District if there are impacts on wetlands and watercourses. Encroachments in the area between the ordinary high water mark (573.4 ft.) and ordinary low water mark (569.2 ft.) will require a joint state and federal permit. Construction below the low water mark requires a submerged lands license from DEP, since public trust lands owned by the Commonwealth will be impacted.

References:

- [PA Seagrant: Pennsylvania's Bluff Recession and Setback Program](#) 
- [PA DEP Factsheet: Bluff Erosion - A Lake Erie Coastal Hazard](#)

Ohio

Introduction: Under Title XV Chapter 1506 in the Ohio Revised Code, the Coastal Management Program for Ohio is explained. The Ohio Department of Natural Resources (ODNR) is responsible for managing coastal areas by analyzing recession of the Lake Erie shore and forecasting erosion rates every ten years. Once the study has been completed, the State must notify local governments of any changes they found, updating their records for Coastal Erosion Areas. A Coastal Erosion Area designation only affects new development on land parcels or additions to existing development greater than 500 sq. ft.

Jurisdiction: Coastal Erosion Area – area predicted to erode 9 feet or more in 30 years – calculated using erosion rates associated with transects on maps developed by Ohio DNR.

Reference Feature: Top of bluff, bank, or beach ridge

Planning horizon: 30 yrs

Covenant recorded: No – however, a seller must disclose that all or part of the property is within a designated Coastal Erosion Area on the Seller Disclosure form that is required with all residential real property transactions in Ohio.

Setback amount: No setback required.

Setback Established: None required.

Permit required: A Coastal Erosion Area Permit is granted by ODNR if site will be protected by an erosion control measure that will effectively protect the building or septic system.

Terminology: Coastal Erosion Area – land due to be lost if actions is not taken

Erosion Hazard Areas: Areas delineated on maps and in tables available by ODNR

Source:

<http://www.ohiodnr.com/coastal/regs/factsheets/cmguide5.htm>

New York

Introduction: Under the Environmental Conservation Law Article 34, the Department of Environmental Conservation, Bureau of Flood Protection developed a model local law for Coastal Erosion Hazard Area Management. The Model Law was originally prepared by the St. Lawrence/Eastern Ontario Commission to facilitate local government authority and responsibility over coastal areas. This model law aims to serve the needs of upstate and the New York City coastal regions. The law is meant to minimize damage to structures from flood, erosion, and other natural hazards and restrict public investment in development that will encourage erosion in sensitive areas.

The Model Law is State level, State administered minimums that municipalities can use to write their coastal management ordinances. Local governments are given the option to compose their own program, but it must be certified by the State. If the local municipality chooses to do nothing, all development and coastal management issues will be administered by the State. The following information is based on the State Model Law.

Setback reference: Top Edge of Eroding Bluff

Planning horizon: 40 yrs

Setback amount: the annual erosion rate x 40 yr. In beach areas, a fixed setback is defined as 25 feet from a change in beach to upland.

Covenant recorded: --

Setback Established: At time of permitting

Terminology: Structural Hazard Area – Shoreland located landward of natural protective features and having shoreline receding at a longer time average recession rate of one foot or more per year.

Natural Protective Feature Area – A land/water area that if altered would be less effective against erosion

Erosion Hazard Areas: Area of coastline which is a structural hazard area or natural protective feature area

Bluff Impact Zones: Landward limit 25ft of receding edge (erosion) or point of inflection atop the bluff (no erosion)

Shore impact zone: Bluff or dune present– land that extends from the mean low water line to the waterward toe of dune or bluff
No bluff or dune -- 100ft landward of physiographic change or permanent vegetation (whichever is most waterward).

Minnesota

Introduction: State Statutes recognize the Lake Superior North Shore Management Plan and requires counties and those cities designated by the commissioner adopt land use regulations that comply with the plan. The North Shore Management Plan (adopted 11/29/88) requires erosion hazard setbacks in areas with recession rates greater than 1 ft./yr (called erosion hazard areas). Setback requirements apply to structures and waster disposal systems.

Setback reference: Top Edge of Eroding Bluff

Planning horizon: 50 years

Setback amount: the annual erosion rate x 50 years + 25 ft (to allow for structure relocation),

if long term erosion data is unavailable, setback is 125 ft.

Covenant recorded: At the time of permitting and/or sale of a property within an Erosion Hazard Area, a covenant is recorded against the property that states that it is in an Erosion Hazard Area and notes that there may be future restrictions subject to local ordinances.

Setback Established: At time of permitting

Terminology -

Erosion Hazard Areas: Areas with recession rates greater than 1 foot per year.

Bluff Impact Zones: Land located within 20 feet of the top edge of the bluff. Structures and accessory facilities, except stairways and landings, must not be placed within bluff impact zones.

Shore impact zone: Land located between the ordinary high water mark of public water and a line parallel to it at a setback of 50 per cent of the structure setback.

Michigan

Introduction: Under the Department of Environmental Quality (DEQ), the Land and Water Division is charged with monitoring Michigan's extensive coastline. The Shorelands Protection and Management Program, by way of the Natural Resources and Environmental Protection Act 1994 PA 451, acts to protect consumers against natural hazards like coastal flooding and erosion. The program also aims to preserve the natural environment along the coast.

In order to monitor coastal erosion in Michigan the DEQ conducts a study every ten years. One objective of this study is to monitor and record erosion rates. If rates increase a foot or more in area of study, the area is designated as a "High Risk Erosion Area." If the area is found to be a High Risk Erosion Area, then structure setbacks become more regulated. Depending on the size, number of living units and type of construction of the structure, setbacks will be based on either a thirty year or sixty year planning horizon. In addition, any person or local government agency proposing to erect, install, move, or enlarge a permanent structure on a parcel must obtain a permit prior to the commencement of construction. If erosion rates are found to have little change, then building setbacks don't change.

There is also a number of overlaying zoning districts that coastal communities may choose to use. These are designed specifically for coastal issues, helping to mitigate erosion and protect consumers by minimizing the impact of development in sensitive areas. All are listed on the DEQ's website, and are provided below:

High Risk Erosion Area overlay Zone (Erosion Hazard Line Version) – Regulate areas based on structure setbacks from Erosion Hazard Line.

High Risk Erosion Area Overlay Zone (Bluffline Version) -- Regulate areas based on structure setbacks from the Bluffline.

Great lakes Shoreline Protection Overlay Zone – Overlaid on top of existing zoning; meant for legally defined shoreline zone to protect natural character, controlling erosion, and maintaining native vegetation and wildlife.

Sample Critical Dune Areas Ordinance – Meant to regulate and protect unique features to dune development and ecosystems.

Lake Superior Shoreline/Dune Protection Overlay – Written by Chocolay Township in the Upper Peninsula, meant to protect the unique dune coastline.

Reference feature: High Risk Erosion Areas -- From the Erosion Hazard Line
Bluffs – Top of bluff.- For bluffs with >60% slope and 100ft+ elevation setback 30ft

Planning horizon: 30 yrs for readily-movable structures < 3,500 sq. ft.
60 yrs for structures > 3,500 sq. ft. or structures not readily moveable.

Setback amount: Low Bluffs -- the Projected Recession Distance from the Erosion Hazard Line.

High Bluffs -- setbacks distance is calculated by adding 1 to the product of the percentage points of slope over 25% and 0.05 to a maximum of 2.0. The answer is multiplied by the projected recession distance in feet. Here's an example:

$$\text{Percent Slope } 1.0 \text{ (Percent Slope over } 25\% \times 0.05) \\ \text{Multiplier } 25 \text{ } 1.0+ (0 \times 0.05) = 1$$

$$30 \text{ } 1.0+ (5 \times 0.05) = 1.25 \\ 35 \text{ } 1.0+ (10 \times 0.05) = 1.5 \\ 40 \text{ } 1.0+ (15 \times 0.05) = 1.75 \\ 45 \text{ } 1.0+ (20 \times 0.05) = 2.0$$

In designated "High Risk Erosion Areas" minimum of 30yr setback for readily-movable structures that don't exceed 3500 sq ft; 60yr setback for structures over 3500 sq ft or not readily movable. (There is also 15ft buffer added for serious storms).

Setback Established: At time permit is issued by MDEQ

Erosion Hazard Areas: Areas w/ erosion of 1ft or more per year

References:

High Risk Erosion Area overlay Zone (Erosion Hazard Line Version)

http://www.nwm.org/downloads/hrea_overlay_zones_blufferosion_hazline.htm

High Risk Erosion Area Overlay Zone (Bluffline Version)

<http://www.deq.state.mi.us/documents/deq-ess-cm-ftg-AppendixK-HREAOOverlayZones-BluffErosionHazLine.pdf>

Great lakes Shoreline Protection Overlay

Sample Critical Dune Areas Ordinance

<http://www.deq.state.mi.us/documents/deq-ess-cm-ftg-AppendixL-CriticalDuneOrdinance.pdf>

Lake Superior Shoreline/Dune Protection Overlay.

<http://www.deq.state.mi.us/documents/deq-ess-cm-ftg-AppendixM-SampleSandDuneOverlay.pdf>

Indiana

Introduction: The Lake Michigan Coastal Program (LMCP) uses the process of Areas of Particular Concern (APC) designation to help state agencies and local governments identify important issues along the coast. At this time there are six APC designations along Indiana coastline. Erosion is considered to be one of them, especially in locations where development has yet to occur.

Another related issue has been the recent development of the Marquette Greenway Plan (MGP). In order to recapture much of the shoreline for public use, the Marquette Greenway Plan hopes to preserve part of the Lake Michigan coastline in Indiana. Undertaken by the cities of East Chicago, Gary, Hammond, Portage, and Whiting, a bicycle/pedestrian pathway along with a 200ft setback for any new development have been suggested as part of the plan that aims to preserve the western half of Indiana's coastline.

Sources:

Most recent news on Plan: <http://www.hydepark.org/transit/solkftaccess.htm>

Summary: <http://www.in.gov/dnr/lakemich/news/marquettepark.pdf>

Illinois

Introduction: The state does not currently have a coastal zone management program, but beginning in 2004, the Illinois Department of Natural Resources (IDNR), the Illinois Environmental Protection Agency (IEPA), and the Lieutenant Governor's Office have been collaborating on creating a program. The Program's "purpose will be to support and coordinate partnerships among local, state and federal agencies, and local organizations, to share information on coastal care efforts and to preserve, protect, restore, and where possible, enhance the coastal resources in Illinois."

Since Illinois has a relatively small amount of coastline (only 110 miles of landward coast), but one of the largest urban populations in the country, development along the Illinois coast has a significant impact on the Great Lakes Water System. The Program hopes to undertake many coastal issues including preventing and monitoring beach erosion along with providing technical assistance on shore protection and bluff stabilization.

Sources:

A Coastal Management Program for Illinois

http://dnr.state.il.us/owr/includes/CMP/OWR_CMP-Home.htm

Non- Great Lakes States

Florida

Introduction - The state of Florida began regulating shoreline development in 1971. Along the beachfront, the state imposes stricter construction standards to minimize damage to the natural environment, private property, and human life. There are several regulatory programs that are in affect in coastal areas.

Setback reference: Mean High Water Line
Planning horizon: 30 yrs
Setback amount: the annual erosion rate x 30 yr.
Covenant recorded: --
Setback Established: At time of permitting

Terminology:

Coastal Construction Control Lines (CCCLs): The CCCL is determined by the Florida Department of Environmental Protection's computer model of a 100-year storm. The model predicts how far a storm surge would reach inland and the landward limit of a 3 foot wave associated with the 100-year storm surge.

The Coastal Building Zone: In 1985, the Florida State Legislature enacted the Coastal Protection Act to minimize damage to the natural environment, private property, and life through the imposition of strict construction standards. The Act covers land from the seasonal high water line to 1500 feet landward of the CCCL.

Analysis:

Coastal Construction Control Line (CCCL) Program

The coastal construction regulatory program, administered by the Department of Environmental Protection (DEP), began in 1965 with the enactment of the Beach and Shore Preservation Act, Florida Statutes (s.) Chapter 161. Until 1970, the Department's regulatory jurisdiction (s.161.041) was limited to coastal construction activities located upon Florida sovereign lands below the mean high water of any Florida tidal water.

In 1970, the Florida State Legislature enacted s.161.052, which established a 50 foot setback from the mean high water line. A variance was needed to conduct certain construction activities seaward of this setback line. In the very next year, the Legislature enacted s.161.053 which called for the establishment of what was then called "coastal construction setback lines." This provision was amended in 1978 and the current name for these lines, "coastal construction control lines" or CCCL was coined. This 1978 amendment also clarified that the lines should be established to represent the area subject to the effects of a 100-year storm surge, and that major habitable structures located

seaward of these lines should be designed to withstand the combined wind and wave forces associated with a 100-year storm surge.

The purpose of the CCCL program is to preserve and protect Florida's coastal beach-dune system from imprudent construction and still provide reasonable use of private property. Construction can jeopardize the shoreline's stability, accelerate erosion, provide inadequate protection to upland structures, endanger adjacent properties, or interfere with lateral public beach access. Within the boundaries of the CCCL, no person, firm, corporation, or governmental agency may construct any type of facility or building without a CCCL permit, unless it is exempted or grandfathered in. Regulated activities include everything from large multifamily developments to dune walkover structures.

The DEP has permit jurisdiction seaward of the CCCL up to the mean high water line. The CCCL is determined by DEP's computer model of a 100-year storm. The model predicts how far a storm surge would reach inland and the landward limit of a 3 foot wave associated with the 100-year storm surge. The Coastal Construction Control Line is drawn at the landward limit of the storm's reach. Building in the CCCL area is allowed, but buildings must meet all regulations including wind-load standards. Houses must be built to withstand 110mph winds except for the Keys, where houses must be able to withstand 115mph winds.

In the CCCL zone, there is a 30 year erosion setback. The 30 year erosion determination is evaluated on a site-by-site basis based on shoreline change rate information obtained from historical measurements by DEP for each permit application (Florida Administrative Code 62B-33.024). The 30 year erosion determination does not factor in sea level rise. No major structures are eligible to receive a CCCL permit seaward of the 30 year erosion projection except for coastal or shore protection structures, minor structures, piers, and single family dwellings meeting specific siting requirements as set forth in s.161.053(6).

The Coastal Building Zone

In 1985, the Florida State Legislature enacted the Coastal Protection Act to minimize damage to the natural environment, private property, and life through the imposition of strict construction standards. The Act covers land from the seasonal high water line to 1500 feet landward of the CCCL. In those areas fronting on the ocean but not included within an established CCCL, the Coastal Building Zone includes the land area seaward of the most landward V-zone line, as established by the Federal Emergency Management Agency (FEMA).

The Department of Community Affairs (DCA) has oversight in the Coastal Building Zone but can not make rules. The DCA helps provide technical assistance and training for local building officials. The law requires each local government to adopt as part of its building code the requirements established in s.161.55, and such requirements are enforced by the local enforcement agency. On July 1, 2001 a new Florida Building Code covering the entire state of Florida will be in effect.

Under the Coastal Protection Act, construction regulations for elevation and foundation design are based on NFIP rules but wind regulations follow standard building code rules. Major structures are required to be designed, constructed, and located in compliance with NFIP regulations as found in 44 C.F.R. Parts 59 and 60 or stricter local flood damage prevention rules s.161.55. Major structures must meet the standards of the statewide building code. In accordance with NFIP rules, older buildings do not have to meet new code standards unless a dwelling's improvement costs exceed 50% of market value during a 5 year timeframe. If major improvements exceeding 50% of the market value are made within five years the house must also be improved to meet new code standards.

The construction standards enforced by local governments under s161.55 (Coastal Building Zone) are less restrictive than the construction standards enforced by the Department of Environmental Protection under s.161.053 (CCCL Program). This is due in part to the fact that the NFIP Federal Rate Maps consistently identify lower base flood elevations for a 100-year storm event than the State of Florida CCCL Reestablishment Studies. The two agencies use different computer models to determine base flood elevation (BFE) for 100-year storm events.

Regulations for barrier islands and non-sandy shorelines are different. The Coastal Building Zone on a barrier island covers land from the seasonal high water line (SHWL)² to 5000 feet landward of the established CCCL or the entire island, whichever is less.

The non-sandy shorelines along a major body of water have no CCCL, but do have a Coastal Building Zone to the tip of the V-Zone and NFIP regulations apply.

North Carolina

Introduction: North Carolina has 320 miles of ocean coastline. Over half of the state's ocean coastline experiences erosion rates of 2 feet per year or greater, with 20 percent exceeding 6 feet per year. The coastal management program that has evolved since 1974 has planning, regulatory, land acquisition, and policy development components. The program regulates new development, restricts shore erosion-control practices, plans for redevelopment and relocation of damaged and threatened structures, purchases land for beach access, and develops public education programs. The Coastal Resources Commission has adopted three goals for the management program:

1. Minimize loss of life and property resulting from storms and long-term erosion.
2. Prevent encroachment of permanent structures on public beaches.
3. Reduce public costs of inappropriately sited development.

North Carolina adopted a statewide minimum ocean-front setback requirement for all new development in 1979. Effective in 1983, all coastal local governments have been required to include a hazard mitigation element in their mandatory land use plans.

Setback reference: Vegetation line

Planning horizon: 30 years – small structures
60 years – > 4 units or > 5,000 sq. ft.

Setback amount: the annual erosion rate x planning horizon

Setback Established: At time of permitting

References:

- <http://www.nccoastalmanagement.net/hazards/erosion.htm>

Rhode Island

Introduction - Much of the Rhode Island shoreline is eroding. Sections of the south shore barriers have erosion rates of more than three feet per year. The Coastal Resources Management Program (CRMP) has developed regulations for reconstruction after severe storms (Section 180. Emergency Assents). The regulations also are designed to minimize the impact of coastal hazards - regulating where to build on a vulnerable property (Section 140. Setbacks), construction of shoreline protection facilities (various sections), and beneficial reuse of dredged materials help to mitigate some of the hazards associated with coastal living. Sea level rise is a hazard that is only indirectly addressed in the CRMP.

In critical erosion areas on barriers, all residential construction with less than six units must be set back 30 times and commercial property 60 times the average annual erosion rate. These regulations were enacted about thirty years ago. The state has no policy for when the setback is gone and the structure is on the active beach.

Setback reference: Mean High Water Line
Planning horizon: 30 yrs – residential with less than six units
60 yrs – residential with greater than six units and commercial
Setback amount: the annual erosion rate x planning horizon
Covenant recorded: --
Setback Established: At time of permitting

Texas

Introduction: Texas has one of the highest rates of coastal erosion in the country. Much of the Texas Gulf Coast is eroding at rates of 5 to 10 feet per year, with an average rate of 6 feet per year. An area of particular concern is western Galveston Island, where erosion rates reach up to 70 feet per year (this rate may be caused by an incident such as a storm). There is an average yearly loss of 42 acres due to coastal erosion.

Areas with "Critical Erosion", such as western Galveston Island have been identified. "Critical Erosion" is defined as locations with greater than two feet per year erosion where infrastructure, habitat, public health, safety or welfare is threatened. In addition, there are "hot spots" that are monitored on a case-by-case basis over time. There are no set criteria for "hot spots," however several known areas with erosion rates greater than 10 feet/year have been identified through the Coastal Erosion and Response Act (CEPRA) funding application process.

According to the most recent Coastal Erosion Planning and Response Act (CERPA) Report, approximately 64% of Texas' 369 mile gulf coast is critically eroding. The erosion rates range from 5 to 10 feet per year in these areas and have reached up to 70 feet per year in areas on western Galveston Island. In 2005, the highest erosion rate occurred along Matagorda Island where rates were over 46 feet per year.

Setback reference: Line of Vegetation (LOV)

Planning horizon:

Setback amount:

Setback Established:

Analysis:

There are no statewide setback requirements for new construction in Texas. Both counties and cities can mandate a regulatory setback to address beach erosion. Currently, the only local governments to mandate setbacks are the City of Galveston, South Padre Island and Cameron County.

The Texas Coastwide Erosion Response Plan: 2004 Update states that the Texas coast is experiencing significant erosion because there is not enough sediment in the depositional system to balance with rising relative sea levels and respond to coastal storms. The report goes on to state that man-made structures along the shoreline are not allowing the shoreline to naturally migrate landward and upward. As a result, structures along the shoreline will be threatened and that beaches will narrow and/or disappear if no action is taken to restore the beach. Texas does have real estate disclosure laws (Texas Natural Resources Code 61.025 Disclosure to Purchaser of Property) for homes in high erosion areas.

Gulf and Bay Shoreline Change Rate Maps are available online. These maps depict the average annual erosion rate along segments of the Texas shoreline.

<http://www.glo.state.tx.us/coastal/erosion/erosionrates.html>

The most up to date information regarding coastal erosion is available in the Coastal Erosion Planning and Response Act (CEPRA) [Report](#) to the 79th Texas Legislature in April 2005. According to this report, 64% of Texas' 369.3 mile gulf coastline is critically eroding. The highest rate of erosion, 46.2 feet/year was recorded along the 2.5 mile long section of Matagorda Island.

Texas Bureau of Economic Geology has an online mapper that displays the coastal erosion data for the gulf coast.

<http://txcoast.beg.utexas.edu/website/uppercoast/viewer.htm>

The Texas Open Beaches Act

The state owns submerged lands to the line of mean high tide or higher high tide. The public has an easement for access and use of a public beach from mean low tide of the Gulf of Mexico landward to the natural line of vegetation or larger contiguous areas to which the public has acquired a right of use or easement. Structures that become seaward of the line of vegetation are subject to removal at the property owner's expense.

Construction cannot be conducted on the public beach, which extends to the line of natural vegetation (LOV), per beach/dune regulations. The public beach is a "rolling easement" that moves with the LOV. More specific requirements, such as the prohibition of placing concrete slabs and other impervious materials within 200 feet of the LOV, are included in the beach/dune rules.