



Town of South Bethany Mapping Update

Introduction

The Federal Emergency Management Agency (FEMA), its mapping partners, and the U.S. Army Corps of Engineers (USACE), along with input and participation by coastal counties and communities, completed a new coastal Flood Insurance Study (FIS) of the entire mid-Atlantic coast. The new analysis and initial preliminary Flood Insurance Rate Map (FIRM) for Sussex County, Delaware including the Town of South Bethany, was completed in early 2013.

What the New Analysis Shows

The FIRM panels previously produced for this area are dated January 6, 2005. Many advancements in storm modeling as well as the scientific community's understanding of how storms behave and how they impact storm surge and erosion, contribute to better mapping and depicting the level of risk.

The new FIS for the Town of South Bethany includes an updated analysis of coastal risk from the Atlantic Ocean and inland bays. For the west part of the Town, flooding occurs mostly from inland bays and the 2005 FIRM listed the Base Flood Elevation (BFE¹) at 5 feet within a Zone AE². The results of the new coastal modeling produced a BFE of 6 feet within a Zone AE due to flooding from inland bays, which was depicted on the 2013 preliminary FIRM. For oceanfront homes along Ocean Drive in the east part of the Town, the 2005 FIRM listed the BFE at 12 feet within a Zone VE³. The initial results of the new coastal modeling produced a BFE of 10 feet for oceanfront homes along Ocean Drive, which was depicted on the 2013 preliminary FIRM. The drop in the BFE along the oceanfront from the 2005 FIRM was based on the results from the USACE storm surge study combined with FEMA standard methodologies for determining overland flooding inundation.

In April 2014, a concern was raised that the results depicted on the 2013 preliminary FIRM along the oceanfront, underestimated the real risk and were inconsistent with observed flooding events in the past. This was supported by the Delaware Department of Natural Resources and Environmental Control (DNREC), who supplied information on past flooding events. FEMA determined that a reanalysis was appropriate to adequately account for extensive erosion of the beach during extreme events that were not accounted for in the 2013 preliminary FIRM.

The revised analysis resulted in a Zone VE with a BFE of 13 feet for oceanfront homes along Ocean Drive within the Town of South Bethany. The new information, combined with updated data, models and methodologies explain the changes in BFE from that developed from the analysis depicted on the 2005 FIRM.

¹ The Base Flood Elevation (BFE) is the height in feet above a certain datum, in this case North American Vertical Datum of 1988 (NAVD 88), that flood waters have a 1 percent annual chance of reaching or exceeding in any given year.

² Zone AE in coastal areas is defined by wave heights of less than 3 ft.

³ Zone VE is defined by wave heights of 3 ft. or greater, or by the Primary Frontal Dune (PFD). A PFD is a continuous or nearly continuous mound or ridge of sand with relatively steep seaward and landward slopes immediately landward and adjacent to the beach and subject to erosion and overtopping from high tides and waves during major coastal storms.



Differences in BFEs at the Corporate Limits

The revised analysis results in what appears to be a sharp difference in the VE Zone along the oceanfront at the northern and southern borders of the Town. The BFE is determined from various modeled components, as shown in the Figure 1. SWEL is the stillwater elevation.

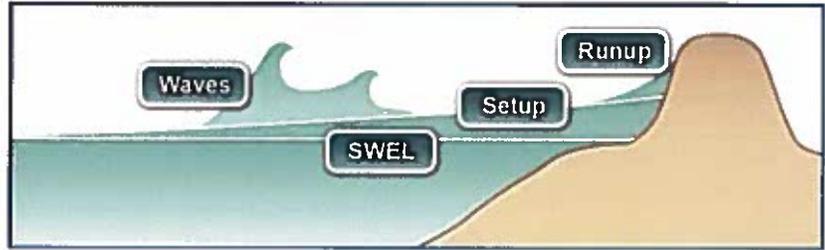


Figure 1

Physical characteristics of Ocean Drive and the terrain along the shoreline affect the magnitude of erosion and runup. Extensive beach erosion within the Town results in significant wave runup, and thus a higher BFE. South of the Town, where the BFE transitions from 13 feet to 10 feet, there is the undeveloped Fenwick Island State Park. The physical characteristics within the park, including milder beach profile slopes along the shoreline, produce modeling results that show less erosion and runup, and therefore a lower BFE, than within the Town.

At the north part of Town, the BFE shifts from 10 feet to 13 feet going south because within the Town, Ocean Drive and the oceanfront houses are closer to the shore, and the terrain is more vulnerable to erosion. Beach profile elevation data in this location both before and after the storm events Ida in 2009 and Sandy in 2012 shows significant erosion and steeper slopes resulting from erosion in the areas where the revised analysis results in a BFE of 13 feet. Figure 2 shows the locations where the BFE transitions between 10 feet and 13 feet along Ocean Drive within the Town.



Figure 2



Past and Current Regulatory Actions

FEMA revised the 2013 preliminary FIRM in August 2014 to account for the revised analysis and to allow for a 30 day comment period. The Town of South Bethany received a Letter of Final Determination (LFD) from FEMA on September 16, 2014 stating that the Special Flood Hazard Areas on the revised August 2014 preliminary FIRM were final and would become effective six months after the LFD, on March 16, 2015. In December 2014, the Town requested more time from FEMA to review and comment on the August 2014 changes.

On February 25, 2015, FEMA rescinded the LFD for the Town of South Bethany. The FIRM for Sussex Countywide will still go into effect on March 16, 2015. However, the SFHA for the Town of South Bethany depicted on the January 6, 2005 FIRMs has been incorporated into panels 100050C514K and 100050C518K for the March 16, 2015 Sussex Countywide FIRM. In other words, there are no changes to the SFHA within the corporate limits of South Bethany between the January 6, 2005 and the March 16, 2015 FIRMs. If there are any recent changes to flood insurance for property owners within the Town, it is not due to the FIRM that becomes effective on March 16, 2015. Figure 3 depicts the history of mapping changes for FIRM 100050C518K.

It is expected that FEMA will issue new FIRM panels for the Town in the future that will reflect updated coastal analyses for the Town. When that happens, a statutory process including a 90 day appeal period will be initiated. New FIRM panels may impact flood insurance rates so it is important that citizens review not only their current policy, but also understand their property’s potential increased risk to flooding. For more information about what homeowners can do and what resources are available, visit <https://www.fema.gov/protecting-homes/coastal-resources-homeowners-renters-business-owners-general-public>.

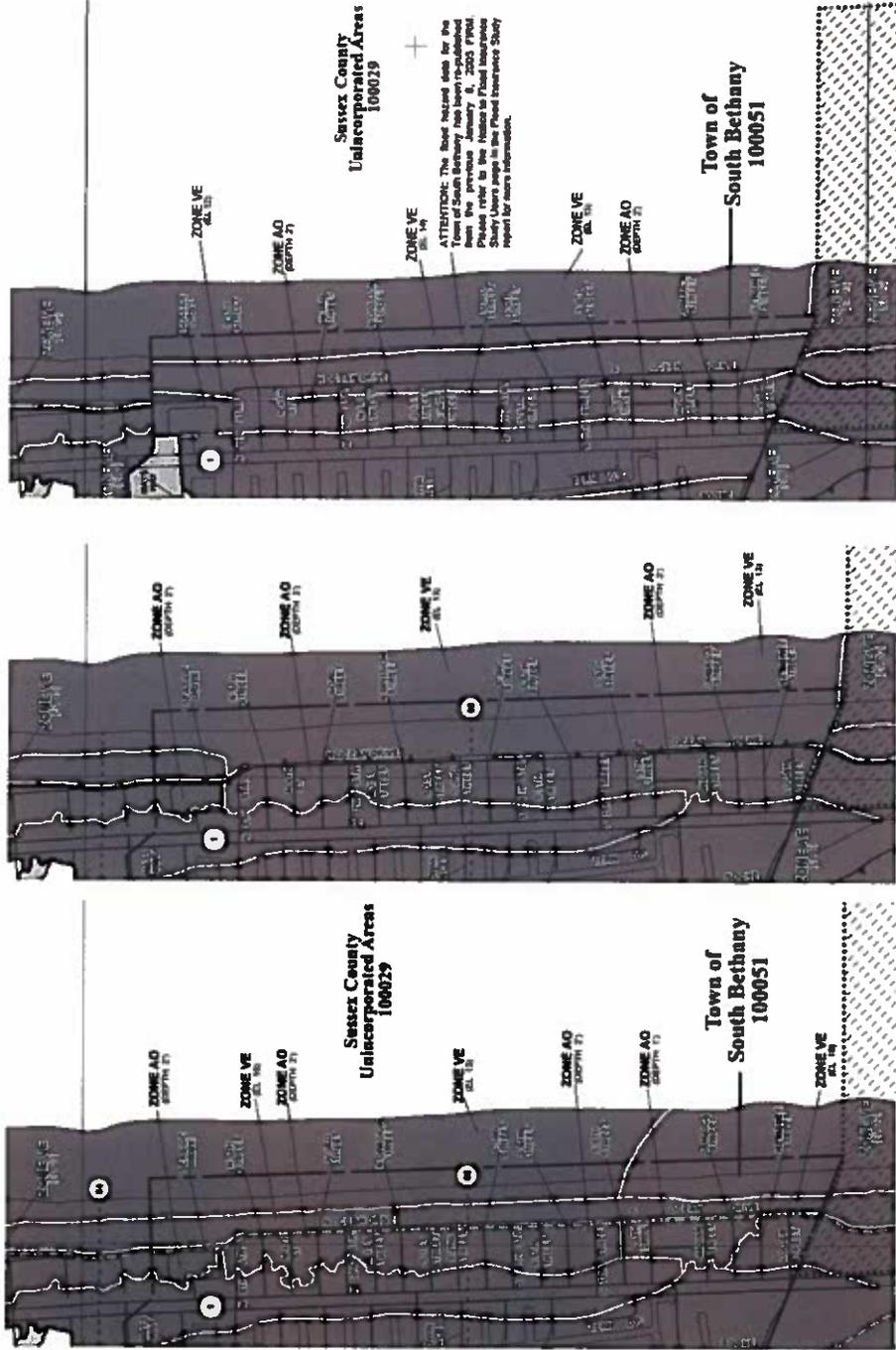
Timeline of Activities to Date

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|---|---------------------------|
| Last Effective Flood Insurance Study Issued for Sussex County | January 6, 2005 |
| Preliminary Issuance for new coastal study | January 31, 2013 |
| Final CCO meeting date | June 19, 2013 |
| Federal Register publication | December 23, 2013 |
| Start of Appeals Period | February 6, 2014 |
| Concern raised and new data received | April 1, 2014 |
| End of Appeals period | May 6, 2014 |
| Preliminary map revised to account for new data received | August 15, 2014 |
| Letter of Final Determination issued | September 16, 2014 |
| Letter of Final Determination rescinded | February 25, 2015 |
| 1/6/2005 mapping added within South Bethany to revise the 3/16/2015 FIRM | March 4, 2015 |
| New Effective date for Sussex County | March 16, 2015 |



FEMA

Changes to the Town of South Bethany FIRM panel 100050C518K



2013 Preliminary FIRM

2014 Revised Preliminary FIRM

March 16, 2015 Effective FIRM

Figure 3

LEGEND

SPECIAL FLOOD HAZARD AREAS (SFHAs) SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AV, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

- ZONE A No Base Flood Elevations determined.
- ZONE AE Base Flood Elevations determined.
- ZONE AO Flood depths of 1 to 3 feet (usually great flow or sloping terrain); average depths determined. For areas of shallow fan flooding, velocities also determined.
- ZONE V Coastal flood zone with velocity hazard (wave action); no Base Flood Elevations determined.
- ZONE VE Coastal flood zone with velocity hazard (wave action); Base Flood Elevations determined.

513 (EL. 047)
 Base Flood Elevation line and value; elevation in feet
 Base Flood Elevation value where uniform within zone
 Referenced to the North American Vertical Datum of 1988

OTHER FLOOD AREAS

ZONE X Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

Areas determined to be outside the 0.2% annual chance floodplain.

- Floodplain boundary
- Floodway boundary
- Zone D boundary
- CRS and CPA boundary
- Boundary dividing Special Flood Hazard Area Zones and Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action prior to 2014
- Limit of Moderate Wave Action after 2014