VIMS – CCRM Coastal Management Decision Tools

# Currently Defended Shorelines - Definitions

| Defense Types | |
|---|---|
| **Bulkhead** | A vertical structure that acts as a retaining wall usually constructed parallel to a shoreline. |
| **Revetment** | A sloped structure constructed with large, heavy stone or other material (riprap) placed against the upland bank for erosion protection. The size of a revetment should be dictated by the wave height expected to strike the shoreline. |
| **Bulkhead toe revetment** | A sloped stone structure placed on the channelward side of a bulkhead. |
| **Miscellaneous debris** | Concrete rubble, old bricks, or demolition debris used as substitute for quarry stone in revetment structures. |
| **Groins** | Structures placed perpendicular to the shoreline to capture material moving in the littoral zone and to accumulate sand along the shoreline. The sandy beach provides the desired erosion protection. |
| **Groin Field** | A series of several groins built parallel to each other along a beach shoreline. |
| **Marsh sill** | A low revetment placed offshore from an existing marsh, or in conjunction with placement of sand to expand an existing marsh or create a marsh where it does not occur naturally. |
| **Offshore breakwater(s)** | Series of large rock structures placed offshore to maintain a beach; where no beach or only a narrow beach exists, beach nourishment should be included. |
| **Unconventional defense structures** | Unique materials not commonly used or without established performance record, including but not limited to pre-cast concrete, well-casing groins, gabion baskets filled with stone, reef balls, oyster castles, "Sea-Bees", dry-stacked block walls, other engineered walls. |
| **Multiple Structures** | More than one type of structure present at same location, e.g. revetment or bulkhead and groins, revetment and offshore breakwater. |
| **Integrated vegetation buffers** | Create or enhance wetland and riparian buffer vegetation along gradient from mid-tide landward to upland area; allow native vegetation to grow without frequent mowing or add new wetland and riparian buffer vegetation, e.g. trees, shrubs, deep-rooted grasses, perennials, and ground covers. May require bank grading.<br>Replace waterfront lawn with ornamental grasses, native shrubs and small trees. |
| **Defense Structure Condition** | |
| **Structural Integrity** | The physical condition of a defense structure. |
| **Serviceable / No erosion** | Structure is undamaged and easy to repair; no erosion above, along toe or at ends of structure; of sound structural integrity. |
| **Failing** | Structure is losing integrity; structure shows signs of normal wear and tear.<br><br>Bulkheads: leaning, biodegradation, rotting timber, heavy cover of fouling organisms (barnacles, oysters or algae); loss of backfill (sinkholes) along top of bulkhead, missing sheet piles.<br><br>Revetments: slope is flat, stones are scattered above or channelward from original footprint, filter cloth is exposed. |
| **Flanked** | Erosion is visible behind, above or around end(s) of structure. |
| **Failed** | Structure is ineffective and no longer serves original purpose; structure has missing, broken or collapsed parts; also Dilapidated, Derelict |

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| Shoreline Conditions | |
|---|---|
| **Energy/Risk Level** | Combination of expected wave energy and threat to property, human health and safety; includes erosion risk and proximity of primary and accessory structures<br><br>**Low** –narrow fetch generally less than 0.5 mile, upper reaches of tidal creeks, tidal coves, limited navigation by motorized boats, no primary or secondary improvements in close proximity to shoreline, and/or minor erosion.<br><br>**Moderate** – fetch generally between ½-2 miles, some motorized boat traffic and boat wakes, primary or secondary improvements near shoreline, and/or active erosion.<br><br>**High** – fetch generally greater than 2 miles, major tributaries, open bays, Bayfront, numerous motorized boats and boat wakes that strike shore, and/or primary or secondary improvements in very close proximity to shoreline, and/or significant storm erosion. |
| **Beach present** | Shoreline type dominated by loose, unconsolidated sand.<br>**Wide beach** - generally includes area above Mean High Water elevation and higher than regular tidal action. |
| **Beach potential** | Shallow nearshore water depth and gradual intertidal slope is present where a created beach could be placed for sand buffer and offshore breakwaters. |
| **Shoreline length** | Length of shoreline currently defended or potentially defended, may include single or multiple parcels along reach with similar shoreline conditions. |
| **Nearshore water depth** | The vertical distance between the water surface and the submerged bottom usually referenced in feet below the mean low water elevation (e.g. – 2 ft MLW).<br><br>**Shallow -** at 30 ft. channelward from MLW, water depth is $\leq$ 3 ft.<br><br>**Deep -** at 30 ft. channelward from MLW, water depth is > 3 ft. |
| **Navigation condition** | Waterway depth and width allowances, presence or absence of motorized boats, natural or dredged channel.<br>**Navigation limited** refers to restricted channels, canals, boat basins, and/or mooring areas that limit ability to put a defense structure further channelward. |
| **Other Actions & Terms** | |
| **Inspect and maintain** | Periodically check condition and repair existing structure in current footprint. |
| **Modify upland land use** | Reduce risk by changing location or elevation of upland structures and improvements, e.g. house moving, house raising, driveway relocation, hook up to public sewer; may include variance requests for setbacks, other zoning restrictions. |
| **Grade bank** | Reduce the steepness of a slope to allow for wave run-up and to improve vegetation growing conditions; ability to grade may be limited by upland structures or dense vegetation providing desirable ecosystem services. |
| **Beach nourishment** | Placement of good quality sand along a beach shoreline to increase the beach width and raise the elevation of the nearshore area. |
| **Landward** | Location toward upland. |
| **Channelward** | Location toward water. |