

**Table 8.2**  
**Accretion Rates Associated with Bear Island**

	Average Accretion <sup>(a)</sup>	Maximum Accretion
Transects 25 to 27	+470 feet	520 feet
Transects 28 to 32	+230 feet	280 feet
Transects 33 to 37	+130 feet	200 feet

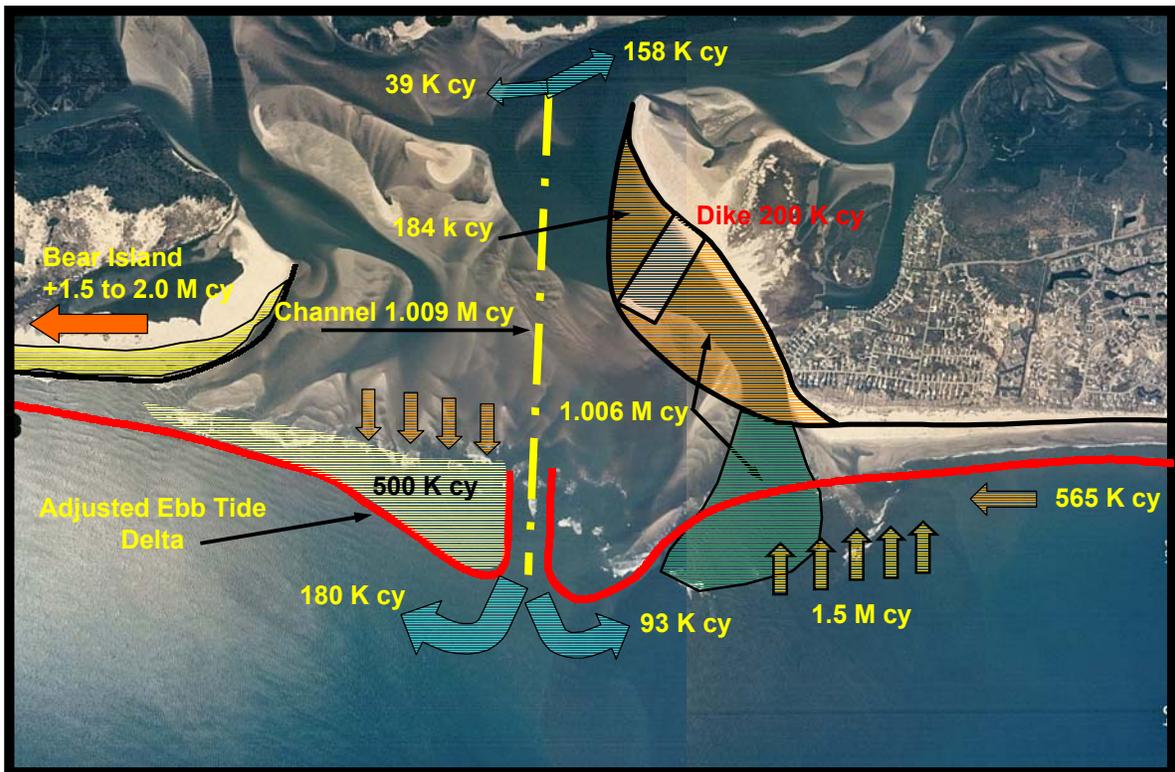
<sup>(a)</sup> Average accretions rounded from those presented in Section 4.

The volume of material required to effect these shoreline adjustments on Bear Island would range between 1.5 and 2.0 million cubic yards. The buildup of this volume of material would come directly from the accumulation of littoral sediment presently being transported into Bogue Inlet that would be prevented from doing so once the ebb tidal delta of Bogue Inlet readjusts to the new channel position and alignment. The accretion on Bear Island will be rather slow and could take up to ten years to occur.

Apart from the positive impacts on the ocean shoreline of Bear Island, a relatively wide marginal flood channel is likely to develop that will separate the evolving ebb channel from the Bear Island inlet shoreline. As a consequence, eastward spit growth on the western shoulder of the inlet near Bear Island will be very limited.

The channel relocation project is not expected to have a direct negative impact on the integrity of Island 2. However, the continued westward growth of the estuarine portion of the Bogue Banks spit may eventually lead to the deflection of the ebb channel to a position adjacent to the eastern portion of Island 2. As discussed above, the growth within this area would not resume until the new sand spit accreted beyond the sand dike position. The eventual erosion of this ephemeral island will likely occur with or without channel relocation, and as discussed previously, Island 2 migrated a significant distance to the west between September 2001 and September 2002.

**8.6. Sediment Redistribution.** The repositioning of the main ebb channel through Bogue Inlet to a more central position between Bogue Banks and Bear Island will result in the redistribution of a rather large volume of sediment either through the direct actions associated with the channel relocation and dike construction or indirectly through sediment transport process driven by tidal currents and wave action. A summary of the sediment redistribution expected to accompany the construction of the 13.5 ft NGVD x 500 ft channel is shown schematically on Figure 8.4. Also shown on Figure 8.4 are the projected shorelines on the east end of Bear Island and the west end of Bogue Banks and a general outline of the reconfigured ebb tidal delta. As discussed in the geomorphic analysis section, the middle ground shoal of Bogue Inlet has apparently been building in elevation as a result of the present delta configuration that allows swash bars to move directly into the area. With the channel located in a more central location, this stored material will be pushed seaward and reshaped by the new wave refraction patterns associated with the repositioned channel. Finally, the predicted accretion on Bear Island will result in the retention of 1.5 to 2.0 million cubic yards of material that would, under existing conditions, have been transported into and retained by the inlet system.



**Figure 8.4**  
**Schematic of Sediment Redistribution Following Channel Relocation**