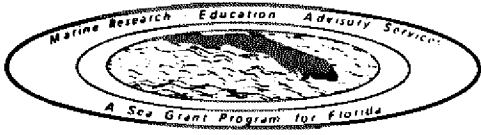


FLORIDA COOPERATIVE EXTENSION SERVICE



Marine Advisory Program

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Coastal Construction Setback Line

James A. Purpura and William M. Sensabaugh



COASTAL CONSTRUCTION SETBACK LINE

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INTRODUCTION

The State of Florida Department of Natural Resources (DNR) has been charged by the Legislature with the responsibility of establishing construction setback lines along the sand beaches of the Atlantic Ocean and Gulf of Mexico. The purpose of this paper is to discuss the setback line law and to describe how the location of the setback line is determined.

SETBACK LINE

In 1970 the Florida Legislature made the following statements regarding the beaches of the State.

The attraction of Florida's beautiful beaches and shores account for a substantial portion of the state's annual tourist trade;

Beach and shore erosion is a serious menace to the economy and general welfare of the people of this state;

Unguided development of these beaches and shores coupled with uncontrolled erosive forces are destroying or substantially damaging many miles of our valuable beaches each year;

If construction or excavation is allowed to encroach upon the line of mean high water too closely, erosive processes are initiated or accelerated both at the site involved and on neighboring beach and shore properties as well;

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Preservation of our beaches and shores is therefore a subject of great public interest and concern which requires appropriate action by the legislature to prevent further loss to one of our greatest natural resources;

The greater public interest compels that certain reasonable restrictions be placed upon the location of coastal construction and excavation even though such construction or excavation be located on privately held land.

Then they passed into law the requirement that, along the sand beaches which face the open waters of the Atlantic Ocean or Gulf of Mexico, any construction or excavation must be at least 50' upland of the line of mean high water. It was soon realized that a 50' setback was inadequate in many areas of the State. The law, for technical reasons, was also found to be very difficult to enforce. The following year the Legislature passed another law designed to remedy these defects. This, the coastal construction setback line law, sec. 161.053, F. S. is the subject of this discussion.

The law states, in part, the following:

(1) *The department of natural resources, acting through the division of marine resources, shall establish coastal construction setback lines on a county basis along the sand beaches of the State of Florida fronting on the Atlantic Ocean and the Gulf of Mexico. Such construction setback lines shall be established by the department only after it has been determined from a comprehensive engineering study and topographic survey that the establishment of such setback lines is necessary for the protection of upland properties and the control of beach erosion. No such line shall be set until a public hearing has been held for each area involved. After the department has given consideration to the results of said public hearing, it shall, after considering ground elevations in relation to historical storm and hurricane tides, predicted maximum wave uprush, beach and offshore ground contours, the vegetation line, erosion trends, the dune or bluff line if any exist, and existing upland development, set and establish a coastal construction setback line and cause same to be duly recorded in the public records of the county and municipalities affected, and shall furnish the clerk of the circuit court in each county affected a survey of such line with references made to permanently installed monuments at*

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such intervals and locations as may be considered necessary. Upon the establishment, approval and recordation of such setback line or lines, no person, firm, corporation or governmental agency shall construct any structure whatsoever seaward thereof or make any excavation, or remove any beach material or otherwise alter existing ground elevations, or drive any vehicle on, over or across any sand dune, or damage or cause to be damaged such sand dune or the vegetation growing thereon, seaward thereof except as hereinafter provided. Setback lines established under the provisions of this section shall be subject to review by the department at five (5) year intervals from time of establishment or at the written request of affected county or municipal officials. Any riparian upland owner who feels that such line as established is unduly restrictive or prevents a legitimate use of his property shall be granted a review of the line upon written request. After such review the department shall decide if a change in the setback line as established is justified, and shall so notify the person or persons making the request. The decision of the department shall be subject to judicial review as provided in chapter 120, Florida Statutes.

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Before proceeding with the text of the law the following points should be noted.

- 1) The law does not apply to the shores of inland waters nor does it apply to mangrove, or other non-sand shorelines along the Gulf of Mexico.
- 2) A public hearing must be held before a setback line (SBL) is established. At least one public hearing is held in the county in which a SBL is proposed. When the proposed SBL is presented to the Governor and Cabinet, sitting as the Head of the Department of Natural Resources, in Tallahassee, the Cabinet meeting is open to the public and individuals may present their comments on the proposed line directly to the Governor and Cabinet.

3) At least seven things must be considered before a SBL is proposed:

- a. Ground elevation in relation to historical storm and hurricane tides.
- b. Predicted maximum wave uprush.
- c. Beach and offshore ground contours.
- d. The vegetation line.
- e. Erosion trends.
- f. The dune or bluff line
- g. Existing upland development.

(These will be examined in more detail later)

- 4) A map of the SBL will be placed in the county records. Once the SBL is established a local land surveyor can determine the location of the line "*on the ground*" using that map and the monuments which have been installed along the shore.
- 5) The law prohibits driving vehicles on the sand dunes seaward of the SBL, but it does not prohibit driving on the beach.
- 6) The SBL must be reviewed by the Department of Natural Resources at least every five years, or sooner if so requested by local officials.
- 7) Any beach front property owner may, at any time, request that the SBL on his property be reviewed by the Department of Natural Resources if he feels that the line is unduly restrictive.
- 8) If a property owner is not satisfied with the results of the Department of Natural Resources review a judicial review is provided.

The law goes on to say:

(2) A waiver or variance of the setback requirements may be authorized by the department of natural resources in the following circumstances:

(a) The department may authorize an excavation or erection of a structure at any riparian coastal location as described in subsection (1) upon receipt of an application from a riparian owner and upon the consideration of facts and circumstances, including adequate engineering data concerning shoreline stability and storm tides related to shoreline topography, which, in the opinion of the department of natural resources, clearly justify such a waiver or variance.

Compared to other locations throughout the State, building sites on beach front property have several unique engineering features. Probably the most important of these is the dynamic nature of the beach-dune system. In order to obtain a variance of the setback requirement one must demonstrate to the DNR that adequate consideration has been given to the dynamics of the beach-dune system in the design of the proposed structure or excavation. The primary concern of the DNR in such a case is that the proposed work will not adversely effect the beach.

(b) If in the immediate contiguous or adjacent area a number of existing structures have established a reasonably continuous and uniform construction line closer to the line of mean high water than the foregoing, and if said existing structures have not been unduly affected by erosion, a proposed structure may be permitted along such line on written authorization from the department of natural resources if such proposed structure is also approved by the department of natural resources. However, the department of natural resources shall not contravene setback requirements established by a county or municipality which are equal to, or more strict than those setback requirements provided herein.

This section takes care of those situations where there is a lot without a seawall in the middle of an otherwise seawalled shoreline. There are four requirements for a variance in such cases.

- 1) There must be "a number of existing structures" which are already seaward of the setback line, not just one.
- 2) The existing structures must not have been unduly affected by erosion.
- 3) The proposed structure must be approved by the Department of Natural Resources.
- 4) If the county or municipality in which the proposed structure is to be built has setback requirements a variance from the DNR does not relieve the applicant of the need to also obtain a variance of the local setback requirements.

(c) The department may authorize the construction of pipelines or piers extending outward from the shoreline, unless it determines that the construction of such projects would cause erosion of the beach in the area of such structures.

This section allows for those projects which must incidentally cross the beach such as submarine telephone cables, storm water drain lines, and fishing piers.

Although it is seldom necessary to use them this law does have "teeth" to insure compliance.

(3) Any coastal structure erected or excavation created in violation of the provisions of this section is hereby declared to be a public nuisance, and such structure shall be forthwith removed or such excavation shall be forthwith refilled after written notice by the department directing such removal or filling. In the event that, within a reasonable time, the structure is not removed or the excavation refilled as directed, the department may remove such structure or fill such excavation at its own expense, and the costs thereof shall become a lien upon the property of the upland owner upon which such unauthorized structure or excavation is located.

(4) *Any person violating any provision of this section is guilty of a misdemeanor and, upon conviction thereof, shall be punished by a fine of not less than five hundred dollars (\$500) nor more than one thousand dollars (\$1,000). Such a person shall be deemed guilty of a separate offense for each month during any portion of which any violation of this section is committed or continued.*

If a proposed structure is intended for beach erosion control and if it requires a Coastal Construction Permit from the DNR is it not necessary to also request a variance for that structure.

(5) *The provisions of this section shall not apply to structures intended for shore protection purposes which are regulated by 161.041, Florida Statutes, nor to structures existing or under construction on the effective date of this act, provided such structures shall not be materially altered except as provided in subsection (2).*

This is also the "grandfather clause". If an existing seawall, swimming pool, or other structure is seaward of a new SBL the line will not affect the structure. However, if, after the SBL is established, you want to extend an existing seawall, replace a wooden seawall with a concrete wall, dig up an existing patio and install a swimming pool or otherwise materially alter an existing structure it will be necessary to first obtain a variance.

(6) *The department may by regulation exempt specifically described portions of the coastline from the provisions of this act, whenever it is judgement such portions of coastline because of their nature are not subject to erosion of a substantially damaging effect to the public.*

At this writing no portions of the coastline have been made exempt from the provisions of this law under the provisions of this clause.

(7) *Pending the establishment of construction setback lines as provided herein, the provisions of 161.052, Florida Statutes, 1970 Supplement, shall remain in force; provided that upon the establishment of construction setback lines, the provision of said section shall be superseded by the provision of this section.*

This provides that until the engineered SBL is established the 50' setback remains in effect.

The following description of how the location of a setback line is determined is largely taken from the report of the Coastal Construction Setback Line Study performed for Volusia County.

This law provides that the setting of this line shall be based on data resulting from comprehensive engineering and topographic surveys, erosion trends, predictable storm tides, wave runup, the vegetation line and other technical data.

The DNR, through the Bureau of Beaches and Shores, entered into a contract with the Coastal and Oceanographic Engineering Laboratory of the University of Florida's College of Engineering for the required studies and surveys.

SETBACK LINE FACTORS

The location of a setback line (SBL) from a coastal engineering point of view depends upon certain physical conditions. Factors to be considered in a broad sense are shoreline stability (fluctuations, erosion trends) and topography as related to storm/hurricane tides and wave action. Of the two, perhaps the most important factor is the shoreline stability. There is a need for historical data of long duration.

The first step in a study is to investigate the area in question to determine the need, if any, for a setback line. When the need is established, all available historical data is collected and a topographic and hydrographic survey of the area is carried out if no recent surveys are available.

The general case in Florida will show a lack of historical and good statistical data, therefore, much reliance must be placed on the recent topo-hydro studies correlated with the measured physical parameters of the area.

The following sections describe some of the study factors for the setback line investigation.

Field Program - A permanent, monumented, baseline is placed along the Atlantic or Gulf shoreline of the county. The monuments are located approximately 1,000 ft. apart. Beach profiles from behind the dune (where existing) to a wading depth are taken.

An automatic tide recorder is installed in the study area and operated throughout the study.

Controlled, stereoscopic aerial photographic coverage of the study area is flown and reproduced at a scale of 1" = 100'.

Visual reconnaissance and ground photographic coverage of the entire study area is carried out.

Offshore soundings from the beach to a depth of about 20 to 40 ft. (about 3,100 ft. offshore) are taken. An offshore profile is run at every third monument on the baseline.

Beach Profiles - The shape of the beach and dunes is important in predicting the effects of storms on the beach.

Historical Data - For most areas of the State there are some available sounding data from as much as 100 years ago. Usually, however, not all of the historical surveys cover the entire study area and there may be gaps of many years between surveys. This information is valuable in determining the shoreline trend. Erosion rates, however important, do not always indicate the short term fluctuations that occur

on the beach. These fluctuations can be quite large in magnitude over a short term as a result of certain tide-wave conditions. A shoreline which may have an apparent long term trend of stability can however, suffer quite severe erosion with subsequent accretion-erosion, etc. These cycles are dependent on tide-wave conditions, however, severe damage (i.e. loss of vegetation, structures, etc.) may result during these fluctuations.

Tides - Basic tidal data such as tide range, mean high water level, etc. are obtained from the National Ocean Survey, and the U. S. Army Corps of Engineers. The tide records obtained during the study are necessary to interpret the hydrographic survey.

Winds - The U. S. Naval Weather Service Command has published wind data, such as direction, speed, and duration, for the coastal areas of the State.

Waves - Some historical wave data is available from the same source as the wind data.

Effects of Wind and Waves - As a result of the wind and wave action, the following phenomena are created, which have a direct bearing on the stability of the coastline.

1. Longshore current and littoral drift - The currents affecting the open coast are the longshore currents created by waves breaking at an angle to the shore. The magnitude of the longshore current depends on the breaking wave characteristics, breaking angle and local bottom and shore configuration.

The longshore currents are responsible for sand transport along the coast.

2. Storm Surge and Wave Setup - In addition to the astronomic

tide, northeast storms, hurricanes, and waves are capable of creating extreme high water levels, especially on shallow coastal areas.

Storm surge is the vertical rise in the still water level near the coast caused by wind stresses on the water surface. Very few reliable records are available of water levels on the open coast during major hurricanes which have occurred in the past few decades. In a study of storm tides in Florida, the Department of Coastal and Oceanographic Engineering, University of Florida, has analyzed the normal yearly high tides and high water levels caused by hurricanes and expressed the results as frequency of occurrence for a certain water level to be equaled or exceeded. In that study, all available normal and storm tide data along the coast of Florida before 1959 were analyzed and correlated to provide the tidal level-frequency information for the open coast of Florida. The National Oceanic and Atmospheric Administration (NOAA) has also made tidal-frequency studies for many coastal areas.

Wave setup is the superelevation of the water surface over normal surge elevation due to onshore mass transport of the water by wave action alone. There is little specific data of wave setup for most areas. However, estimates for particular areas and particular storms have been made.

Another factor which may cause an increase in water level is the effect of rainfall, increase in storm tidal levels may occur in coastal areas in the neighborhood of creeks, rivers and inlets.

The water level rise due to reduced atmospheric pressure associated with a hurricane is considered to be included in the original storm tide data.

3. Wave Uprush - Wave uprush is the rush of water up on to the beach surface. While not much field data are available, laboratory test results have been utilized to assist in uprush computations. For a complicated beach surface with changing slopes, the composite slope method has proven to be applicable. Laboratory tests also showed rough surfaces could reduce uprush considerably.

4. Interaction Between the Storm Surge Level, Waves and the Existing Beach Characteristics - For reducing the lengthy computations of wave uprush on a composite profile, a computer program for the IBM 360/65 was developed. This program contains the uprush curves established by laboratory tests and takes surveyed beach profile data and any number of water level and wave conditions as input. The computer performs the necessary computations and gives the uprush elevations or over-topping output for each surveyed beach profile.

For examining the response of the beach profiles to a variety of waves, various combinations of water depth, wave height, and wave period are used to compute the wave runup. The results of these computations usually show that:

- i. the extreme high waves do not cause high uprush due to the fact that they break far from the shoreline;
- ii. lower waves (or reformed waves) with longer period create the highest uprush.

SETBACK LINE CRITERIA

In making the analysis for the setback line the objectives are: to prevent beach encroachment that would endanger the existing beach-dune system; to help prevent existing and future structures from being

unreasonably subject to great or irreparable harm.

In the analysis, the following criteria were all taken into consideration when placing the setback line.

1. The Intermediate Regional Tidal Flood resulting from an Intermediate Regional Hurricane (IRH) as defined by the Corps of Engineers, U. S. Army is used for the determination of a storm surge still water level.

2. A wind wave is chosen for computing the uprush by composite slope method under the storm condition on each of the profiles. This will yield the information about how far landward the uprush will reach.

3. Historical data (erosion trends), and topo-hydro information gathered from the field inspection are finally utilized to adjust the computed distances to a suitable SBL.

In short the SBL analysis considers the following factors: The measured topographic factors which include dune elevations, foreshore slopes, offshore slopes, beach widths, adjacent profiles, upland development and vegetation-bluff lines and the computed dynamic factors which include storm surge elevations, erosion trends, wave uprush, and fluctuations of the beach profiles.

IT SHOULD BE POINTED OUT THAT COMPLIANCE WITH NO CONSTRUCTION SEAWARD OF THE RECOMMENDED SETBACK LINE DOES NOT IMPLY THAT STRUCTURES CAN BE BUILT WITHOUT GIVING DETAILED CONSIDERATION TO THE PROBLEM ASSOCIATED WITH OCEAN FRONT DEVELOPMENT. PROPERTY OWNERS AND DEVELOPERS ARE STRONGLY URGED TO SEEK THE ASSISTANCE OF DESIGN PROFESSIONALS WHO ARE FAMILIAR WITH OCEAN FRONT CONSTRUCTION IN ORDER THAT THEY MAY HAVE A SAFE STRUCTURE WHICH WILL HAVE A MINIMUM ADVERSE EFFECT ON THE BEACH.

SETBACK LINE DESCRIPTION

As required by law, a monumented base line is placed and surveyed along the shoreline. Each concrete monument has a 3-1/2" diameter brass cap on top. The cap is identified as a Florida Department of Natural Resources Monument and also has a range line designation (R1, etc.). The monuments, placed approximately 1,000 ft. apart, are surveyed by a registered land surveyor and referenced to the State System of Plane Coordinates. The location of each monument is shown on the controlled aerial photo plans along with the location of the recommended coastal construction setback line.

Upon adoption by the Governor and Cabinet of the setback line, the line is referenced to the monumented base line and described using the State System of Plane Coordinates and a map of record is filed in the county court house.

SUMMARY

A study of a county's shoreline is made.

A determination of the need for a coastal construction setback line in that county is made.

A recommendation is made regarding the location of the setback line.

Public hearings are held both in the county and in Tallahassee on the proposed location of the setback line.

The proposed location may be changed as a result of the public hearing.

The final location of the line is approved by the Governor and Cabinet.

A map and description of the line are recorded in the county records.

Upon recording the coastal construction setback line (sec. 161.063 F.S.) becomes effective and the 50' setback from the mean high water line (sec. 161.052 F.S.) is superseded.

VARIANCE

The procedures for obtaining a waiver or variance of the setback requirements have been established by the Department of Natural Resources as follows:

GUIDELINES TO BE FOLLOWED IN REQUESTING VARIANCES TO COASTAL CONSTRUCTION SETBACK LINES ESTABLISHED UNDER THE PROVISIONS OF SECTION 161.053, FLORIDA STATUTES.

"VARIANCES"

Section 161.053(2) Florida Statutes, Provides as follows:

(2) A waiver or variance of the setback requirements may be authorized by the Department of Natural Resources in the following circumstances:

(a) The Department may authorize an excavation or erection of a structure at any riparian coastal location as described in subsection (1) upon receipt of an application from a riparian owner and upon the consideration of facts and circumstances, including adequate engineering data concerning shoreline stability and storm tides related to shoreline topography, which, in the opinion of the Department of Natural Resources, clearly justify such a waiver or variance.

(b) If in the immediate contiguous or adjacent areas a number of existing structures have established a reasonably continuous and uniform construction line closer to the line of mean high water than the foregoing, and if said existing structures have not been unduly affected by erosion, a proposed structure may be permitted along such line on written authorization from the Department of Natural Resources if such proposed structure is also approved by the Department of Natural Resources. However, the Department of Natural Resources shall not

contravene setback requirements established by a county or municipality which are equal to, or more strict than those setback requirements provided herein.

(c) The Department may authorize the construction of pipelines or piers extending outward from the shoreline, unless it determines that the construction of such projects would cause erosion of the beach in the area of such structures.

In considering a request for a Variance to an established Coastal Construction Setback line under the provisions of item (a) above it is understood that storm tide information is already on file in the office of the Bureau of Beaches and Shores. An applicant will not be required to duplicate this information, however, submission of such data will be accepted.

Application for Variances must be made to the Bureau of Beaches and Shores on the form attached to these guidelines, or on a similar form prepared by the applicant. The application should include:

1. A statement by the applicant confirming ownership of the subject property and giving the specific reasons why the Variance should be granted.
2. A statement from the applicant that the proposed construction does not violate any local zoning or setback ordinances.
3. A recent survey of the applicants property by a surveyor or engineer, registered in the State of Florida showing the following:
 - a. The location and elevation of the mean high water line for the subject property. (elevation must be referenced to coast and geodetic survey, mean sea level datum)
 - b. Topographic information for the land seaward of the setback line.

- c. The location of the established coastal construction setback line for the full width of the property.
 - d. A plot plan showing the applicants property lines, the proposed construction and the distance from the proposed construction to the setback line at the ends of the construction site.
 - e. If the Variance is requested under the provisions of item (b) of Florida Statutes 161.053(2) the survey should show the existing structures that are considered to have established the construction line. The survey should be drawn to an appropriate scale to show the details of the proposed project. (generally the scale should be between 40 and 60 feet to an inch)
4. Construction plans for the structures or other activities which require a Variance. These plans should include the following:
- a. Cross sections of all sub-grade construction or excavation and in the case of a seawall, a section view of entire seawall showing tiebacks and elevations in relation to mean high water.
 - b. Elevations for the lowest floor (parking lot, etc.) and the first dwelling floor.
 - c. Details of other construction (coastal protection structure, swimming pool, etc.) which is to be included under the Variance application.

Information required under items 2 and 3 above may be waived in specific instances where it is determined by the Bureau of Beaches and Shores to be unnecessary for the consideration of the Variance application. It should be noted, however, that in certain cases it may be necessary to obtain additional information. An on-site inspection by the staff of the Bureau of Beaches and Shores, for projects that have specific features which require close inspection, may be required.

FORM TO BE USED IN REQUESTING VARIANCES TO COASTAL CONSTRUCTION SETBACK LINES ESTABLISHED UNDER THE PROVISIONS OF SECTION 161.053, FLORIDA STATUTES.

NAME

ADDRESS

PHONE NUMBER _____

Location of property for which Variance is requested: _____
(Location must be referenced to Department of Natural Resources Baseline Monuments) i.e., 400 feet south of _____
DNR monument No. 89, etc.

Type of construction or activity
Variance requested for: _____

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This public document was promulgated at a cost of \$400 or 10 cents per copy, to provide current facts concerning the coastal construction setback line.

The Marine Advisory Program functions as a component of the Florida Cooperative Extension Service, Joe N. Busby, dean, in conducting Cooperative Extension work in Agriculture, Home Economics, and Marine Sciences, State of Florida, U.S. Department of Agriculture, U.S. Department of Commerce, and Boards of County Commissioners, cooperating. Printed and distributed in furtherance of the Acts of Congress of May 8 and June 14, 1914.

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