

922 N. Cleveland St.
Arlington, VA 22201

January 19, 2016

Mr. Jon Janowicz, P.E.
FEMA Regional III Office
615 Chestnut Street
One Independence Mall, Sixth Floor
Philadelphia, PA 19106-4404

Re: Appeal of FEMA's May 2015 preliminary Flood Insurance Rate
Maps for the East Side of Ocean Drive, South Bethany

Dear Mr. Janowicz:

I respectfully submit this appeal of FEMA's May 2015 Preliminary Flood Insurance Rate Map for the east side of Ocean Drive, South Bethany (the "2015 Preliminary FIRM"). As addressed below, the 2015 Preliminary FIRM is scientifically and technically incorrect in a number of respects that result in the 13 foot base flood elevation (BFE) assigned to homes on the east side of Ocean Drive (referred to hereinafter as the "Ocean Drive homes") being incorrect.¹ As also discussed below, the 2013 Preliminary FIRM (defined below), which assigned a BFE of 10 feet to Ocean Drive homes, is scientifically and technically correct.

The impact of the scientific and technical errors in the 2015 Preliminary FIRM and the resulting 13 foot BFE for Ocean Drive Homes is severe. A 13 foot BFE will cause Ocean Drive homeowners to pay flood insurance premiums corresponding to risks far in excess of the actual risks being insured, no doubt resulting in many canceling their flood insurance policies. It will also damage the character of Ocean Drive (known as "The Promenade" and "South Bethany's boardwalk") by, together with a new freeboard ordinance, causing construction to occur at heights that block sunlight, obstruct neighboring homeowners' views, and tower over neighboring homes.²

A. Background

1. ***December 2013 Publication of Preliminary FIRM:*** During December 2013 FEMA published a Preliminary FIRM covering South Bethany as well as neighboring towns and communities, including Bethany Beach, Fenwick Island, the private communities in North Bethany, Dewey Beach, and Rehoboth Beach (the "2013 Preliminary FIRM"). The 2013 Preliminary FIRM applied the same standard and accepted methodologies in determining the BFE for Ocean Drive

¹ All references to "foot" or "feet" are to NAVD.

² Ocean Drive is a narrow, single lane road, which heightens the impact of increased construction heights.

homes as it did for other oceanfront properties in neighboring towns and communities. Under the 2013 Preliminary FIRM, the Ocean Drive homes were determined to have a BFE of 10 feet, which was a two foot reduction from the prior 2005 FIRM (which applied older and less developed coastal mapping methodologies). This reduction in BFE was consistent with reductions in BFEs for oceanfront homes in adjacent towns and communities, substantially all of which were reduced from 12 feet (most to ten feet or less, with some being moved out of the VE Zone). The 2013 Preliminary FIRM was the culmination of a rigorous process undertaken by FEMA and its mapping partner RAMPP that included, among other things, at least one site visit to South Bethany by RAMPP, extensive review by the U.S. Army Corps of Engineers (specifically including the erosion methodologies applied), and extensive review and consultations with the Delaware Department of Natural Resources and Environmental Control (DNREC).

2. ***April 1, 2014 Email From South Bethany Town Council Member:*** During April 2014, a South Bethany Town Council member sent an email to FEMA stating, among other things, that the BFE for Ocean Drive homes should not be reduced from 12 feet to 10 feet, but rather should remain at 12 feet (the “April 2014 Email”). The April 2014 Email included news clippings (annotated by the Town Council member) of prior storm damage along Ocean Drive dating back now twelve or more years, an email from DNREC referring to prior “repetitive loss” properties, information reflecting the current elevation of Ocean Drive at various points, and a “tide reference” for Bethany/South Bethany.
3. ***FEMA Treats the April 2014 Email as an Appeal Under 44 CFR Part 67 and Increases the BFE for Ocean Drive Homes to 13 Feet:*** In what appears to have been an effort to accommodate what FEMA believed to be a request on the part of the Town of South Bethany that the BFE for Ocean Drive homes be increased, FEMA treated the April 2014 Email an “appeal” under its regulations and revised the 2013 Preliminary FIRM to increase the BFE for Ocean Drive homes to 13 feet (as revised, the “Revised 2013 Preliminary FIRM”).³ The Revised 2013 Preliminary FIRM became final on September 16, 2015, with FEMA issuing a Letter of Final Determination on that date. No notice was ever provided to Ocean Drive homeowners of the April 2014 Email, FEMA’s treating the April 2014 Email as an “appeal”, FEMA’s amendment of the 2013 Preliminary FIRM to increase the BFE of Ocean Drive homes to 13 feet, or the Revised 2013

³ I do not address in this appeal the whether the April 2014 Email in fact qualified as an appeal under FEMA’s regulations.

Preliminary FIRM becoming final.⁴ The Revised 2013 Preliminary FIRM that became final on September 16, 2015 is herein referred to as the "2014 Final FIRM".

4. ***December 2014 Letter From the Town of South Bethany to FEMA:*** The Town of South Bethany sent a letter to FEMA, dated December 15, 2014, in which it stated, among other things, that the April 2014 Email was not an appeal by or on behalf of the town and that the April 2014 Email did not constitute an appeal under FEMA's regulations (44 C.F.R., Part 67). The Town of South Bethany also requested that all materials submitted with respect to the April 2014 Email be removed from the administrative record.
5. ***FEMA Revokes the 2014 Final Firm With Respect to South Bethany During February 2015:*** On February 25, 2015, FEMA rescinded the South Bethany portion of the 2014 Final FIRM and substituted in its place the BFEs for South Bethany that were in place under the 2005 FIRM. As a result, the BFEs for South Bethany from the 2005 FIRM were included in the Sussex County FIRM that became effective on March 16, 2015.
6. ***During May 2015 FEMA Proposes a New Preliminary FIRM for South Bethany:*** On May 18, 2015 FEMA proposed a new preliminary FIRM for South Bethany (the "2015 Preliminary FIRM") that used the same analysis and assigned the same 13 foot BFE to Ocean Drive homes as under the Revised 2013 Preliminary FIRM.
7. ***March 2015 Freedom of Information Act (FOIA) Request Submitted to FEMA.*** On March 30, 2015, the undersigned submitted a FOIA request to FEMA (which was submitted in accordance with directions provided by a senior official in FEMA's Region III Philadelphia office) requesting information that would allow evaluation of the basis for the change in BFE from 10 feet to 13 feet, including all documentation relating to the reasons for any changes in the erosion analysis. FEMA has yet to provide to the undersigned any of the requested information. A copy of the FOIA request is attached as Exhibit A to this letter (referred to herein as the "March 2015 FOIA Request").⁵

⁴ Notice was provided after the Revised 2013 Preliminary FIRM became final.

⁵ Fortunately, after filing a FOIA request with South Bethany at the end of 2015, I was able to obtain some of the information requested in the March 2015 FOIA Request I filed with FEMA. This has allowed me to file this appeal, albeit without having the full information desired to prepare the appeal.

8. **June 2015 FEMA Presentation at Public Meeting at Town of South Bethany Town Hall (the "June 12, 2015 FEMA Meeting"):** On June 12, 2015, FEMA, AECOM-RAMPP, and the U.S. Army Corps of Engineers participated in a presentation organized by FEMA that addressed, among other things, FEMA's changed analysis from the 2013 Preliminary FIRM to the 2015 Preliminary FIRM. Among the participants in the presentation were Jon Janowicz, Risk Analysis Branch Chief, FEMA Region III; Christine Worley, Senior Project Manager, AECOM - RAMPP (FEMA Mapping Contractor); Heather Zhao, Project Manager, AECOM - RAMPP; and Jason Miller, Chief, Flood Plain Management Services Branch, U.S. Army Corps of Engineers. In connection with the presentation, FEMA provided handout materials (the "FEMA Explanation Materials") that identified the following as "New Data received After 2013 Preliminary FIRM":

- Surveyed elevation data for Ocean Drive and Route 1 within the Town limit, and other areas within the Town, collected in 2013 and 2014
- Historic photographs of damage caused by storm events in the area of Ocean Drive
- Beach elevation profiles surveyed by the USACE before and after the storm events Ida in 2009 and Sandy in 2012
- Repetitive loss information for properties along Ocean Drive showing damage above 12 feet
- Historic newspaper articles recounting storm damage

The FEMA Explanation Materials (attached as Exhibit B) also described FEMA's "Standard Erosion Analysis" (dune erosion based on 540 square foot rule) and included the following text in a section entitled "Revised erosion analysis (Tr. 1600 as an example)"⁶:

2013 Prelim: toe set at the 10 yr SWEL elevation and standard removal slope of 1:50. Treated as removal case — creating mild slope after erosion.	Revised: toe was lowered to elevation of 1.1 ft. Erosion profile was modified to be consistent with survey and observation. Treated as retreat case- creating steep slope after erosion.
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⁶ Substantially identical materials were provided by FEMA at the final CCO meeting on May 21, 2015.

B. Basis for Appeal

The analysis upon which the 2015 Preliminary FIRM is based is scientifically and technically incorrect in a number of substantial respects that result in the 2015 Preliminary FIRM being incorrect for the transects for which FEMA increased the BFE for Ocean Drive homes to 13 feet (the "South Bethany transects"). In contrast, the analysis upon which the 2013 Preliminary FIRM is based (and the methodologies used in the analysis underlying it) are scientifically and technically correct and resulted in the 2013 Preliminary FIRM being correct and accurate for the South Bethany transects. This appeal submits the 2013 Preliminary FIRM (assigning a BFE of 10 feet to Ocean Drive homes) and the analysis upon which it was based as being scientifically and technically correct and as setting forth the correct BFEs for Ocean Drive homes. FEMA is in possession of the study for the 2013 Preliminary FIRM (including the technical information and methodologies underlying). For convenience, I have attached discs that include the 2013 Preliminary FIRM information.

1. *Analysis Underlying the 2105 Preliminary FIRM, Generally:*

Unfortunately, the specific analysis that FEMA used and relied upon in formulating the 2015 Preliminary FIRM and the scientific and technical basis for it is unclear and lacks sufficient documentation. Demonstrating the lack of clarity and apparent confusion among FEMA personnel with respect to the analysis underlying the 2015 Preliminary FIRM, the Technical Support Data Notebook for the 2015 Preliminary FIRM (dated October 16, 2014) (the "Technical Support Notebook") states, in part, on page 8 under the caption "Unique Erosion Methodology Applied in the Town of South Bethany" as follows:

[T]he preliminary model was revised to have the dunes completely erode while Ocean Drive was kept intact due to the fact that Ocean Drive was built with non-erodible materials. Keeping the Ocean Drive intact was consistent with observations made by State and Local officials after historic storm events. New overland wave height analysis and run-up analysis were conducted with these conditions in place that resulted in revised SFHAs within the Town.

In contrast, however, the FEMA Explanation Materials (described above) state that the dune was a "retreat case - - creating steep slope after erosion" (rather than a "removal case"). In addition, the FEMA Explanation Materials do not make any mention of Ocean Drive or its being kept intact or treated as non-erodible as being part of the erosion and run-up analysis for the 2015 Preliminary FIRM. Moreover, the audio recording for the June 12, 2015 FEMA Meeting reflects that neither FEMA nor RAMPP made any mention of (a) Ocean Drive or its being treated as non-erodible as being part of the erosion and run-up analysis or (b) dune removal or retreat. This lack of clarity and/or confusion on the part of FEMA personnel, use of widely divergent non-standard methodologies and analyses for the 2015 Preliminary FIRM, and FEMA's failure to comply with the March 2015 FOIA request, have made it difficult to

understand and evaluate how FEMA scientifically and technically supports discarding the 10 foot BFE for Ocean Drive homes (which was the product of a comprehensive, well-documented multi-year process that included multiple layers of review, including detailed review by the U.S. Army Corps of Engineers and DNREC) in favor of a dramatically higher BFE of 13 feet for Ocean Drive homes that was decided upon in a matter of weeks during 2014 without any notice to Ocean Drive homeowners or the careful process utilized in establishing the 10 foot BFE.

Following is a discussion of why the nonstandard analysis that appears to underlie the 2015 Preliminary FIRM is scientifically and technically incorrect (resulting in the 2015 Preliminary FIRM being flawed and incorrect) and why the analysis underlying the 2013 Preliminary FIRM is scientifically and technically correct (resulting in the 2013 Preliminary FIRM being correct and accurate).

2. *Dune Removal or Retreat; Dune Toe; Erosion; Treatment of Ocean Drive*

The analysis for the 2013 Preliminary FIRM treated the dunes in the South Bethany transects as a removal case. The 2005 LiDAR topography reflects that the dunes present in the relevant transects were small and had a low profile that did not meet the 540 square foot rule (described below).⁷ As a result, the dunes were correctly treated as a removal case.⁸ This treatment follows the standards set forth in FEMA's *Atlantic Ocean and Gulf of Mexico Coastal Guidelines Update (February 2007)* (the "FEMA Mapping Guidelines") and was scientifically and technically correct.

With respect to the treatment of a dune as a removal or retreat case, the FEMA Mapping Guidelines provide as follows:

To prevent dune removal during the 1-percent-annual-chance storm, the frontal dune reservoir must typically have a cross-sectional area of at least 540 square feet (or 20 cubic yards volume per foot along the shore) above the 1-percent-annual-chance SWEL without wave setup (FEMA, September 1986; FEMA, November 1988). . . .If a dune has a frontal dune reservoir less than 540 square feet in cross-sectional area, storm- induced erosion can be expected to obliterate the existing dune with sand transported both landward and seaward. Determining the dune reservoir requires an assessment of the profile area located above the 1-percent-annual-chance still-water flood level and seaward of the crest of the primary dune. . . . *Where the frontal dune*

⁷ In preparing this appeal, the undersigned has relied upon, and assumed the accuracy of, FEMA's LiDAR, topographical and similar-type data that remained unchanged between the 2013 Preliminary FIRM and the 2015 Preliminary FIRM.

⁸ It appears that for certain South Bethany transects, FEMA did not identify any dune so no dune removal/erosion methodology was applied (since there was no dune to remove/erode).

reservoir is less than 540 square feet, construction of the eroded profile is extremely simple: dune removal is effected by means of a seaward-dipping slope of 1:50 running through the dune toe. [Emphasis added]

Page 6 of the FEMA Explanation Materials (Exhibit B) reflects how the dune removal or retreat determination is made. Exhibit C also reflects how the dune removal or retreat determination is made as well as application of the 1:50 erosion slope for removal. As noted above, FEMA and RAMPP have been inconsistent in their statements regarding whether the dunes present in South Bethany were treated as a removal or retreat case for the analysis underlying the 2015 Preliminary FIRM. To the extent they were treated as a retreat case, such treatment is scientifically and technically incorrect since there is no plausible analysis under which to the 540 square foot rule would be met and there is no scientific, technical, or other basis that supports deviation from the 540 square foot rule.

The analysis underlying the 2015 Preliminary FIRM is also scientifically and technically incorrect with respect to its determination of the toe of the dunes for South Bethany and the erosion methodology it applied. Section D.2.9.3.1.1 of the FEMA Mapping Guidelines provides as follows:

Construction of an eroded profile focuses on the usually distinct feature termed the dune toe. The dune toe is taken to be the junction between the relatively steep slope of the front duneface and the notably flatter seaward region of the beach or the back-beach berm (including any minor foredunes). If a clear slope break is not apparent on a given coastal transect, its location should be taken at the typical elevation of definite dune toes on nearby transects within the study area. Alternatively, the dune toe may be set at the local 10-percent SWEL, which has been shown to be an adequate approximation along the Atlantic and Gulf coasts. In every case, the dune toe must be taken at an elevation above that of any beach berms on local shores. [Emphasis added]

The analysis underlying the 2015 Preliminary FIRM established the dune toe for transect 1600 at 1.1 feet (and at similar levels for other South Bethany transects).⁹ This departs to an extreme degree from accepted standards used in establishing the toe of a dune and the FEMA Mapping Guidelines, which direct that if the slope break is unclear (which FEMA presumably believes to be the case here or there would have been no change from the 2013 Preliminary FIRM), the toe be set at the 10% SWEL (more than 6 feet in the case of the South Bethany transects) or be determined by reference to adjacent transects (the toe for the adjacent transects to

⁹ As previously noted, it appears that FEMA did not identify any dune in the 2013 Preliminary FIRM study for certain South Bethany transects. Thus, it is unclear how FEMA created a dune toe for those transects for the 2015 Preliminary FIRM.

the north (1590) and south (1650) are five feet higher than what FEMA assigned to the South Bethany transects). Moreover, the dune toes established by FEMA for the 2015 Preliminary FIRM are not even above the elevation of beach berms on local shores. Because the determination of the toe of a dune is primarily based on observational data (here the 2005 LiDAR topography that remained unchanged between the dates of the 2013 Preliminary FIRM and the 2015 Preliminary FIRM), it is fair to expect that there would be complete consistency (or at least a high degree of consistency) in determinations of the dune toes for the 2013 Preliminary FIRM and the 2015 Preliminary FIRM. No scientific or technical explanation was provided by FEMA as how the elevation of the dune toe could drop to such an extreme degree. FEMA's use of the dramatically lower dune toe for the 2015 Preliminary FIRM allowed it to create a steep slope after erosion that it then used as the basis to apply the TAW method for wave run-up, thereby resulting in a 30% increase in the BFE for the Ocean Drive homes to 13 feet.¹⁰

The dune toes that were established for the 2013 Preliminary FIRM were determined in a manner consistent with the FEMA Mapping Guidelines and standard methodology (which, for example, yielded 6.6 feet for transect 1600), were scientifically and technically correct and reflective of actual conditions.

The standard dune analysis and related erosion methodologies applied for the 2013 Preliminary FIRM are scientifically and technically correct and are superior to those used for the 2015 Preliminary FIRM since they are consistent with the FEMA Mapping Guidelines, the treatment of adjacent beaches with highly similar profiles, and actual conditions.

As noted above, although FEMA did not mention Ocean Drive in its FEMA Explanation Materials or at the June 2015 FEMA Meeting, the Technical Support Notebook for the 2015 Preliminary FIRM states that Ocean Drive was kept intact for erosion analysis purposes "due to the fact that Ocean Drive was built with non-erodible materials". No support is provided for this conclusion, even though it is contrary to the photos of historic storm damage that FEMA points to as "new data".

3. ***The New Data That FEMA Points to Is Clearly Insufficient to Support Overturning the Use of the Standard Methodologies Applied to South Bethany in the 2013 Preliminary FIRM and For Adjacent Beaches in the 2014 Final FIRM.***

As noted above, as support for use of the nonstandard methodologies for South Bethany in the 2015 Preliminary FIRM, FEMA pointed to the following "new data" as being received

¹⁰ The scientifically and technically incorrect erosion profile that FEMA appears to have used appears to have the configuration of duneface retreat, yet it does not follow any of the standard FEMA guidelines for dune retreat, including balancing of the eroded sediment volume across the seaward portion of the profile.

after publication of the 2013 Preliminary FIRM: beach elevation profiles before and after Ida in 2009 and Sandy in 2012; historic photos and new accounts of storm damage in South Bethany; survey data for Ocean Drive and elsewhere in South Bethany; and repetitive loss information for properties along Ocean Drive. None of this data is of the type, reliability, or sufficiency to justify the use of non-standard methodologies for the 2015 Preliminary FIRM instead of the standard methodologies used for the 2013 Preliminary FIRM and for all neighboring beaches. Reflecting that this "new data" is lacking as a basis for the use of non-standard methodologies, most all of it, as discussed below, was already in FEMA's possession or was readily available to FEMA (if FEMA thought it was at all material) when FEMA prepared the 2013 Preliminary FIRM using standard methodologies and analyses for South Bethany.

FEMA's relying on the erosion data relating to the post-replenishment beach after Ida and Sandy to support a widely deviating, non-standard erosion analysis for the 2015 Preliminary FIRM lacks scientific justification. The 2005 beach had a mild slope and small dunes. The post-replenishment beach has a much steeper slope and a large dune. As result, how the replenished beach erodes in a major storm does not provide instruction as to how the fundamentally different 2005 beach would erode. Moreover, the beaches and dunes in Bethany Beach and other neighboring beaches eroded in the same or similar ways as in South Bethany, reflecting that South Bethany does not have an atypical type of erosion that requires the abandonment of standard methodologies. Further reflecting this, since the time of the original replenishment project during 2007/2008, Bethany Beach needed and received an additional maintenance replenishment that was not needed by, or provided to, South Bethany. Yet, while standard erosion methodologies were correctly used by FEMA for Bethany Beach and elsewhere, an aggressive, widely deviating non-standard method was used in South Bethany for the 2015 Preliminary FIRM.¹¹

Attached as Exhibit D is a survey and related photos reflecting the following information for (a) 302 N. Ocean Drive, South Bethany (my home), (b) the "Ocean 8" townhouses adjacent to Campbell Place in Bethany Beach, and (c) the Ocean Hamlet condominiums in Tower Shores North Bethany, all as of January 4, 2016: location of the shoreline, toe of the dune, ridge of the dune, and location of the residential structures. The beach and dune profiles reflect their current state following a major storm that hit the Delaware shore during early October 2015. As reflected by the survey and photos, all three locations show similar dune scarping, although because the Tower Shores location has a much smaller dune, the vertical height of the scarping is much lower. The location of the peak erosion point of the dunes is approximately 143 feet from the residential structure at 302 N. Ocean Drive, 105 feet from the residential structure in Bethany Beach, and 45 feet residential structure in Tower Shores. Thus, the storm erosion reached much closer to the Bethany Beach and Tower Shores residential structures than the South Bethany

¹¹ The Final 2014 FIRM properly applied standard methodologies to Bethany Beach and elsewhere, and no objection is made herein to such treatment.

structure. The Bethany Beach and Tower Shores residential structures are also substantially closer to the shoreline than the South Bethany residential structures (approximately, 255 feet for Bethany Beach, 210 feet for Tower Shores, and 305 feet for South Bethany).

It is also important to note that RAMPP visited South Bethany, Bethany Beach, and other neighboring beaches less than ten days after Ida, so it saw first-hand the erosion that occurred in South Bethany and elsewhere from Ida. Thus, RAMPP and FEMA were well aware of the storm erosion profiles of South Bethany, Bethany Beach, and elsewhere after Ida and obviously would have taken this information into account in developing the 2013 Preliminary FIRM for South Bethany and neighboring communities.

With respect to photos and new accounts of historic storm damage in South Bethany, FEMA, DNREC, and RAMPP were all well aware of storm damage in South Bethany and neighboring towns when preparing the 2013 Preliminary FIRM. Attached as Exhibit E is February 2013 email correspondence among DNREC and RAMPP members URS and Dewberry in which DNREC provides comments on BFEs along the shoreline and other mapping issues in Rehoboth, Dewey, North Bethany, Bethany Beach, South Bethany, and Fenwick Island. The emails also include photos of extensive storm damage in each these towns after historic storms. For each of these communities, DNREC notes, among other things, that during the historical storms that "likely did not exceed 1% return criteria" the ocean flowed over the dunes and across coastal highway (Route 1). The emails reflect that historic storm damage information was fully considered as part of the process of developing the 2013 Preliminary FIRM for all of the beach communities. Despite the ocean flowing over dunes and across Route 1 during historic storms, FEMA reduced the BFEs of numerous oceanfront properties in Fenwick Island and elsewhere to 9 feet or less and appears to have moved some oceanfront homes out of the VE zone. As a more general matter, local news accounts of storms and related damage are inherently lacking in reliability and certainly do not provide the type of objective and reliable information that can reasonably be relied upon by FEMA to justify the use of nonstandard methodologies for the 2015 Preliminary FIRM.

With respect to information relating to recurring loss properties in South Bethany, it does not provide either clear or reliable information that can be used in support of the use of nonstandard methodologies. Federal flood insurance covers, among other things, stairways, pilings, support structures, and other items that may be located in whole or in part below a structure's elevation. As a result, claims can be filed and paid for damage to property that is located well below the elevation of the property. Moreover, the impact of the generally poor construction quality of many older Ocean Drive homes is unknown and whether flood damage may have occurred from inundation on the landward side of a property is unknown.

It is unclear what significance FEMA attached to the current elevation data for Ocean Drive that it points to as "new data" (but which was certainly readily available at the time of the 2013 Preliminary FIRM was prepared). To the extent that FEMA believes it to be relevant in

evaluating photos of historic storm damage, it appears that, among other things, FEMA has not made any assessment as to whether the elevation of all or portion of Ocean Drive may have been either higher or lower at the time of historic storms.

In connection with evaluating historic storm-related information, the evolving nature of beaches must be considered. A DNREC publication entitled "Striking a Balance, A Guide to Coastal Dynamic and Beach Management (second edition, 2004) addresses this on page 29, stating as follows:

The dynamic nature of coastal environments results in an ever-changing shoreline—cycles of erosion and sand accumulation over both long and short time frames in any one location. Although these cycles of erosion and accumulation are often reported in terms of average long-term trends, fluctuating periods of stability and change may occur over a period of days, weeks, months, or years. For example, in the Fenwick Island area, a section of coast that had been rather stable for many years was impacted by rapid and unexpected change. DNREC survey records show that over the 2-year span from 1977-1979, the Delaware shoreline moved landward at an average rate of more than 30 feet each year, resulting in a permanent displacement of over 60 feet at the end of the 2-year cycle. Similar changes were observed in Dewey Beach and in Rehoboth, where a beach that had been stable for decades experienced a period of rapid change. Although the exact cause of these quick changes in erosion rates has not been determined, many of these beaches did return to more average annual rates of erosion following these short cycles of rapid change.

The clear evidence is that South Bethany does not suffer from any type of unique storm erosion that warrants the application of nonstandard methodologies. Reflecting this, going back for the most readily observable period of seven plus years since the USACE replenishment project in South Bethany and Bethany Beach, South Bethany's beach has fared at least as well as Bethany Beach's beach (where standard erosion methodologies were correctly used by FEMA). As noted above, since the time of the original replenishment project during 2007/2008, Bethany Beach needed and received an additional maintenance replenishment that was not needed by, or provided to, South Bethany.¹² In addition, as discussed above, the survey and related photos attached as Exhibit D also support the fact that South Bethany does not suffer from unique erosion

¹² Although the initial and follow-on USACE replenishments provided in South Bethany and Bethany Beach were reviewed at the June 12, 2015 FEMA Meeting, no mention was made of the additional follow-on maintenance replenishment provided to Bethany Beach but not needed by, or provided to, South Bethany. As a result, it is unclear whether FEMA was aware of this information at the time it revised the 2013 Preliminary FIRM to increase the BFE for Ocean Drive homes to 13 feet.

that requires the abandonment of standard methodologies.

C. The 2015 Preliminary FIRM Improperly Excludes South Bethany's Post 2007/08 Dune and Replenished Beach

As separate grounds for appeal of the 2015 Preliminary FIRM (and independent of the appeal set forth above), FEMA incorrectly excluded the post-2007/08 dune and replenished beach in South Bethany in preparing the 2015 Preliminary FIRM.

1. ***The Post-2007/08 South Bethany Dune Was Incorrectly Excluded From FEMA's Analysis for the 2015 Preliminary FIRM:*** 44 CFR 65.11(a) provides that dunes are taken into account in determining flood risks except for "artificially designed and constructed dunes that are not well-established with long-standing vegetative cover, such as the placement of sand materials in a dune-like formation." 44 CFR 65.11(c) goes on to provide that "[e]xceptions to the evaluation criterion may be granted where it can be demonstrated through authoritative historical documentation that the primary frontal dunes at a specific site withstood previous base flood storm surges and associated wave action."

The South Bethany dune has been in place for eight years with continuous vegetative cover since the time that dune grass was planted on it during spring 2008. In addition, the dune has withstood numerous nor'easters, as well as Hurricane Sandy, without ever coming remotely close to being breached or over-run by waves (other than at a very small section adjacent to the state park). One of these storms, dubbed "Nor'Ida", occurred during November 2009 and was described by Tony Pratt of DNRC as one of the three worst storms during the past 30 years. In a news account of the storm, Mr. Pratt stated that the "beaches were pounded for three days by 23- to 25-foot waves, with one wave hitting 27 feet, as measured by an offshore National Oceanic and Atmospheric Administration buoy." (Cape Gazette, November 22, 2009). Accordingly, the dune should have been taken into account by FEMA.

2. ***The Protection Afforded by the Replenished South Bethany Beach Was Incorrectly Excluded in Determining BFE:*** Although FEMA has promulgated a regulation addressing when an engineered dune is taken into account in preparing FIRMs (44 CFR 65.11), there is no regulation addressing replenished beaches. In response to my inquiry during late 2014 as to the legal authority for FEMA's exclusion of South Bethany's beach replenishment in establishing BFEs, FEMA directed me to Section D.2.1.2.5 of FEMA's publication "Atlantic Ocean and Gulf of Mexico Guidelines Update" (February 2007), which states that "current FEMA policy" is to not consider the effects of beach renourishment projects. Section D.2.1.2.5 further provides that "[i]f it is determined that beach nourishment will likely affect flood insurance risk zones or BFEs, the Mapping

Partner should contact the FEMA Study Representative to determine whether an exception to the current FEMA policy should be considered.”

As an initial matter, FEMA’s policy with respect to replenished beaches is not a regulation and is not entitled to any legal weight. During a November 21, 2014 conference call with FEMA, I was advised that FEMA’s basis for its policy is a National Academy of Science’s report. The report FEMA was referring to appears to be “Beach Nourishment and Protection” (1995). The report states in its “recommendations” section, the following:

A beach nourishment program located seaward of upland buildings or infrastructure provides storm damage reduction relative to the level of protection that would exist if there were no program. Adequate methods exist for approximating the damage reduction owing to a beach nourishment program; however, there is significant uncertainty about the frequency of storm conditions that could compromise project performance. Nevertheless, the increase in the level of protection provided by beach nourishment projects and programs supports a finding of reduction in flooding risk, which would merit a reduction in insurance premiums.

RECOMMENDATION: The Federal Emergency Management Agency should weigh the effect of an adequately designed, constructed, and maintained beach nourishment program on flooding risk and hence on flood insurance premiums.

South Bethany’s replenishment project was carefully designed by the Army Corps of Engineers Common and carries a 50-year commitment from the Army Corps of Engineers to maintain it. Common sense dictates that it provides a high level of protection to oceanfront homes in South Bethany and should be taken into account in determining the BFE for oceanfront homes in South Bethany. Reflecting the protection provided by the replenishment, Tony Pratt of DNREC stated, when asked during March 2012 about what would happen if another 1962 Ash Wednesday storm (a 1% storm) were to hit the area, that “[t]here would be very little damage on the beach side.”

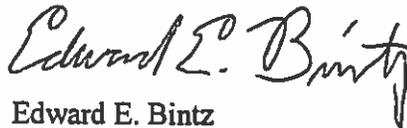
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Please let me know if you have any questions regarding this submission. Please note that in light of FEMA’s failure to provide me with the information I requested in the March 2015 FOIA Request, I hereby reserve the right to amend or supplement this submission. I also fully

Mr. Jon Janowicz, P.E.
January 19, 2016
Page 14

reserve my rights to enforce in federal court or otherwise FEMA's compliance with its FOIA obligations and to pursue any and all remedies I may have in federal court, including under the Administrative Procedure Act (5 U.S.C. §701 - 708), relating to the 2015 Preliminary FIRM.

Sincerely,

A handwritten signature in cursive script that reads "Edward E. Bintz". The signature is written in black ink and is positioned above the printed name.

Edward E. Bintz

FOIA Request

Ed Bintz

Sun 3/29/2015 10:53 PM

To: FEMA-FOIA@dhs.gov <fema-foia@dhs.gov>;

By Email and Certified Mail

Contact Information:

Edward E. Bintz
922 N. Cleveland St.
Arlington, VA 22201
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Email: vze3wycc@outlook.com

FOIA Request:

Please provide to me the information identified below. Please send the requested information to me by email at the email address identified above (requesting receipt acknowledgment) or if not possible to send by email, please send to me at the address identified above. Time is of the essence, so please provide the information as soon as possible and inform me immediately if there is any deficiency in this request. In addition, please provide the requested information as it is retrieved rather than waiting for all of it to be retrieved before responding to this request. If you have any questions relating to this request, please call me or email me. Finally, please let me know if there is any charge for any of the information requested and I will promptly arrange payment.

1. Preliminary FIRMS for South Bethany, DE: For (a) the 2013 preliminary FIRM for South Bethany, DE (reflecting a Base Flood Elevation (BFE) of 10 feet for oceanfront properties on Ocean Drive) and (b) the subsequent August 2014 preliminary FIRM for South Bethany, DE (reflecting a BFE of 13 feet for oceanfront properties on Ocean Drive), please provide the following information:
 - a. Base Topography: The source and date of the base topography used in preparing each preliminary FIRM for each transect affecting properties on the east or west sides of Ocean Drive in South Bethany.
 - b. Erosion Analysis: The inputs and assumptions used for the erosion analysis for Ocean Drive properties for both the 2013 preliminary FIRM and the 2014 preliminary FIRM, including the existence, location and extent of any primary frontal dune taken into account and whether the "retreat" or "remove" erosion analysis was used. Also provide all documentation relating to the reasons for any changes in the erosion analysis from the 2013 preliminary FIRM to the 2014 preliminary FIRM.
 - c. Overland Wave Modeling: The inputs and assumptions used for running FEMA's WHAFIS model, determining stillwater elevations (SWELS), wave height periods, wave set-up, wave run-up, and over-topping, as used for the 2013 preliminary FIRM and the 2014 preliminary FIRM. Also provide all documentation relating to the reasons for any changes in overland wave modeling from the 2013 preliminary FIRM to the 2014 preliminary FIRM.
2. Correspondence and Other Documents Relating to (a) Changes From the 2013 Preliminary FIRM for South Bethany DE to the 2014 Preliminary FIRM for South Bethany, DE and (b) FEMA's Revocation of the Letter of Final Determination For the

South Bethany FIRM on February 25, 2015: Please provide copies of all memoranda, correspondence (including emails), and other documents relating to (a) the changes from the 2013 preliminary FIRM for South Bethany for Ocean Drive to the 2014 preliminary FIRM for Ocean Drive and (b) the revocation of the Letter of Final Determination for the South Bethany FIRM, including internal FEMA email and other correspondence, email and other correspondence with FEMA mapping partners (including RAMPP), the Army Corps of Engineers, the Delaware Natural Resources Commission, Sussex County, DE, and the Town of South Bethany. Please also provide any logs or other records relating to telephone calls or meetings relating to the foregoing.

3. **Final FIRMS for Coastal Towns and Communities in Sussex County DE:** For the Town of Bethany Beach, Town of Fenwick Island, Town of Dewey Beach, and the private communities of Sandpiper Village (in South Bethany), Middlesex Beach, Sea Colony, Tower Shores, Cotton Patch Hills, Bayberry Dunes, the Curves (in Fenwick Island), and Indian Beach, please provide the following:
 - a. **Base Topography:** The source and date of the base topography used in preparing the FIRM for each transect for oceanfront properties.
 - b. **Erosion Analysis:** The inputs and assumptions used for the erosion analysis, including the existence, location and extent of any primary frontal dune and whether the "retreat" or "remove" erosion analysis was used.
 - c. **Overland Wave Modeling:** The inputs and assumptions used for running FEMA's WHAFIS model, determining stillwater elevations (SWELS), wave height periods, wave set-up, wave run-up, and over-topping.

I have not submitted this request to more than one Department component.

Effective vs. New Coastal Study

Coastal Study Component	Effective Study (1995 carried over to 2005)	New Study (2015)
Topographic data	1984 U.S. Department of Interior topo maps	March 2005 2 meter LIDAR data
Coastal methodology guidance used	FEMA Guidance from 1984-1989.	FEMA G&S, Appendix D, Atlantic and Gulf of Mexico Coastal Guidelines Update, dated 2007
SWELs	1991 USACE study using NOAA tide gage data at Lewes station	2012 USACE study using ADCIRC
Modeled transects	42	321
Dune erosion	Yes	Yes
Wave setup and height analysis	Yes (using ACES or the Atlantic Coastal Hindcast Manual, 1981)	Yes (using SWAN and WHAFIS 4.0)
Wave runup	Yes	Yes (Taw)
LIMWA	No	Yes



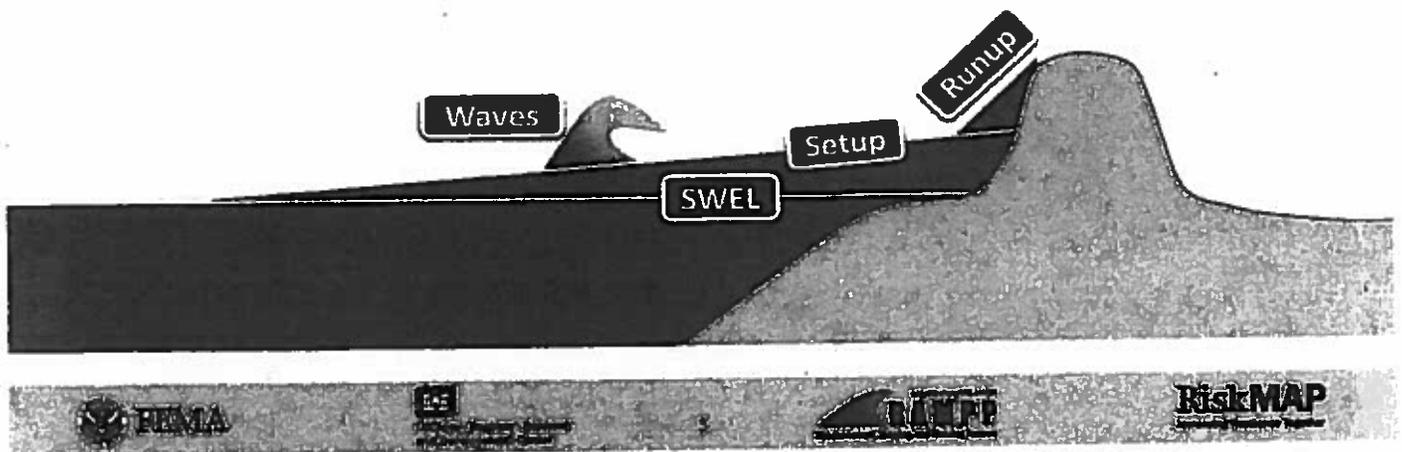
Coastal Study Process



Basic Elements of a Coastal BFE

Base Flood Elevation on FIRM includes 4 components:

1. Storm surge stillwater elevation (SWEL)
2. Amount of wave setup
3. Wave height above storm surge (stillwater) elevation
4. Wave runup above storm surge elevation (where present)



New Data received After 2013 Prelim Issuance

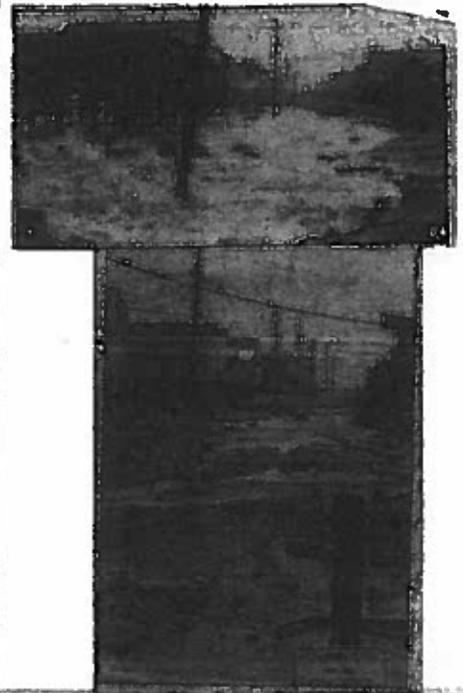
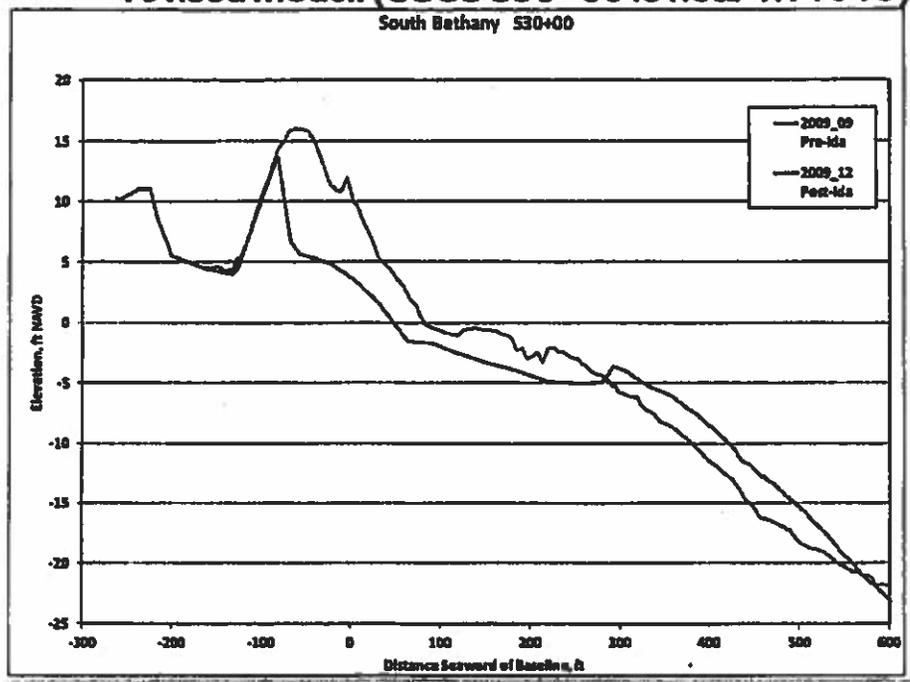
The additional data included:

- surveyed elevation data for Ocean Drive and Route 1 within the Town limit, and other areas within the Town, collected in 2013 and 2014
- historic photographs of damage caused by storm events in the area of Ocean Drive
- beach elevation profiles surveyed by the USACE before and after the storm events Ida in 2009 and Sandy in 2012
- repetitive loss information for properties along Ocean Drive showing damage above 12 feet
- historic newspaper articles recounting storm damage



Pre- and post-storm survey data in South Bethany

□ Eroded profile shows significant retreat after storm and consistent with revised model. (USGS S30+00 is near Tr. 1610)



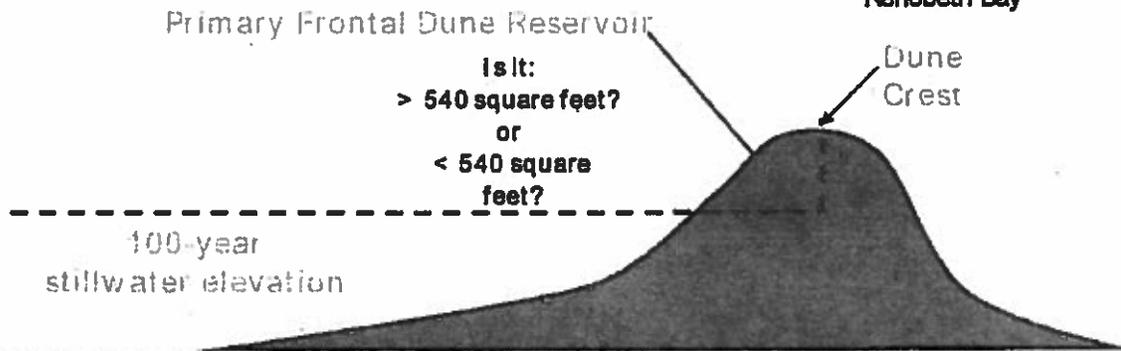
Standard Erosion Analysis

□ Dunes:

- Dune erosion based on the 540 sqft rule
- Dune retreat
- Dune removal
- Primary Frontal Dune (PFD) delineation



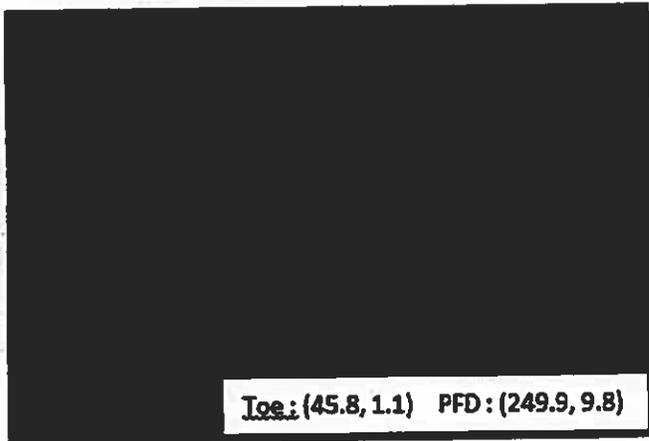
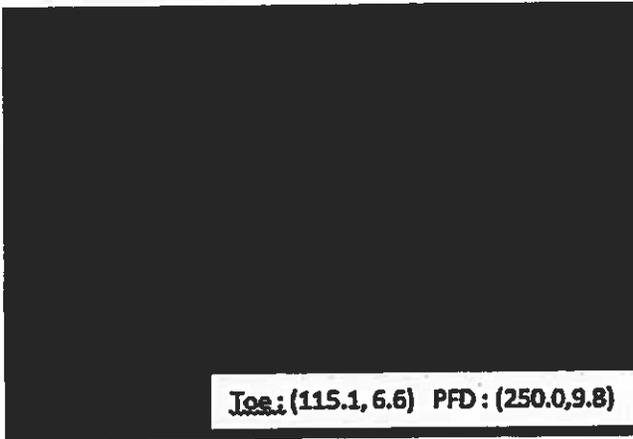
PFD in Sussex County near Rehoboth Bay



Revised erosion analysis (Tr. 1600 as an example)

- 2013 Prelim: toe set at the 10yr SWEL elevation and standard removal slope of 1:50. Treated as removal case - creating mild slope after erosion

- Revised: toe was lowered to elevation 1.1ft. Erosion profile was modified to be consistent with survey and observation. Treated as retreat case - creating steep slope after erosion



Wave Runup

- Runup modeled for beaches, bluffs, cliffs and coastal structures

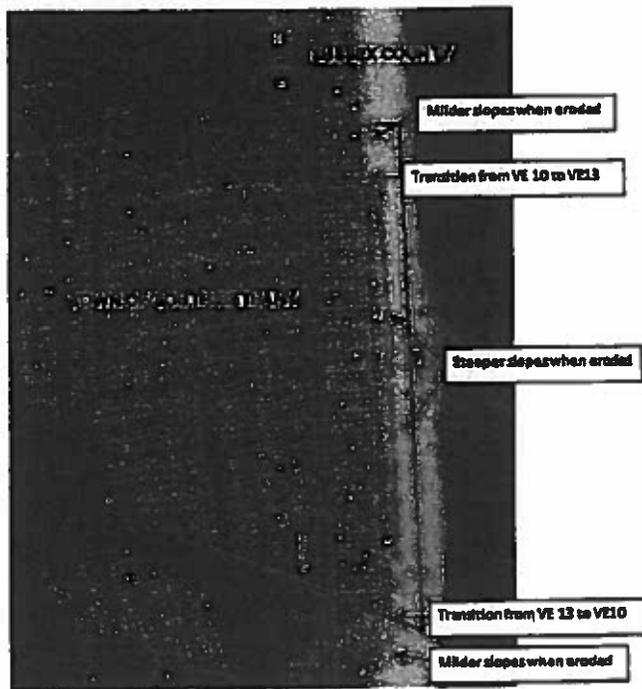
- Methods:

 - Runup 2.0 or TAW

 - (TAW used for Revised modeling due to steeper slopes)

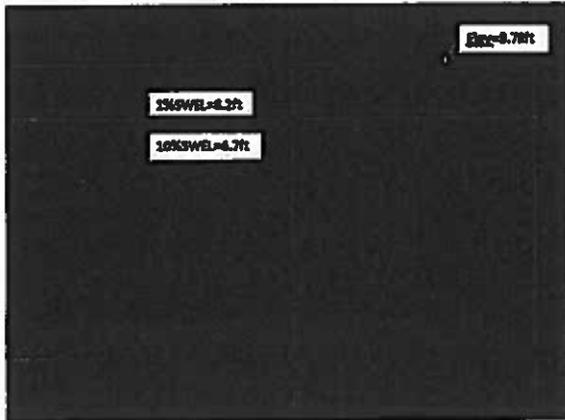


Runup Analysis in South Bethany

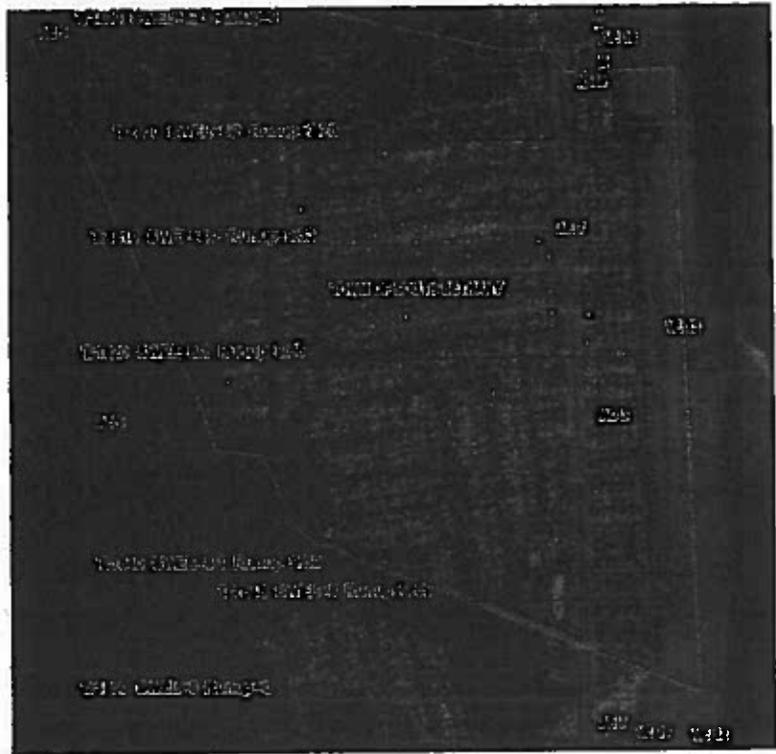


Runup on the transects in South Bethany

- Right figure: Blue lines are transects within the town, with transect ID number, SWEL, and runup elevations labeled.



- Left figure: Profile view of Tr. 1610

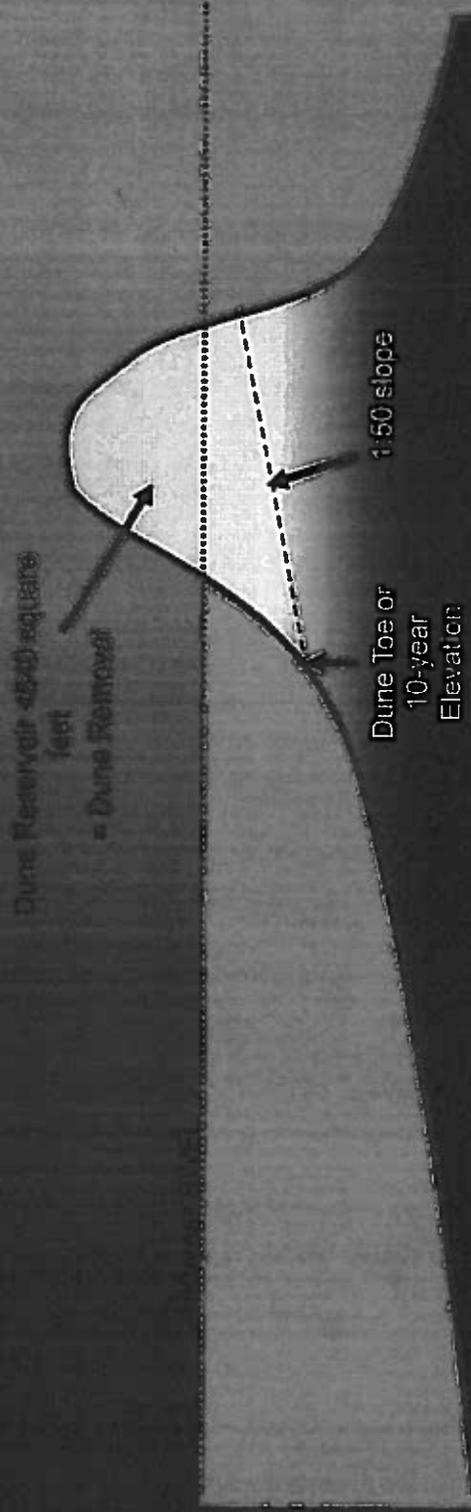
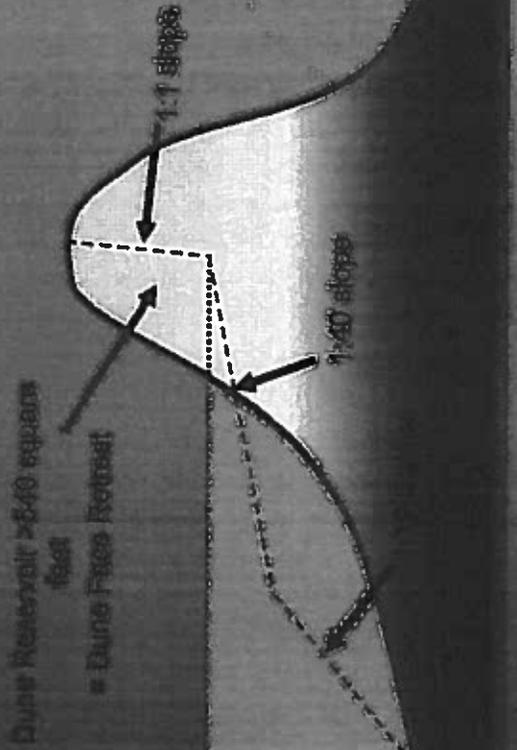




Questions



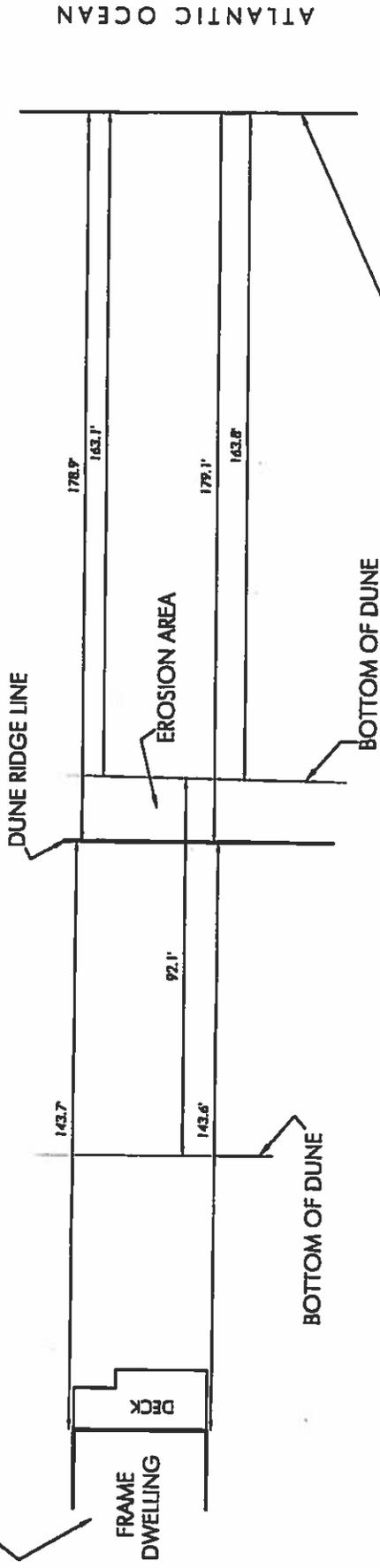
Dune Cases - Retreated or Removed



SITE #3 - SOUTH BETHANY

Exhibit D

302 NORTH OCEAN DRIVE
SOUTH BETHANY, DE 19930
TAX MAP #1-34-17.20-204.00



ATLANTIC OCEAN

APPROXIMATE WATERLINE
8:20 AM / JANUARY 4, 2016
MEASUREMENT TAKEN FROM
WOODEN STAKES AS SHOWN IN
PHOTOGRAPH

EROSION LOCATION PLAN FOR 302 NORTH OCEAN DRIVE



SCALE: 1" = 40'

Prepared by:

FORESIGHT Services

Surveying & Precision Measurement

2100A Coastal Highway Dewey Beach, DE 19971

302 224 2229 phone 302 226 2229 fax

SITE #3 - SOUTH BETHANY



EROSION AREA



EROSION AREA



EROSION AREA



APPROXIMATE WATERLINE
8:20 AM / JANUARY 4, 2016
MEASUREMENT TAKEN FROM
WOODEN STAKES AS SHOWN IN
PHOTOGRAPH

SITE #2 - BETHANY BEACH BOARDWALK



EROSION AREA



EROSION AREA



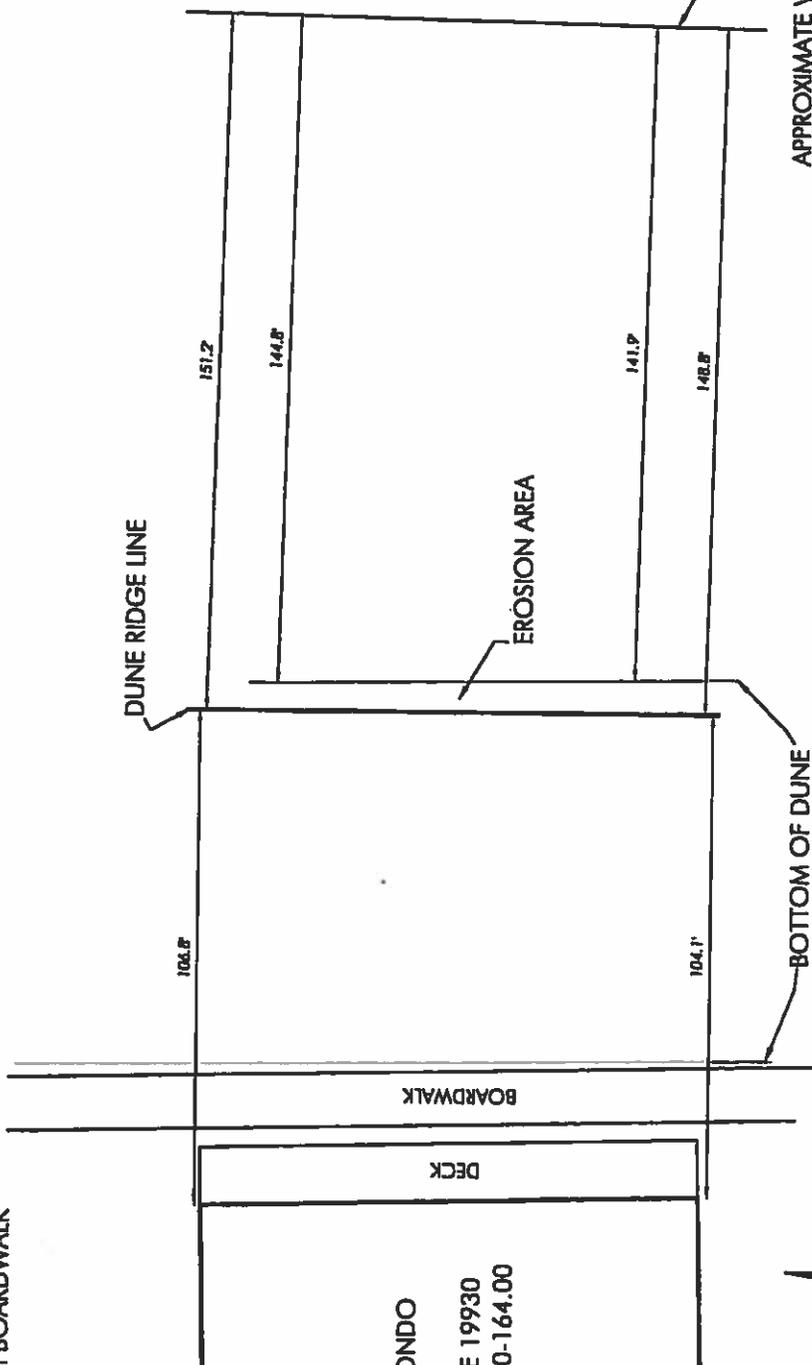
EROSION AREA



APPROXIMATE WATERLINE
9:00 AM / JANUARY 4, 2016
MEASUREMENT TAKEN FROM
WOODEN STAKES AS SHOWN IN
PHOTOGRAPH

SITE #2 - BETHANY BEACH BOARDWALK

OCEAN EIGHT CONDO
UNITS A-H
BETHANY BEACH, DE 19930
TAX MAP #1-34-13.20-164.00



APPROXIMATE WATERLINE
9:00 AM / JANUARY 4, 2016
MEASUREMENT TAKEN FROM
WOODEN STAKES AS SHOWN IN
PHOTOGRAPH

EROSION LOCATION PLAN FOR BETHANY BEACH BOARDWALK



SCALE: 1" = 40'

Prepared by:
FORESIGHT Services
Surveying & Precision Measurement
302 226 2279 phone 302 226 2239 fax 2100A Coastal Highway Dorney Beach, DE 19971

SITE #1 - TOWER SHORES DEVELOPMENT (NORTH BETHANY)



EROSION AREA



EROSION AREA

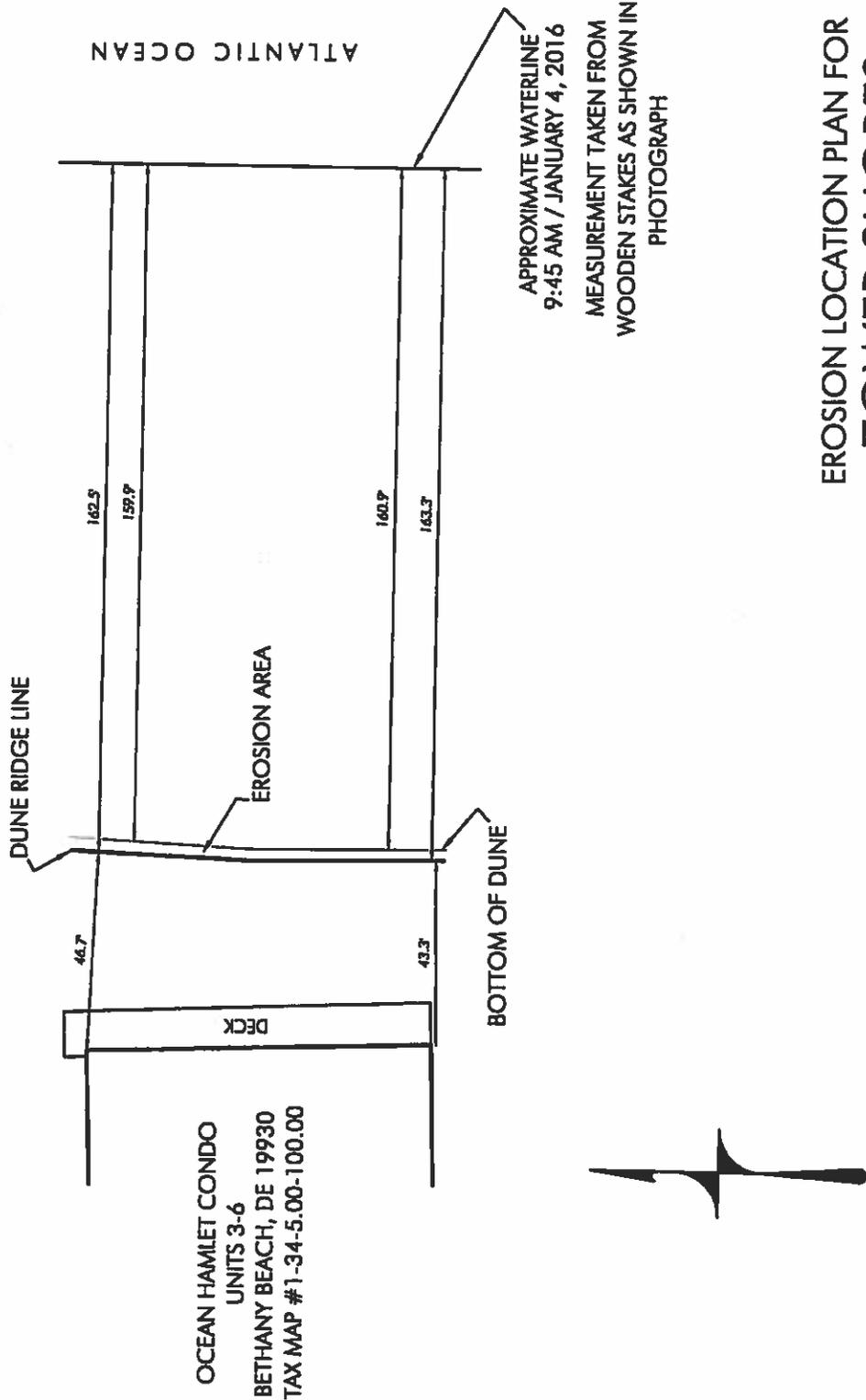


EROSION AREA



APPROXIMATE WATERLINE
9:45 AM / JANUARY 4, 2016
MEASUREMENT TAKEN FROM
WOODEN STAKES AS SHOWN IN
PHOTOGRAPH

SITE #1 - TOWER SHORES DEVELOPMENT (NORTH BETHANY)



EROSION LOCATION PLAN FOR
TOWER SHORES



Prepared by:
FORESIGHT Services
Surveying & Precision Measurement
302 226 2279 phone 302 226 2239 fax 2103A Coastal Highway Dune Beach, DE 19971

Worley, Christine

From: Zhao, Heather
Sent: Tuesday, February 26, 2013 10:21 AM
To: Gangai, Jeff; Worley, Christine; Hayden, Jesse
Subject: RE: Suggestions for remedies - Sussex County Preliminary data - Atlantic Ocean

Jeff,

We are planning to add the whole boardwalk to VE zone and will evaluate if should include some of the buildings based on contour and modeling results.

Thank you for your input,
Heather

From: Gangai, Jeff [mailto:JGangai@Dewberry.com]
Sent: Tuesday, February 26, 2013 8:01 AM
To: Zhao, Heather; Worley, Christine; Hayden, Jesse
Subject: RE: Suggestions for remedies - Sussex County Preliminary data - Atlantic Ocean

Looks like there is some dune line starting to form there although not very pronounced. I know in other areas, such as on Long Island in Long Beach, we have taken the approach of including the broad walk in the VE but no further.

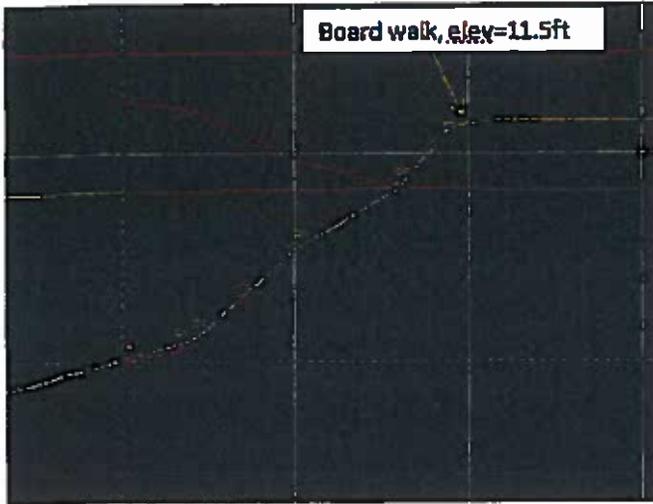
Jeff Gangai, CFM
Associate
Coastal Department Manager
Water Resources Consulting
Dewberry
8401 Arlington Blvd.
Fairfax, VA 22031
703.849.0251
703.206.0836 fax
www.dewberry.com

From: Zhao, Heather [mailto:heather.zhao@urs.com]
Sent: Monday, February 25, 2013 2:42 PM
To: Worley, Christine; Hayden, Jesse
Cc: Gangai, Jeff
Subject: RE: Suggestions for remedies - Sussex County Preliminary data - Atlantic Ocean

Christine,

I forgot to mention that we don't have PFD line delineated for the board walk area. and we did not perform erosion either. Runup was performed for some transects in that area. I think it is reasonable to include the whole board walk in V zone but at a stretch to add the seaward portion of the oceanfront buildings.

Heather



From: Zhao, Heather
Sent: Monday, February 25, 2013 2:15 PM
To: Worley, Christine; Hayden, Jesse
Cc: Jeff Gangai (JGangai@Dewberry.com)
Subject: RE: Suggestions for remedies - Sussex County Preliminary data - Atlantic Ocean

Christine,
The board walk in Rehoboth Beach does have elevation of 12ft at some places and 10ft at other places in our topo. The board walk comes in and out of the preliminary floodplain and we only have the seaward side of a couple of buildings in VE zone right now.

Heather

The thick yellow line is the 12ft contour.



From: Worley, Christine
Sent: Friday, February 22, 2013 12:41 PM
To: Hayden, Jesse; Zhao, Heather
Cc: Jeff Gangai (JGangai@Dewberry.com)
Subject: FW: Suggestions for remedies - Sussex County Preliminary data - Atlantic Ocean

Jesse and Heather,

Looks like Mike Powell has been busy. Can you look into Mike's proposed solutions and see if they are reasonable? I would like to be prepared to discuss with Robin on our prep call on Monday at 11:00.

Thanks,
Christine

From: Powell, Michael S. (DNREC) [mailto:Michael.Powell@state.de.us]
Sent: Friday, February 22, 2013 12:35 PM
To: Danforth, Robin
Cc: Worley, Christine; jganga@dewberry.com; Williams, Gregory S. (DNREC)
Subject: Suggestions for remedies - Sussex County Preliminary data - Atlantic Ocean

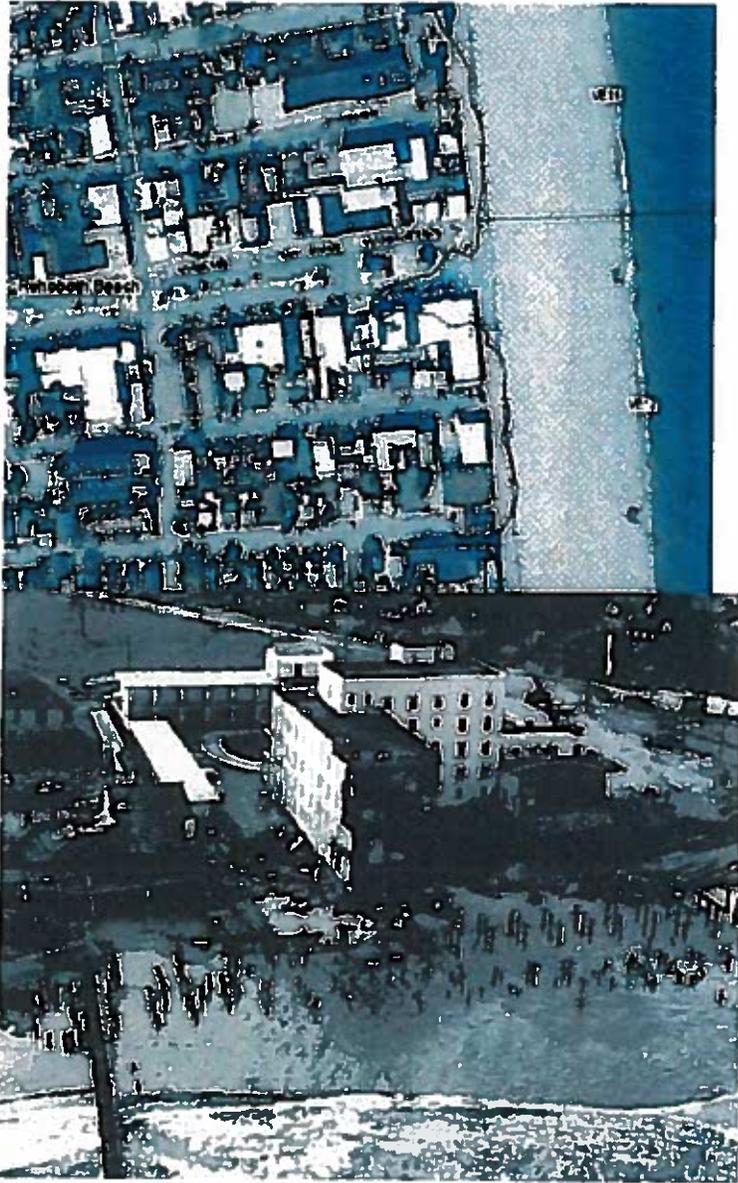
Hi Robin,

When last we spoke on this topic, I agreed to give you some feedback on possible directions for taking a second look at the preliminary DFIRM data for some of the areas along the Atlantic Ocean coast. The more I looked into it, the more I realize that just about the entire reach of coast from Rehoboth Beach south to the Maryland State line contain numerous floodplain mapping issues that I am concerned about. Without reviewing and commenting on the entire coast, which ultimately will have to be done, here are some high level comments:

Issue – portions of the Rehoboth Beach boardwalk are being completely removed from the SFHA

Discussion – The Rehoboth boardwalk was mostly destroyed by storms in March 1962 and January 1992, which likely did not exceed 1% return criteria. We have traced this problem to the LiDAR data, which did not appear to remove the boardwalk from the data, therefore the boardwalk surface elevation 12 was probably modeled as bare earth. In fact the grade underneath the boardwalk is several feet lower than the surface of the boardwalk. The photograph on the right shows boardwalk destruction in 1962 roughly (slightly north of) in the area of the map to the left

Potential Solution – move the VE zone west to include all of the boardwalk and the seaward portions of oceanfront buildings, which were also damaged in 1992.



Issue – portions of the southern portions of Dewey Beach are being completely removed from the SFHA, and the 500 year floodplain.

Discussion – Ocean flooding flowed over the dunes, across coastal highway and into Rehoboth Bay in storms in March 1962 and January 1992, which likely did not exceed 1% return criteria. The photo on the right shows post-storm damage and overwash in

Potential Solution – Continue to show these areas as AO depth 2 feet which seems to be consistent with observed conditions.



Issue – The oceanfront VE zone BFE's in Dewey Beach Jump from 12 to 17 in one area

Discussion – We are not aware of any storm observations or data that would indicate higher BFEs are appropriate on this reach of shoreline.



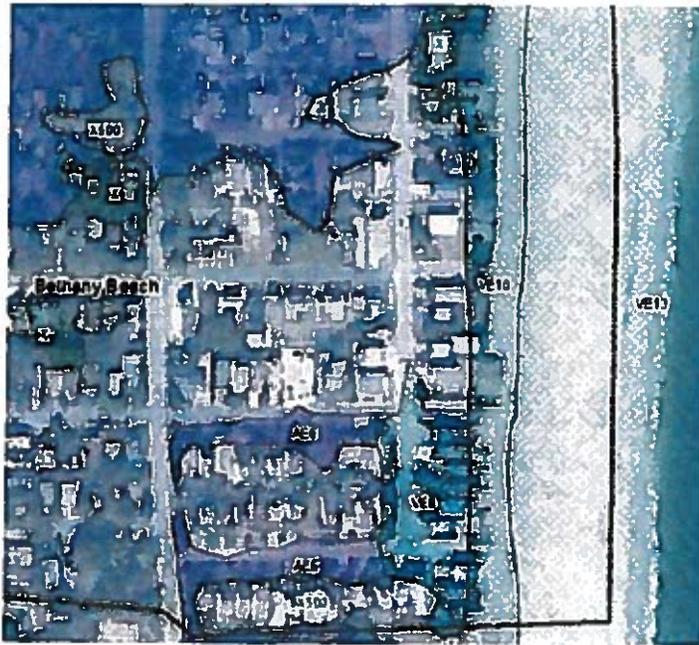
Issue – portions of the what is referred to “North Bethany” (unincorporated neighborhoods between The Town of Bethany Beach and Indian River Inlet) are being completely removed from the SFHA

Discussion – Ocean flooding flowed over the dunes, across coastal highway and into Indian River Bay in a storm in March 1962, which likely did not exceed 1% return criteria. The photograph on the right shows small building washed across coastal highway by ocean surge flooding in exactly the location of the DFIRM map on the left. While coastal highway IS in the SFHA in the preliminary data, the preliminary data seems to under-predict the ocean surge flooding which was sufficient to wash buildings off their foundations in this area.

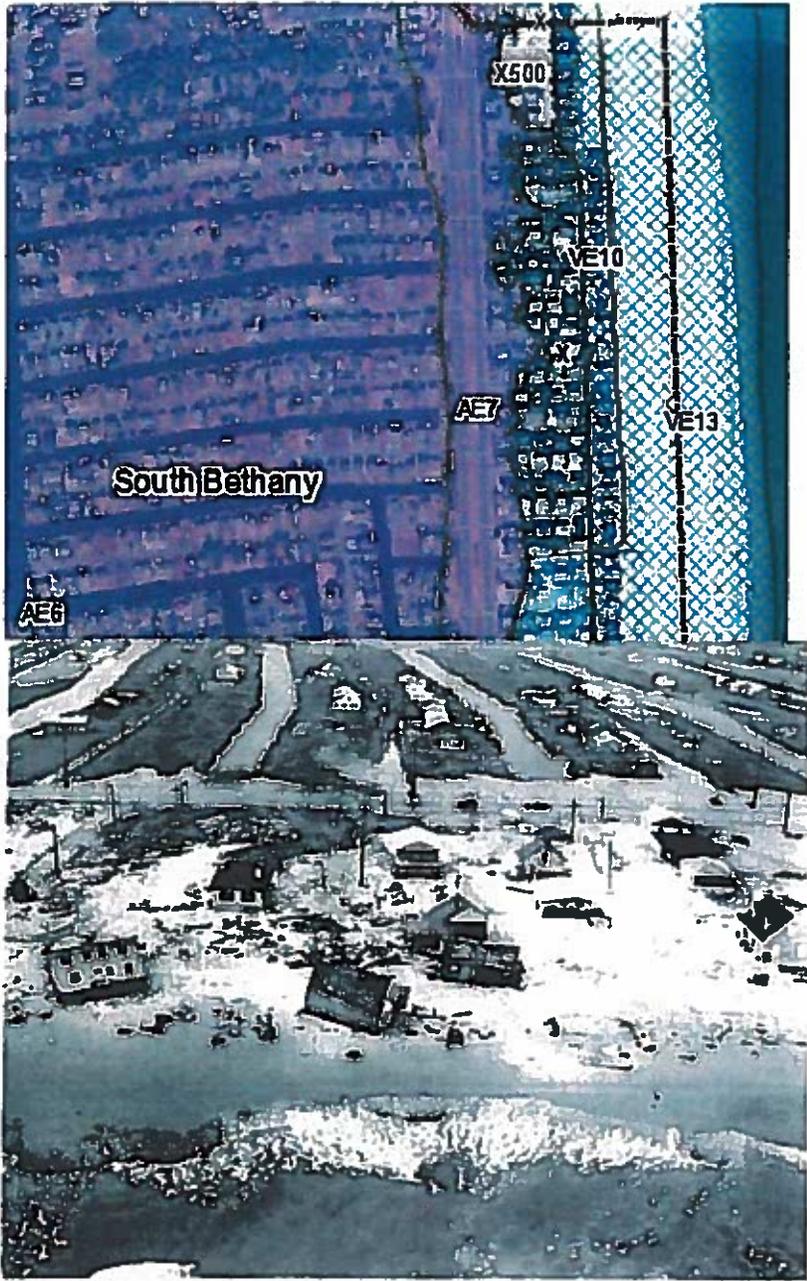
Potential Solution – Continue to show these areas as AO depth 2 feet which seems to be consistent with observed conditions.



Issue – portions of Bethany Beach are being completely removed from the SFHA, and are shown as X or X500.
Discussion – Ocean flooding flowed over the dunes, as far inland as coastal highway in storms in March 1962 and January 1992, which likely did not exceed 1% return criteria. The south half of the oceanfront block of Bethany is quite flat an almost basin – like with slightly higher elevations immediately to the west of coastal highway. This area tends to hold 1-2 feet of shallow flooding in severe coastal storms. The photo in the right is taken looking south on coastal highway into the area shown on the map to the left.
Potential Solution – The area is shown as AE on the current maps, and this, or AO depth 2 might be a workable solution.



Issue – portions of South Bethany Beach are being completely removed from the SFHA and 500 year floodplain.
Discussion – Ocean flooding flowed over the dunes, across coastal highway and into Assawoman Bay in storms in March 1962 and January 1992, which likely did not exceed 1% return criteria. The picture to the right shows that overwash in South Bethany in roughly the area of the map on the left
Potential Solution – Continue to show these areas as AO depth 2 feet which seems to be consistent with observed conditions.



Issue – Small areas between South Bethany Beach and Fenwick Island are being completely removed from the SFHA.

Discussion – This removal is quite surprising. The Barrier Island is at its narrowest in these areas, and Ocean flooding flowed over the dunes, across coastal highway and into Assawoman Bay in storms in March 1962 and January 1992, which likely did not exceed 1% return criteria.

Potential Solution – Continue to show these areas as AO depth 2 feet which seems to be consistent with observed conditions.



Issue – Areas in Fenwick Island are being completely removed from the SFHA, and 500 year floodplain.
 Discussion – Ocean flooding flowed over the dunes, across coastal highway and into Assawoman Bay in storms in March 1962 and January 1992, which likely did not exceed 1% return criteria.
 Potential Solution – Continue to show these areas as AO depth 2 feet which seems to be consistent with observed conditions.



Michael S. Powell
 Environmental Scientist IV
 Flood Mitigation Program
 Phone: (302) 739-9921

Fax (302) 739-6724
c-mail: michael.powell@state.dc.us

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