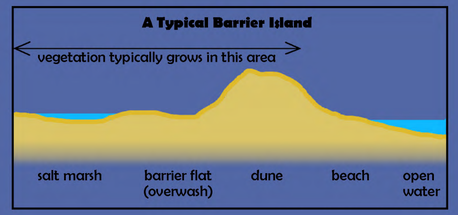
Virginia's Barrier Islands Provide a Unique Geologic Habitat

What are Barrier Islands?

Barrier islands are narrow offshore deposits of sediment that develop parallel to a coastline. They can be found all over the world, and can develop in chains hundreds of miles long. Tidal inlets allow the passage of ocean water between the islands, and the islands are separated from the mainland by a lagoon or bay. A typical barrier island consists of a **beach** deposited by ocean waves, **dunes** deposited by wind and stabilized by vegetation, a storm deposited **barrier flat** stabilized by vegeation, and a **salt marsh** which is flooded by tides, stabilized by vegetation, and acts as a natural filter to help purify mainland runoff.



Parramore Island, Virginia

High energy overwash flats

Barrier Islands as Habitat

Barrier islands are fragile ecosystems which need our protection. Each zone of the barrier island system presents a unique setting for plant and animal life. The **beach** is home to intertidal species such as algae, mole crabs, clams, and shore birds like pelicans and piping plovers. Within the **dunes**, vegetation including sea oats grow, stabilizing the sand from the wind with their roots. Crabs, gulls, and terns are common residents here. Within the **barrier flats**, cordgrass and sawgrass dominate the landscape, with clams and mussels, worms and snails, and small fish and crabs. Seagulls, pelicans, and egrets come and go to feed. Before the barrier island disappears into a lagoon or bay, a final strip of barrier island called a **salt marsh** exists. Here, many of the same species from the barrier flats live in peace.

Virginia's 23 barrier islands form a long chain along the Eastern Shore. As an undeveloped barrier island system, these islands protect the mainland from storms, provide critical habitat, and are considered an international biosphere reserve.

Loggerhead Sea Turtle

Piping Plover

High-tide Bush

Northern Bayberry

Globally rare maritime scrub communities

How Do They Form?

Barrier islands formed during the end of the last ice age, when the polar ice caps receeded and sea level increased, flooding coastal areas and depositing sediment. Barrier Islands require just the right balance of **sediment**, **wind**, **ocean currents**, **waves**, **tides**, **storms**, and **sea level change**. They are very dynamic - changing constantly depending on the influence of each of these variables.

Barrier Islands in Peril

Although barrier islands in Virginia are undeveloped, this is commonly not the case elsewhere in the world. Barrier islands are popular tourist locations. Not only are vacationers common, but barrier islands are also being developed into resort communities. However, barrier islands are fragile and dynamic ecosystems that are at risk from such development. Construction on barrier islands requires the destruction of the dunes, and the salt marshes to be filled, destroying the habitat and breaking down the house of cards that is the balanced barrier island system. This, in turn, results in a destabilized barrier island system that begins to erode away requiring constant human intervention in order to maintain the new 'beach resort' setting. Barrier islands naturally shift shape and position as sand is eroded, transported, and redeposited elsewhere within the system. These natural changes are not beneficial to development, and are therefor controlled by human engineering, although not always successfully. Tactics such as 'beach nourishment' (dredging up sand from elsewhere and depositing it on an eroding area) can help protect development or tourist sites, but are typically very expensive (millions of dollars) and are very short term solutions that do not last very long. A more sustainable practice may be to avoid development on barrier islands completely and preserve these ecosystems for other animal and plant life.

Ocean City, Maryland