

Figure 8.2 April 2001 Corps of Engineers Profiles West End of Emerald Isle

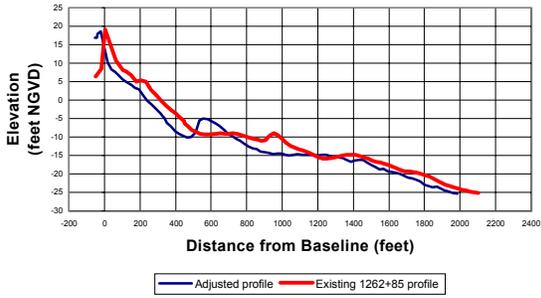
Accordingly, the shape of the profile at station 1252+76 was used to represent the shape that the other profiles would assume following the channel relocation. The adjusted profile at the other 5 stations was estimated based on the predicted erosion of the shoreline following the channel relocation. The adjusted profiles for the 5 stations are shown on Figure 8.3. The volume of material represented by these assumed profile adjustments was estimated to be 2,065,000 cubic yards.

8.4. Time Required for Shoreline Adjustments on the West End of Emerald Isle. Erosion and redistribution of this material may take a considerable amount of time. However, not all of this material would be transported out of the area by longshore transport processes since approximately 1.5 million cubic yards (located between baseline stations 1282+85 and 1302+81) is associated with the portion of the ebb tidal delta that would be abandoned following the relocation of the channel. The remaining 565,000 cubic yards to be redistributed, is located between baseline stations 1252+76 and 1282+85 along the east end of the shoreline adjustment area outside the direct influence of the ebb tidal delta. The ebb tidal delta material will immediately begin to migrate onshore following the construction of the sand dike with most of the 1.5 million cubic yards of ebb tidal delta material expected to deposit in the seaward portion of the existing channel during the first 2 years following channel relocation.

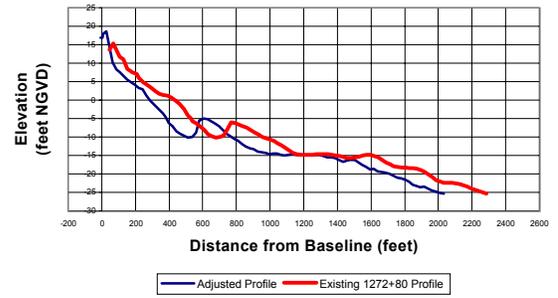
The erosion of the 565,000 cubic yards of material situated east of baseline station 1282+85 would be controlled to some extent by longshore sediment transport process, particularly once the abandoned portion of the ebb tidal delta collapses to the point that it no longer significantly impacts wave conditions on the west end of Emerald Isle. Accordingly, an estimate of the amount of time required for the shoreline east of baseline station 1282+85 to adjust was based on sediment transport rates in the area. Estimates of the sediment transport rates applicable to the Emerald Isle shoreline located outside the influence of Bogue Inlet, yielded an average net transport to the west of 272,300 cubic yards/year. With the net sediment transport rate west of station 1252+76 increasing from its present rate of near zero to 272,300 cubic yards/year, the time required to remove the 565,000 cubic yards of material from the shoreline between stations 1252+76 and 1282+85 would be approximately four years. Since most of the longshore movement of the material will not occur until the abandoned portion of the ebb tidal delta undergoes substantial adjustments, the total amount of time for these adjustments to occur will be around six years.

8.5. Shoreline Adjustments on Bear Island. The westward repositioning of the ebb channel and the associated reconfiguration of the ebb tidal delta will have the opposite effect on the Bear Island shoulder. The movement of the ebb delta's apex farther to the west will lead to a seaward movement of the ebb delta's western segment outer margin (zone of breaking waves). This seaward extension of the platform will have a positive influence on the adjacent Bear Island oceanfront by altering the wave refraction patterns and ultimately leading to a reversal of the historic shoreline change trend. Again, based on the amount of shoreline recession that occurred between 1978 and 2001 on Bear Island, various sections of the oceanfront shoreline on Bear Island could accrete by the amounts indicated in Table 8.2:

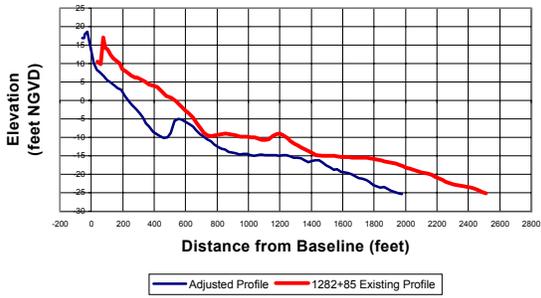
Adjusted Sta 1262+85 Following Channel Relocation



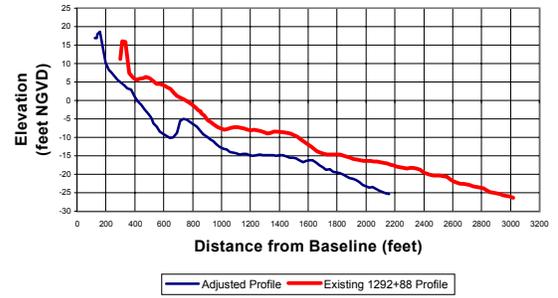
Adjusted Sta 1272+80 Following Channel Relocation



Adjusted Sta 1282+85 Following Channel Relocation



Adjusted Sta 1292+88 Following Channel Relocation



Adjusted Sta 1302+81 Following Channel Relocation

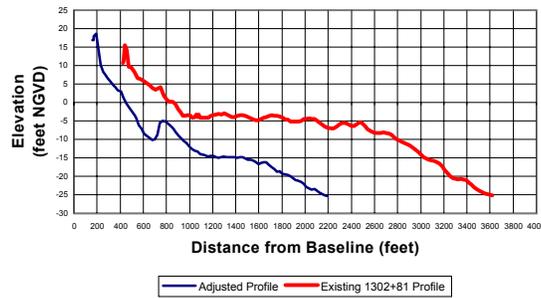


Figure 8.3 Predicted Profile Adjustments Following Relocation of the Bogue Inlet Ebb Channel