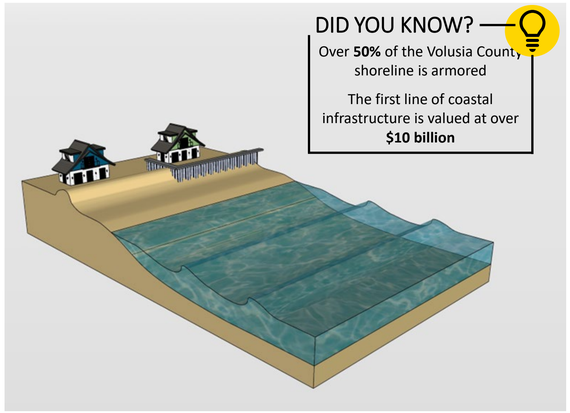
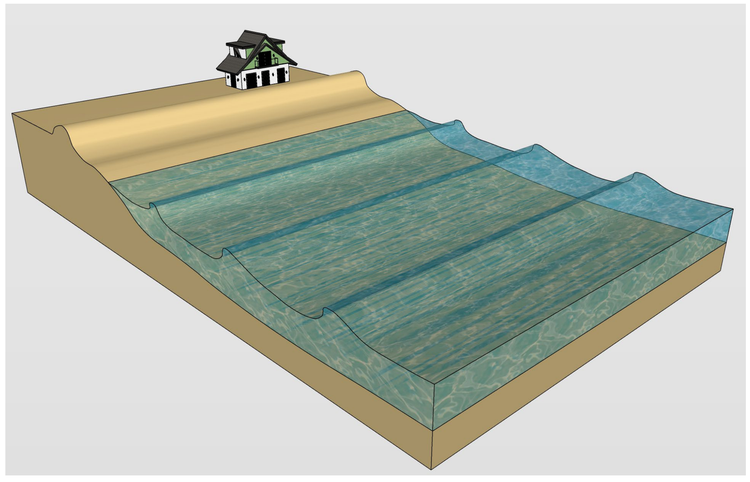
SHORELINE ALTERNATIVES

SHORELINE MANAGEMENT SOLUTIONS

The feasibility assessment will focus on the viability of different shoreline management alternatives and their ability to reduce coastal risk, provide benefits such as recreation improvements or habitat enhancement, and their constructability along the Volusia County shoreline. Implementing coastal solutions requires an assessment of their interaction with the natural environment. The shoreline management alternatives can be characterized as:

- *Natural or nature-based features*: focus on using natural processes or mimicking nature in their design
- *Structural features*: hardened engineered structures
- *Non-structural features*: modification of policy; flood proofing; structural elevation or relocation; etc.



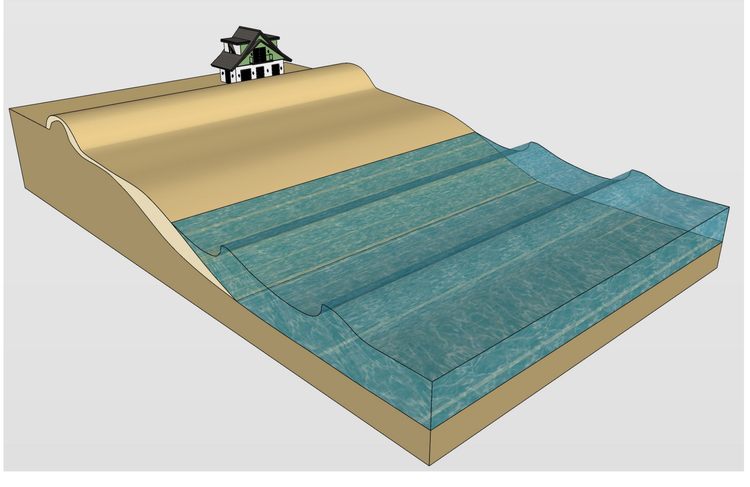


ALT 1- NO ACTION

non-structural feature

the community and decision-makers decide to let nature take its course

advantages	disadvantages
• no cost • minimal environmental disruption due to construction (but could lead to adverse erosion effects and hazards)	• high risk- potential for increased erosion; social hardships; loss of land; economic decline

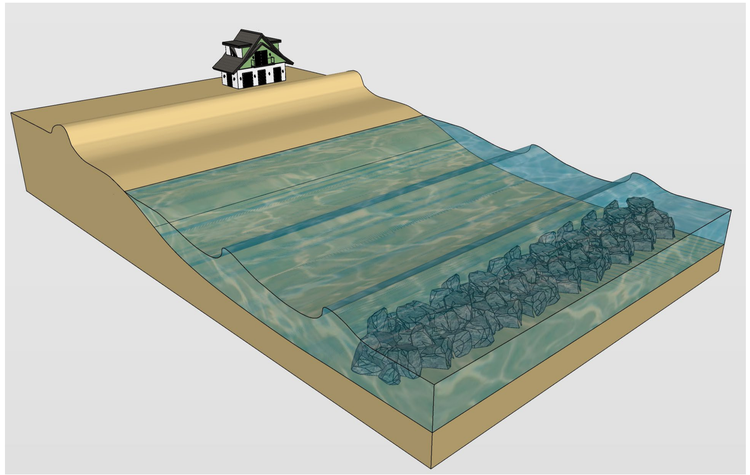


ALT 2- BEACH NOURISHMENT

natural or nature-based feature

placement of sand along the beach dune, berm, and nearshore areas to extend the beach seaward

advantages	disadvantages
• habitat and recreation benefits • increased, natural storm damage protection • adds sand to the system and downdrift beaches gain sand	• significant time needed and money required for planning and permitting • renourishment required; erosion is anticipated

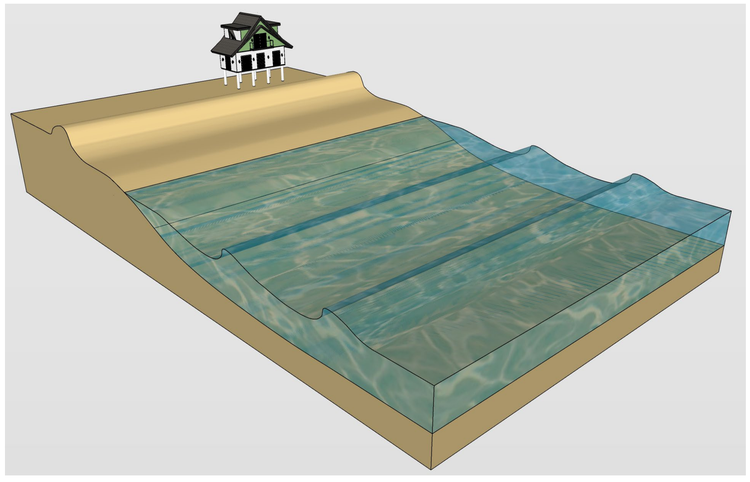


ALT 3- BREAKWATERS

structural feature

a series of rubble mound, rock breakwaters located in the nearshore; they are intended to break waves, and encourage sediment accretion

advantages	disadvantages
• decrease in wave action • potential to provide habitat • can cause sand accumulation	• can disturb recreation activities • adjacent erosion is common • if system is sand starved, the beach may not grow • limited storm damage protection

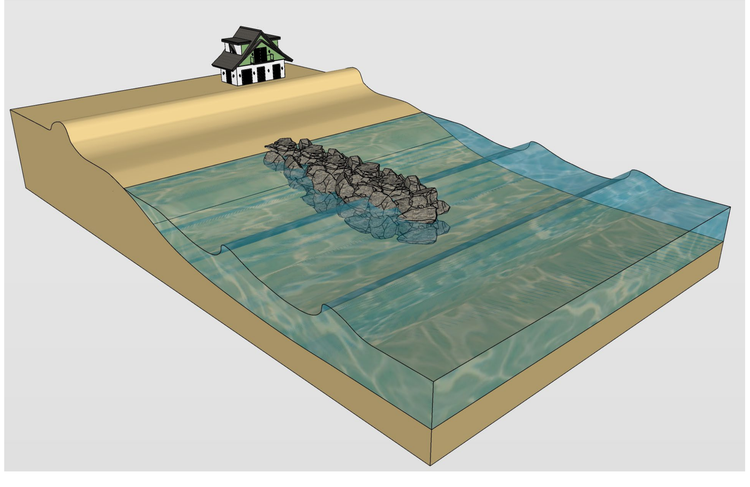


ALT 4- FLOOD PROOFING AND STRUCTURAL ELEVATION

non-structural feature

implementation of nonstructural solution(s) to protect from flooding; includes the use of flood barriers, raising grade, elevating structures, etc.

advantages	disadvantages
• tailored to infrastructure component • preservation of historic assets	• potential for high individual costs and lifestyle disruption • accessibility • design complexities



ALT 5- GROINS

structural feature

rubble mound rock structures located perpendicular to shore; these structures are intended to retain sand on the beach, slowing the downdrift movement of particles

advantages	disadvantages
• works well in areas with significant longshore transport	• often needs to be paired with beach nourishment for success • adjacent erosion is common • limited storm damage protection

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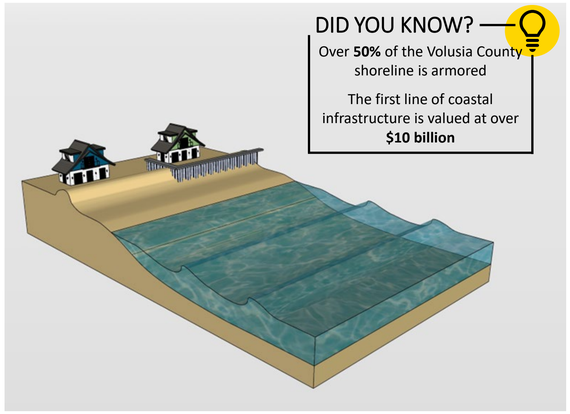
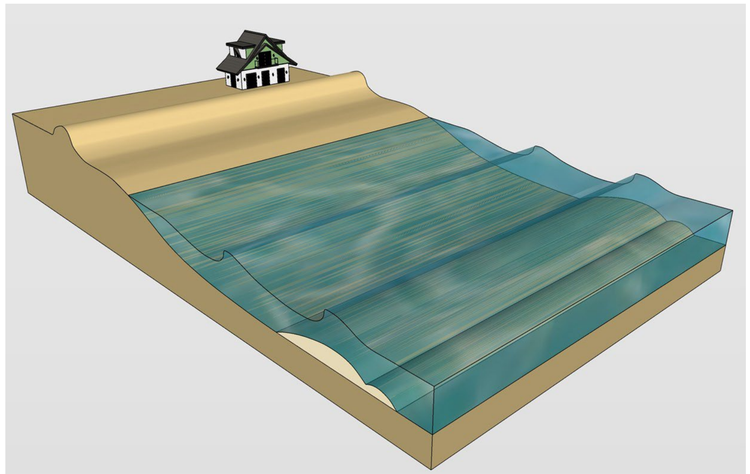


DID YOU KNOW?

Over **50%** of the Volusia County shoreline is armored

The first line of coastal infrastructure is valued at over **$10 billion**

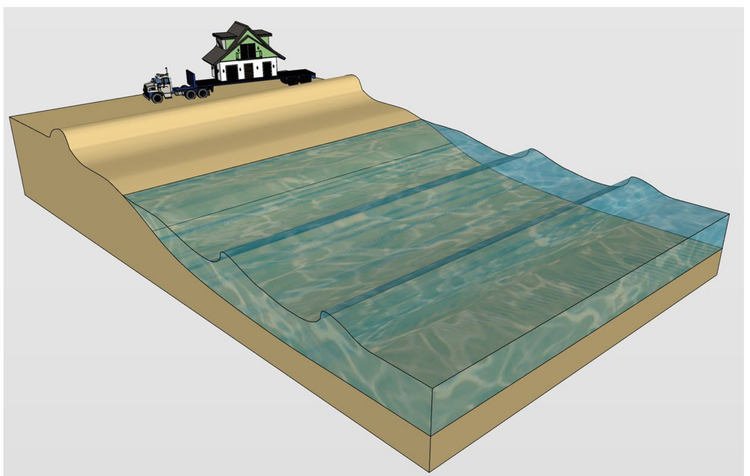


ALT 6- NEARSHORE SAND PLACEMENT

natural or nature-based feature

placement of sand in nearshore bars with the intention that waves will move the sand onshore to restore the beach

advantages	disadvantages
• less expensive than traditional beach nourishment • Requires less construction equipment	• efficacy is dependent on placement depth and wave conditions • less storm damage protection than traditional beach nourishment

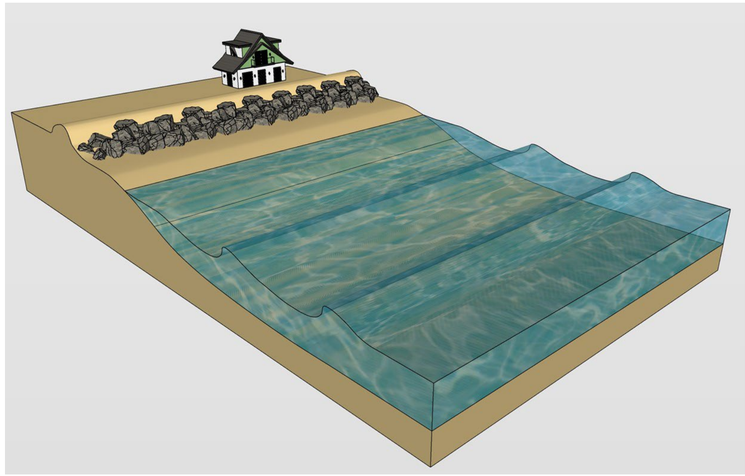


ALT 7- STRUCTURAL RELOCATION

non-structural feature

relocating structures inland and restoring the community to its natural state

advantages	disadvantages
• historic preservation (when applicable) • land use adaptation • reduced flood risk to the asset	• technical complexity leading to increased costs • potential disruption and damage • need community participation to reduce risk • social complexities

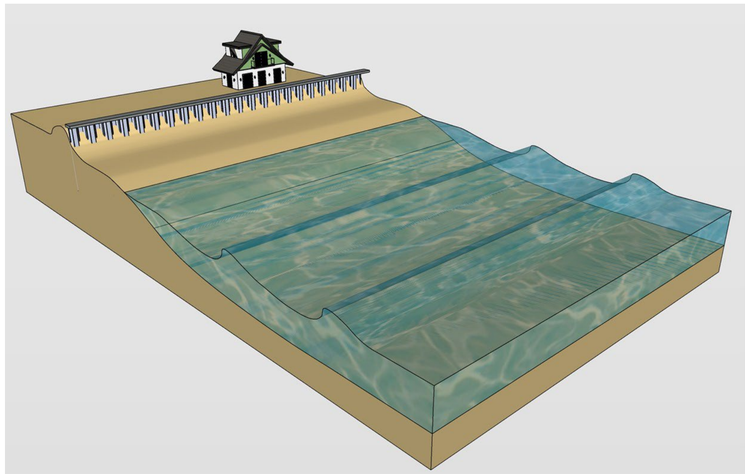


ALT 8- ROCK REVETMENTS

structural feature

a series of onshore rubble mound, rock structures placed on the beach, parallel to the dune

advantages	disadvantages
• reduces direct wave interactions with upland • easily adaptable	• prevents upland sediment movement and dune growth • reduces accessibility to the beach • erosion at structure toe may cause failure

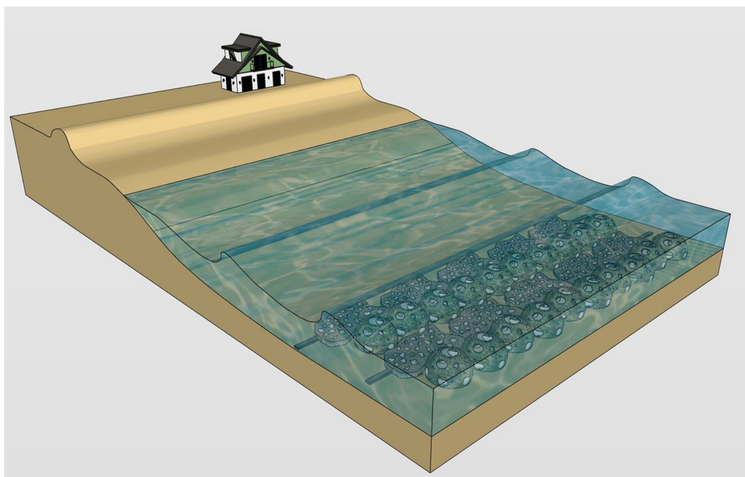


ALT 9- SEAWALLS

structural feature

a wall installed at the landward edge of the beach parallel to shore to protect upland infrastructure

advantages	disadvantages
• decreased flood risk to infrastructure • small footprint compared to other coastal defense strategies	• failure can be catastrophic • loss of sediment exchange across the dune • high upfront costs



ALT 10- NEARSHORE ARTIFICIAL REEFS

natural or nature-based feature

a series of biodiverse components that are located in the nearshore or offshore; similar to breakwaters, they are intended to break waves, and encourage sediment accretion

advantages	disadvantages
• decrease in wave action • provide habitat • recreation opportunity	• if system is sand starved, the beach may not grow • limited storm damage protection • large footprint