

“Loving The Shore to Death”

- History of seaboard settlement
- Seafood resources (“mariculture”)
- Moderate “maritime” climate
- Recreation, beauty, tranquility
- Cool ocean breezes on hot summer days!



OC commercial fishing



OC beachfront

“Scenery for Sale”



OC bayside development over marsh, 94th Street

Who doesn't like a room with a water-view? But as my PhD advisor Conrad Neumann liked to say...

“If you can see the sea, the sea can see you.”

As in NJ, DelMarVa barrier beaches and their leeward wetlands are stressed by a *growing*, and *seasonally explosive* population



Source: National Estuarine Program Coastal Condition Report (Ch. 3, 2007), EPA

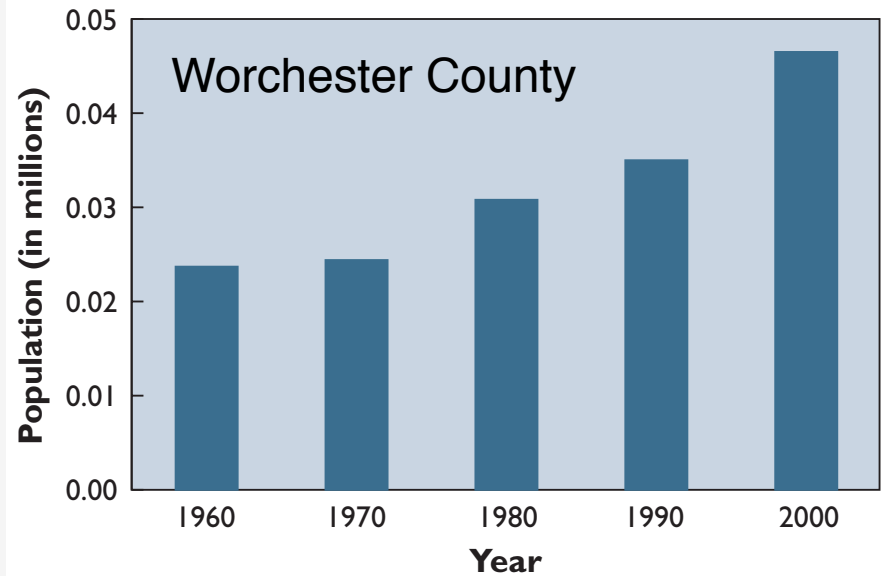
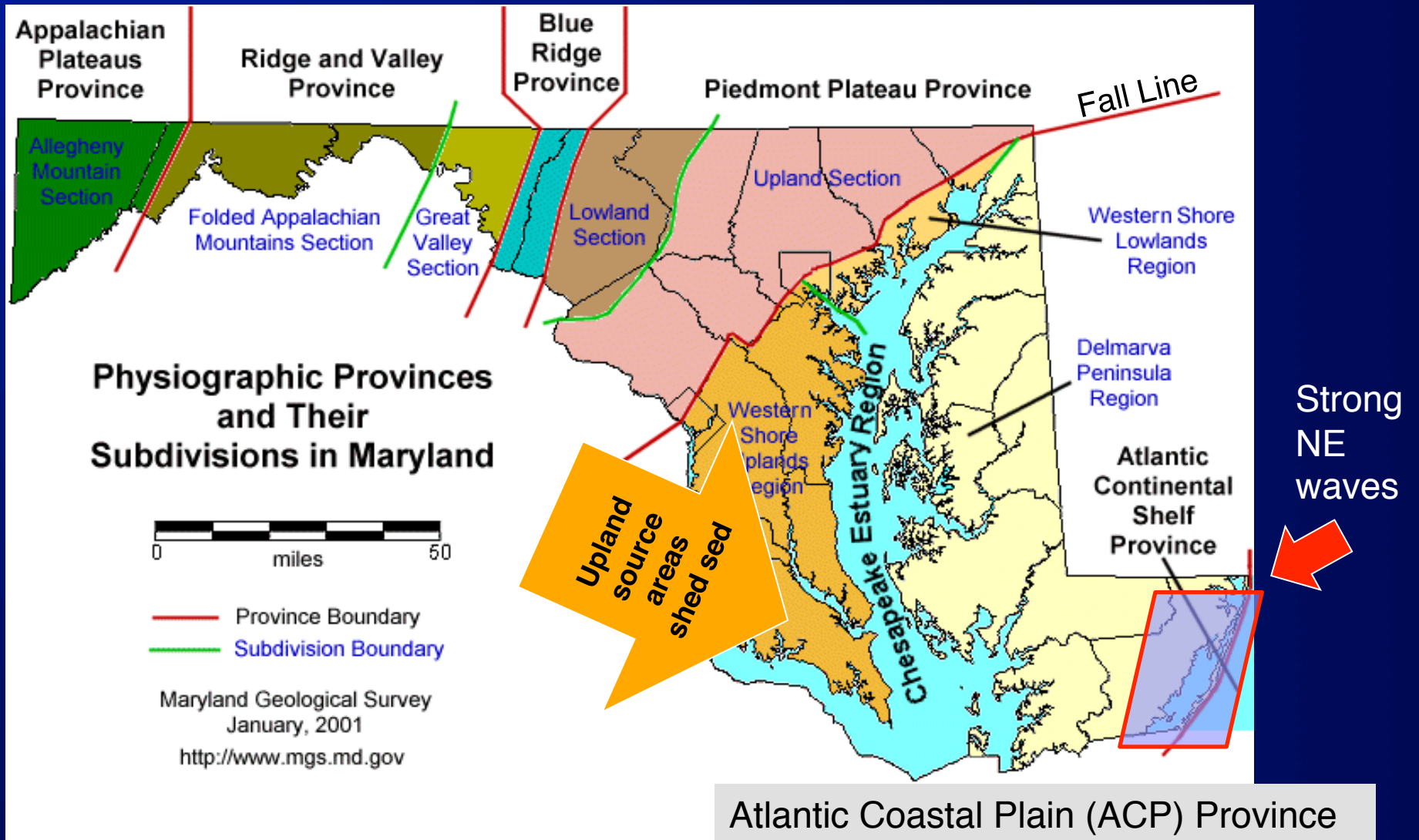


Figure 3-101. Population of NOAA-designated coastal county of the MCBP study area, 1960–2000 (U.S. Census Bureau, 1991; 2001).

Ocean City, MD:
Just you... and 300,000 of your *close friends* enjoying nature on a sunny summer weekend!



Ultimate Sourcing of Coastal Plain Sediments = Ancient Eroded Mountains to the West



Transport Imparts Sediment “Maturity”

Clastic sediment can “mature” only given sufficient **transport time and distance** – this is generally more available in passive-margin, broad-shelf settings – **like the Atlantic Coastal Plain**

Maturity increases

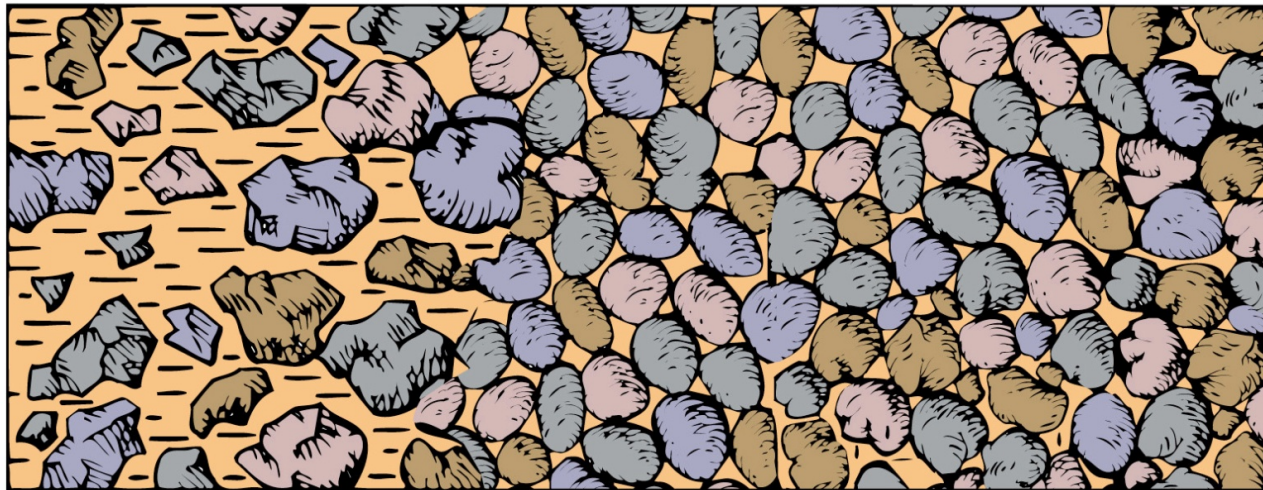
Degree of sorting increases

Clay content decreases

Rounding of sand particles increases

Time increases

Quartz content
increases...



— Clay particle

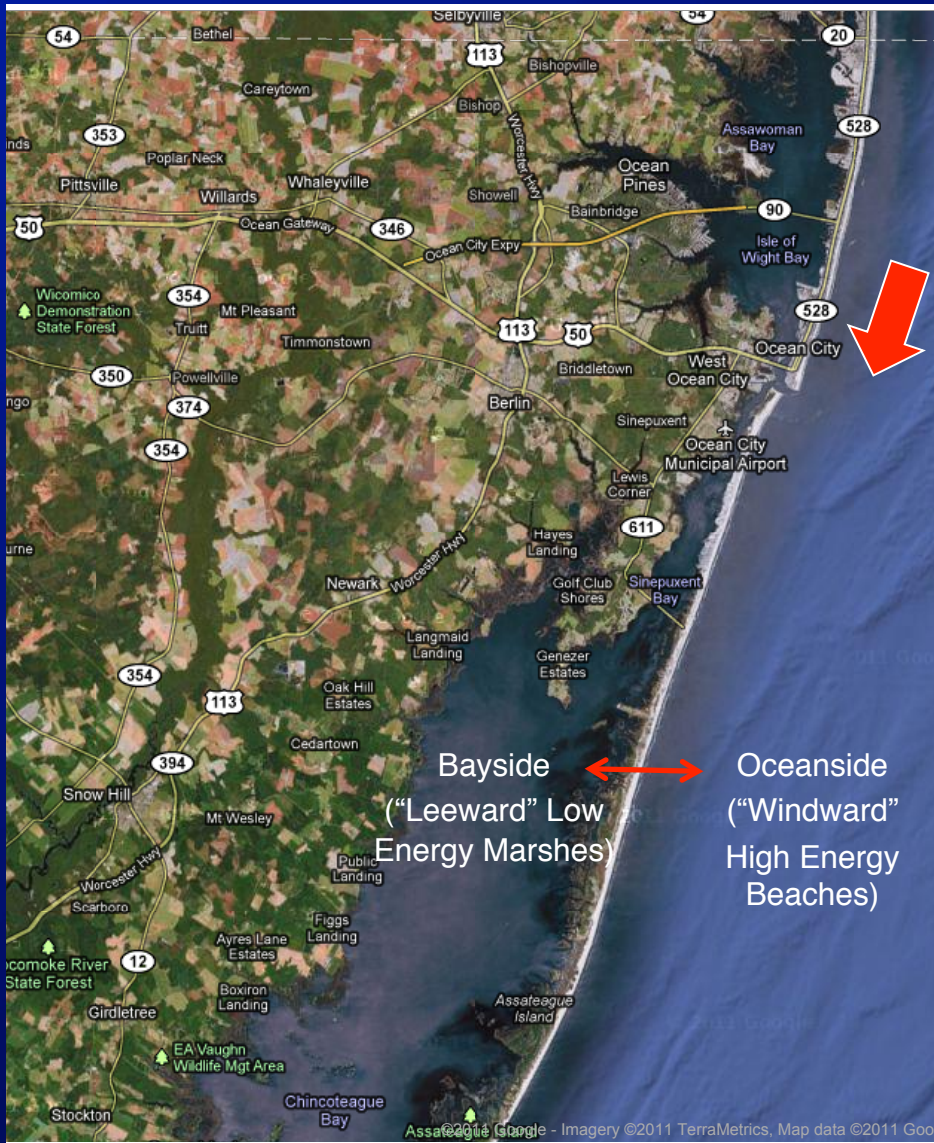
Alex., VA stream



Assa., MD beach



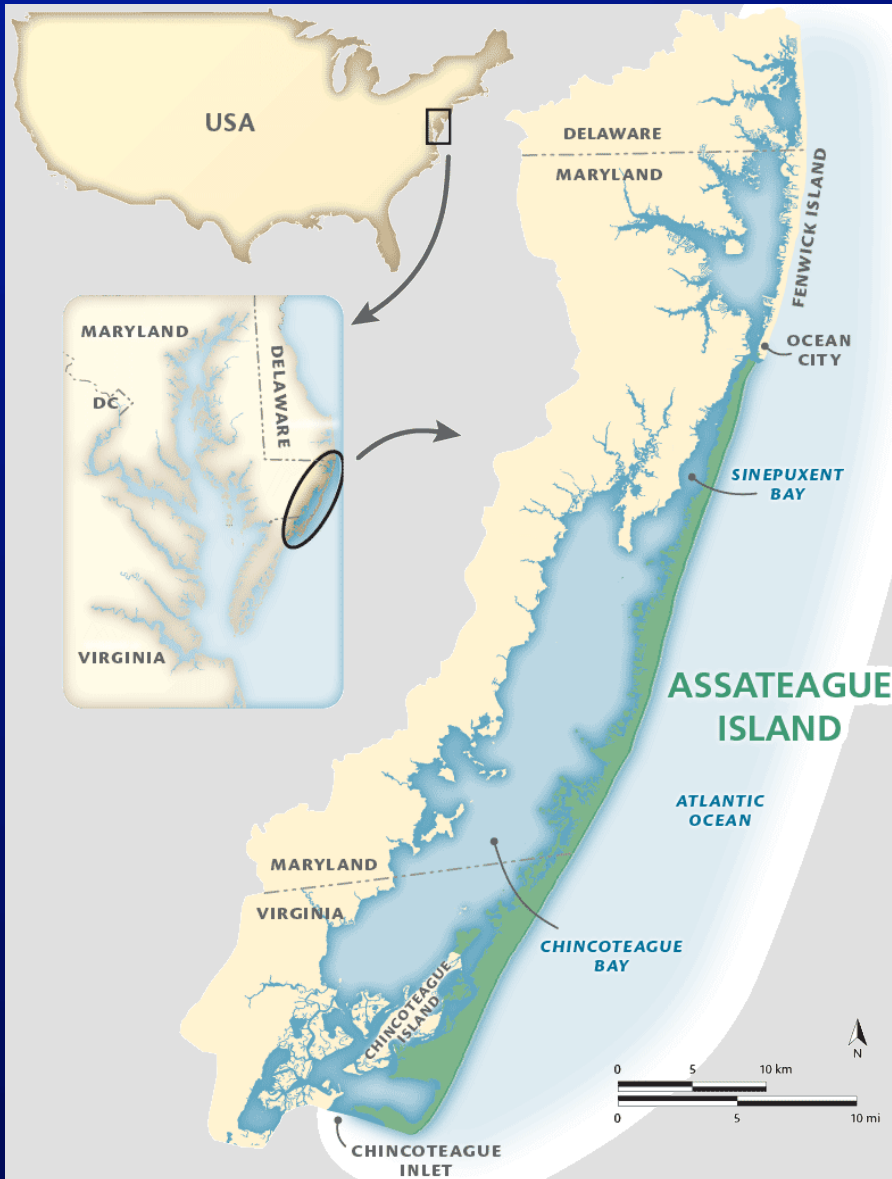
Fenwick (F) and Assateague Island (AI)



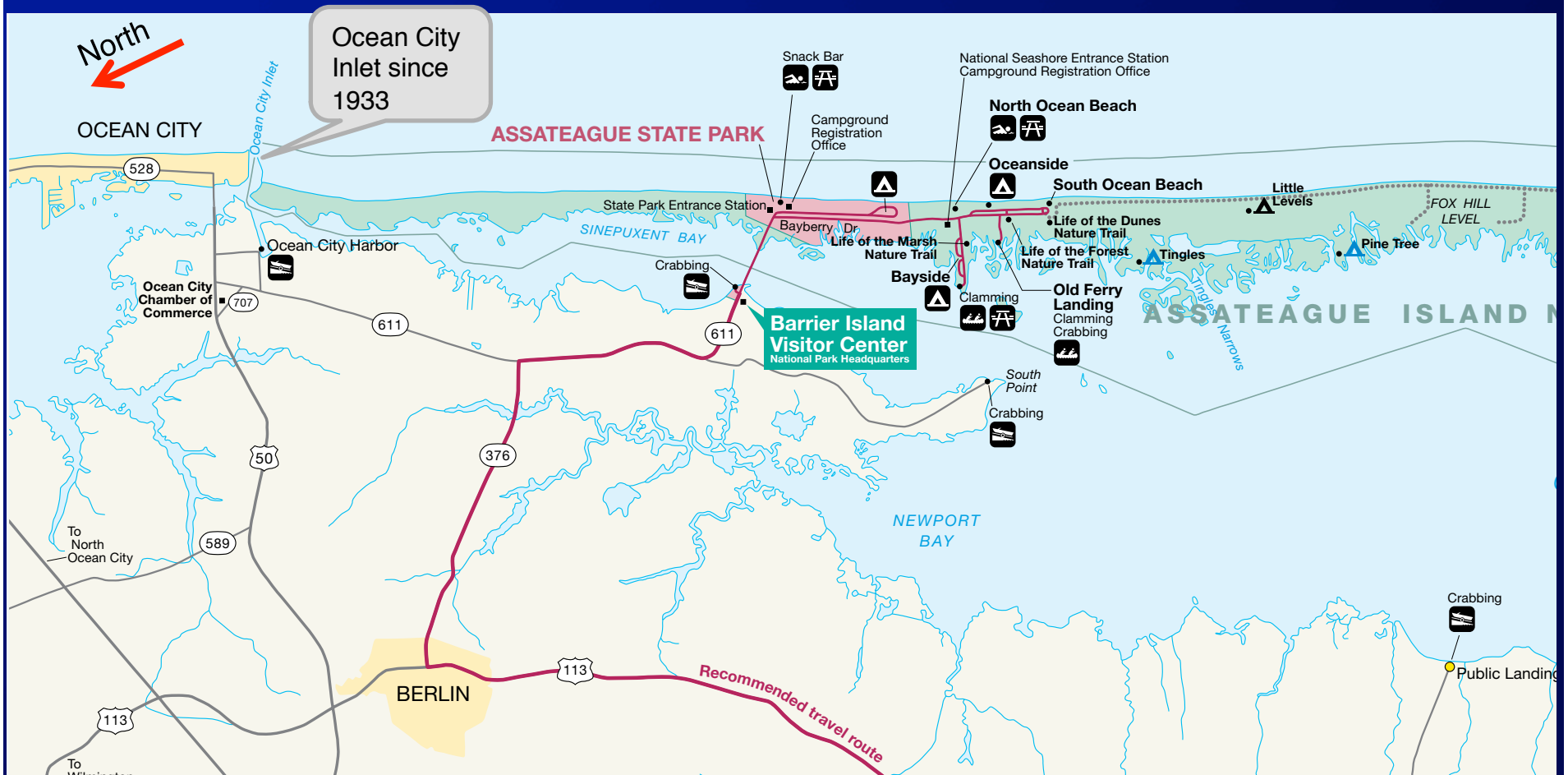
Windward – Leeward differences:
 Energy-Salinity-Sedimentary Processes-Biota

Maryland's Barrier Coasts: Fenwick and Assateague Island

Alternative destinies for two “Restless Ribbons of Sand”



Assateague Island – Ocean City Beaches



NPS/AINS

Consider exploring the more natural, less-developed scene at Assateague, and then the more impacted one at Ocean City – *a stark comparison!*

Consider watching the historical NPS video called “Saving Assateague” (15 mins)

Available online at:

<https://youtu.be/0BOUq17jDf4>

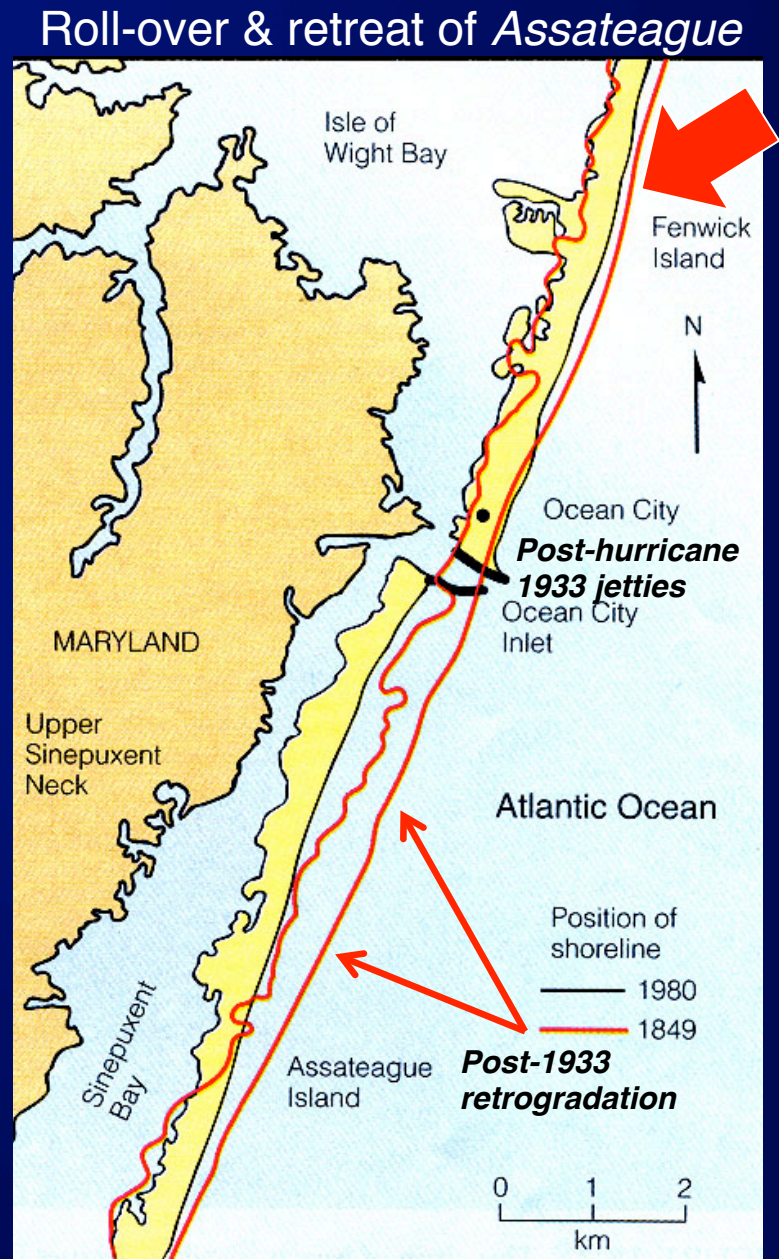


Or, read the history at:

<https://mdcoastdispatch.com/2015/02/11/assateague-island-marking-50-years-as-national-park-island-almost-developed-several-times-in-past/>

Basic Requirements and Services

- Barrier island systems develop most easily on wave-dominated coasts with small to moderate tidal range, a relatively low-gradient shelf, ample sediment supply, and stable sea level (so waves can concentrate sand into one coherent strip, and *allow time for vegetated dunes to form – the role of vegetation is critical*).
- Barrier islands play an enormous role in *blocking oceanic swells and storm waves from impacting the mainland behind them*. This natural “wave break” creates a unique “leeward” bay setting of lower energy, brackish water, and high biological productivity in wetlands (sun plus nutrients).
- *Without barrier islands wetlands and mainland coasts* would be destroyed by the daily pounding of open ocean wave energy.



Wetlands Matter



Wetland ecosystem “services”:

- Provide an intricate coastal wave-energy buffer – especially during storms
- Soak-up and suppress polluted storm-water runoff (and misc. other garbage)
- *Sequester excess atmospheric CO₂ and local nutrient runoff (especially agricultural & septic) – key to reducing algal blooms and coastal “dead” zones*
- Trap and bind fine soil particles before they enter bays (where they can shade submerged aquatic vegetation – the critical “nursery & cafeteria”)
- *Provide habitat and forage for wildlife – including juvenile fish and crabs (2/3 of commercially important fish depend on wetlands at some stage of life)*

Over-development extends to wetlands:

“Beach Haven West” in NJ was once a pristine wetland



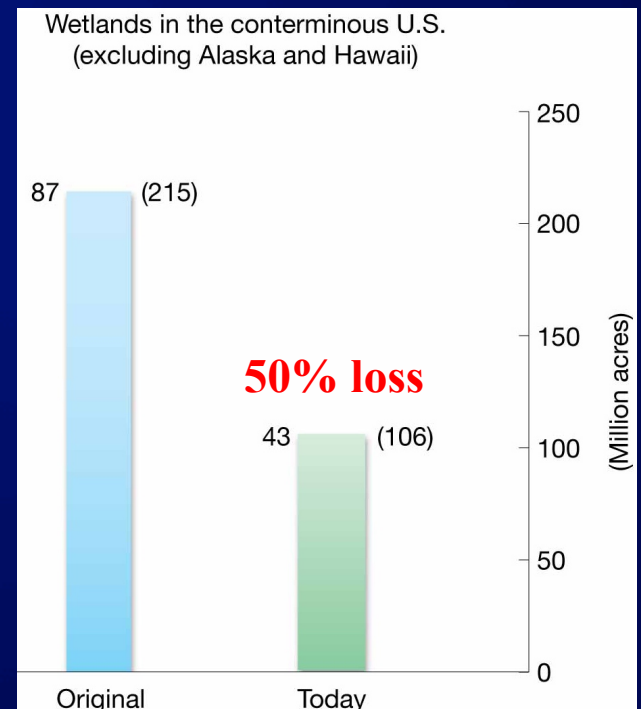
Note preliminary “finger” canals cut into undeveloped half as well as in nearly submerged and recently detached portion to lower right

Development of “Remson Meadows” (behind Long Beach Island, NJ) began in the 1950’s. *Wetlands Protection Act and EPA prevented total destruction of the marsh.*

“Kids today” have no historical memory of the nature that once was.

There’s a term for this:

“Shifting Baselines Syndrome”



Recent Origin and Evolution

- Fenwick (F) and Assateague Island (AI) were formed *after* the last “Ice Age” (LGM), when rising, post-glacial Holocene seas eroded sediment from the projecting Delaware headlands and that sediment was transported southward.
- *In all likelihood the islands were established ca. 5,000 yrs ago, as rising Holocene seas slowed their advance across the gently sloping Atlantic continental shelf. Sediment cores indicate their relative youth.*
- These barrier coasts are continually shifting, as wind-whipped waves, longshore currents, and rising seas continually move *limited inner shelf sand across the islands (bayward) and to the south (they are inherently dynamic).*
- At the southern end of AI there is a *growing, hooked portion of the island (Toms Cove, TC)* where southbound sediments are accumulating – one of the few such places.

