



The Likelihood of Shore Protection: Florida

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Governments Plan for Development of Land Vulnerable to Rising Sea Level: Florida

Summary

Sea level is rising about one inch about every ten years along the coast of Florida. Ocean shores are eroding along the Atlantic coast, floods are becoming more severe, and wetlands are converting to open water. These effects would become more commonplace if rising global temperatures cause the rate of sea level rise to accelerate. The Intergovernmental Panel on Climate Change, for example, estimates that by the end of the next century, sea level is likely to be rising 0 to 3 inches per decade more rapidly than today (excluding the possible impacts of increased ice discharges from the Greenland and Antarctic ice sheets).

Rising sea level erodes beaches, drowns wetlands, submerges low-lying lands, exacerbates coastal flooding, and increases the salinity of estuaries and aquifers. Coastal communities must ultimately choose between one of three general responses:

- Armor the shore with seawalls, dikes, revetments, bulkheads, and other structures. This approach preserves existing land uses, but wetlands and beaches are squeezed between the development and the rising sea.
- Elevate the land and perhaps the wetlands and beaches as well. This approach can preserve both the natural shores and existing land uses, but often costs more than shoreline armoring
- Retreat by allowing the wetlands and beaches to take over land that is dry today. This approach can preserve natural shores, but existing land uses are lost.

Each of these approaches are being pursued somewhere in Florida. Dikes protect some low-lying lands southwest of Miami from flooding. Many estuarine shores have been armored with wooden bulkheads or stone revetments. The Corps of Engineers has placed sand onto many ocean beaches. Some residential and agricultural lands have been converted to wetlands adjacent to the Everglades southwest of Miami, as well as in Cape Sabel.

Nevertheless, there is no explicit plan for the fate of most low-lying coastal lands as sea level rises. Environmental planners do not know whether to assume that the coastal wetlands will be lost or simply migrate inland. Those who plan coastal infrastructure do not know whether to assume that a given area will be submerged by rising waters or protected from the sea. And even in developed areas that will presumably be protected, public works departments do not know whether to assume that the land surfaces will gradually be elevated or that the area will be protected with a dike.

Under a grant from EPA to the Southwest Florida Regional Planning Council, six of the regional planning councils in Florida developed maps that distinguish shores that are likely to be protected from the sea from those areas that are likely to be submerged, assuming current coastal policies, development trends, and shore protection practices. The purpose is primarily to promote the dialogue necessary to decide where people will yield the right of way to the inland migration of wetlands and beaches, and where we will hold back the sea. The authors consulted with county government and in some cases city governments and other key stakeholders in each region about existing and future development, and coastal policies that influence development and shore protection decisions. The final reports and maps were approved by the regional planning councils. The result is a statewide series of maps that represent the best available assessment by local governments and regional planning councils regarding the lands that are likely to be protected and likely to rereat given current policies.

The sea level rise planning maps divide the dry land close to sea level into four categories of shore protection:

- Shore protection almost certain (brown);
- Shore protection likely (red);
- Shore protection unlikely (blue); and
- No shore protection, i.e., protection is prohibited by existing policies (light green).

For reasons related to data quality, our study area includes lands within about 7 to 8 feet (2.5 meters) above the tides. (We did not project the fates of secured federal installations but depicted them in red so that they stand out.)

One can also view these maps as representing three shore protection scenarios. For example, in an "enhanced wetland migration" scenario, only the areas depicted in brown would be protected; but in an "enhanced shore protection" scenario, only the areas depicted in light green would be submerged. Thus the prospects for shore protection are best understood in the areas shown in brown and light green, while those shown in red and blue are most amenable to coastal planning.

Results

Six different regional planning councils have prepared sea level rise planning maps and studies regarding the likelihood of shore protection for their particular regions. No one has yet developed a statewide synthesis report of the six studies, but this site has brief summaries of the reports for Northeast Florida, East Central Florida Treasure Coast, and South Florida. We have prepared a summary table of the area of land in Florida vulnerable to sea level rise by likelihood of shore protection for the four regions along the Atlantic Coast, based on the results of the four Florida Atlantic chapters from *The Likelihood of Shore Protection* (PDF 8 MB).

Complete reports and/or GIS data are available on the following regional planning council websites.

- [East Central Florida Regional Planning Council](#)
- [Treasure Coast Regional Planning Council](#)
- [South Florida Regional Planning Council](#)
- [Southwest Florida Regional Planning Council](#)
- [Tampa Bay Regional Planning Council](#)

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