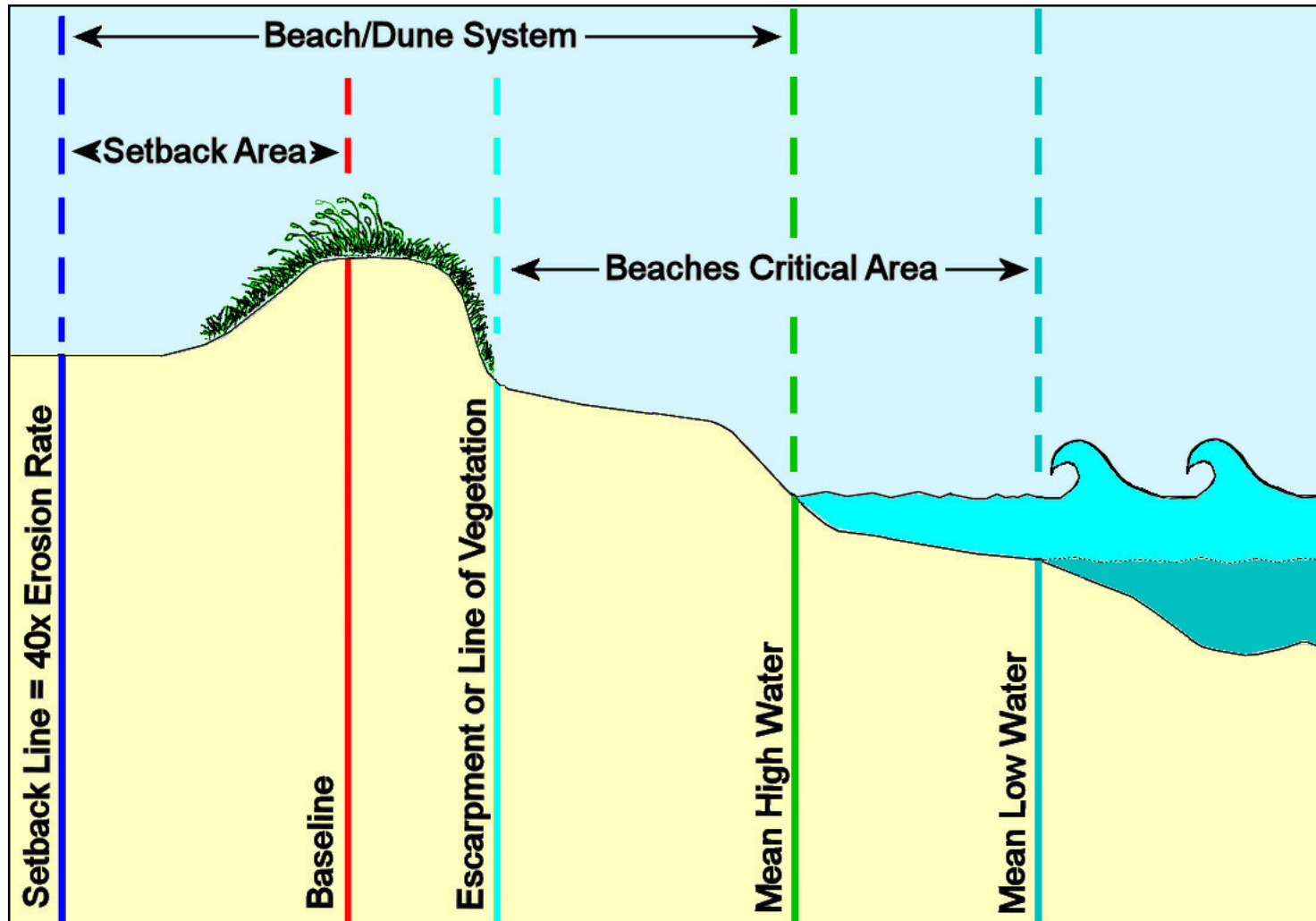




Sediment Transport & Sand Dune Formation



Beach Profile & OCRM CA Jurisdiction



Small Wave Activity (Summer)

- Long-period, small swells move sediment toward shore where it accretes on the berm.
- Wider beach.

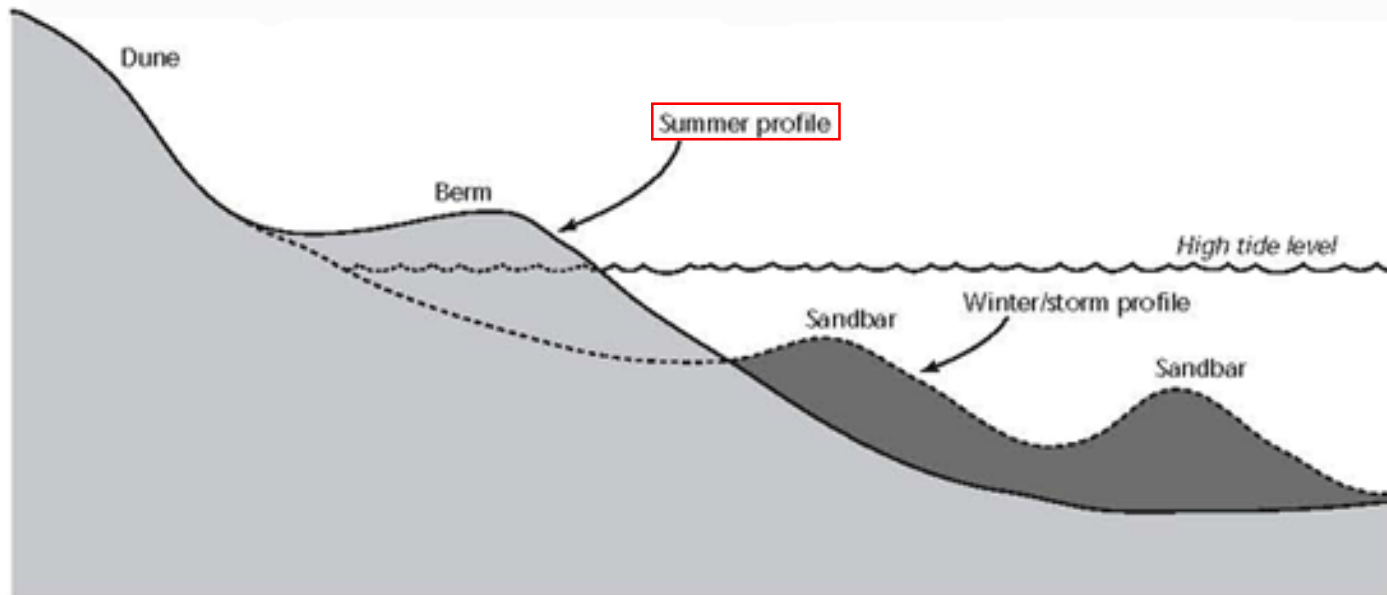


Figure A: Typical summer and winter beach and dune profiles.

Larger Wave Activity (Winter)

- Sediment moved away from shore and forms offshore bars.
- Narrower beach.

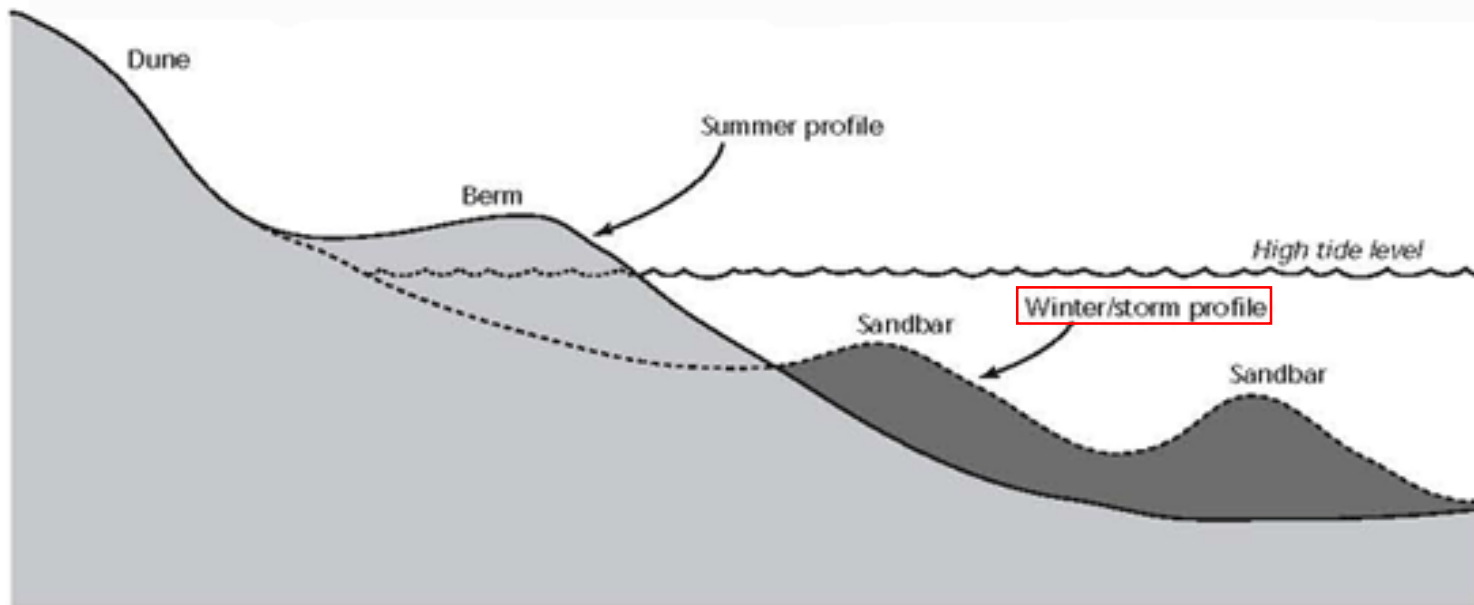
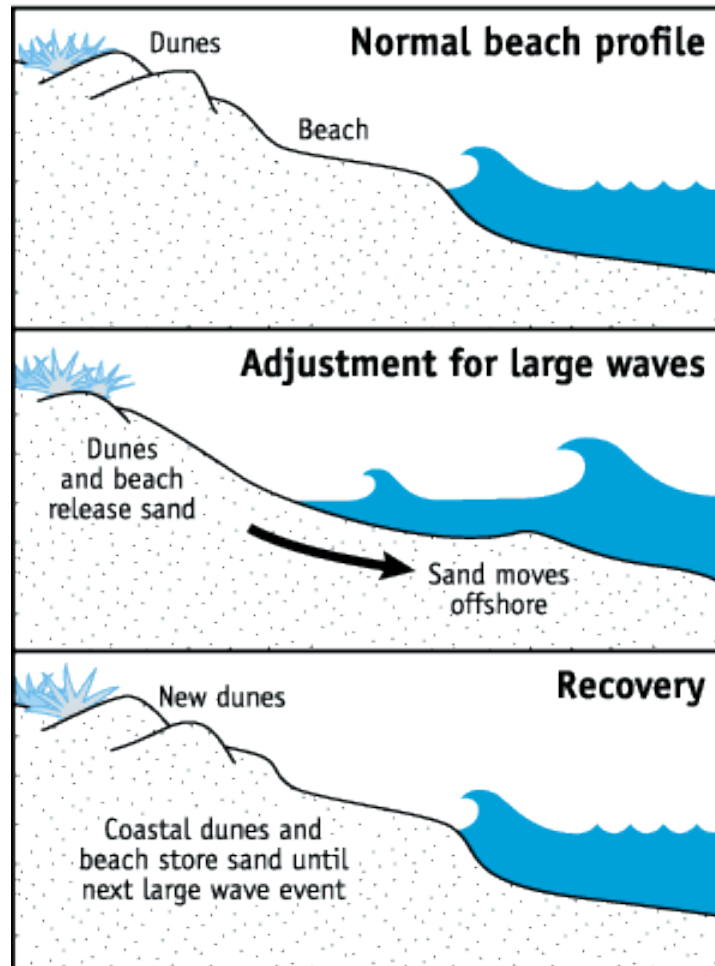


Figure A: Typical summer and winter beach and dune profiles.

Sand Dune Storm Response

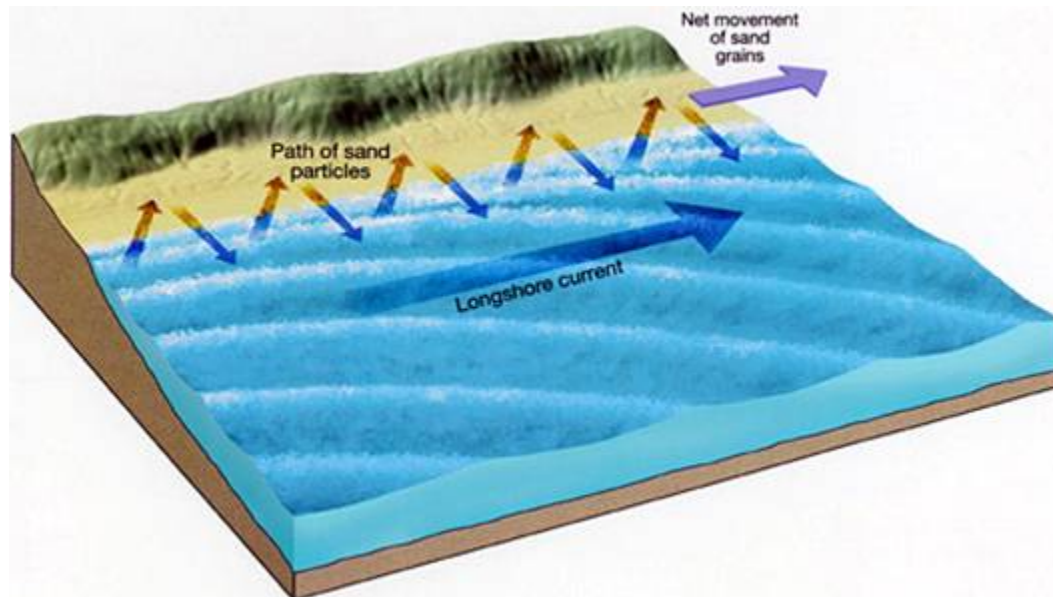


Sand Dune Continuity



Longshore Sediment Transport

- Wave refraction causes water and sand to move parallel to shore.
- Zigzag motion in surf zone.
 - Swash at small angle
 - Backwash straight back down the beach face



Sediment Transport

Bedload Transport

- Sediment particles bounce or roll along the shoreface.

Suspended Load Transport

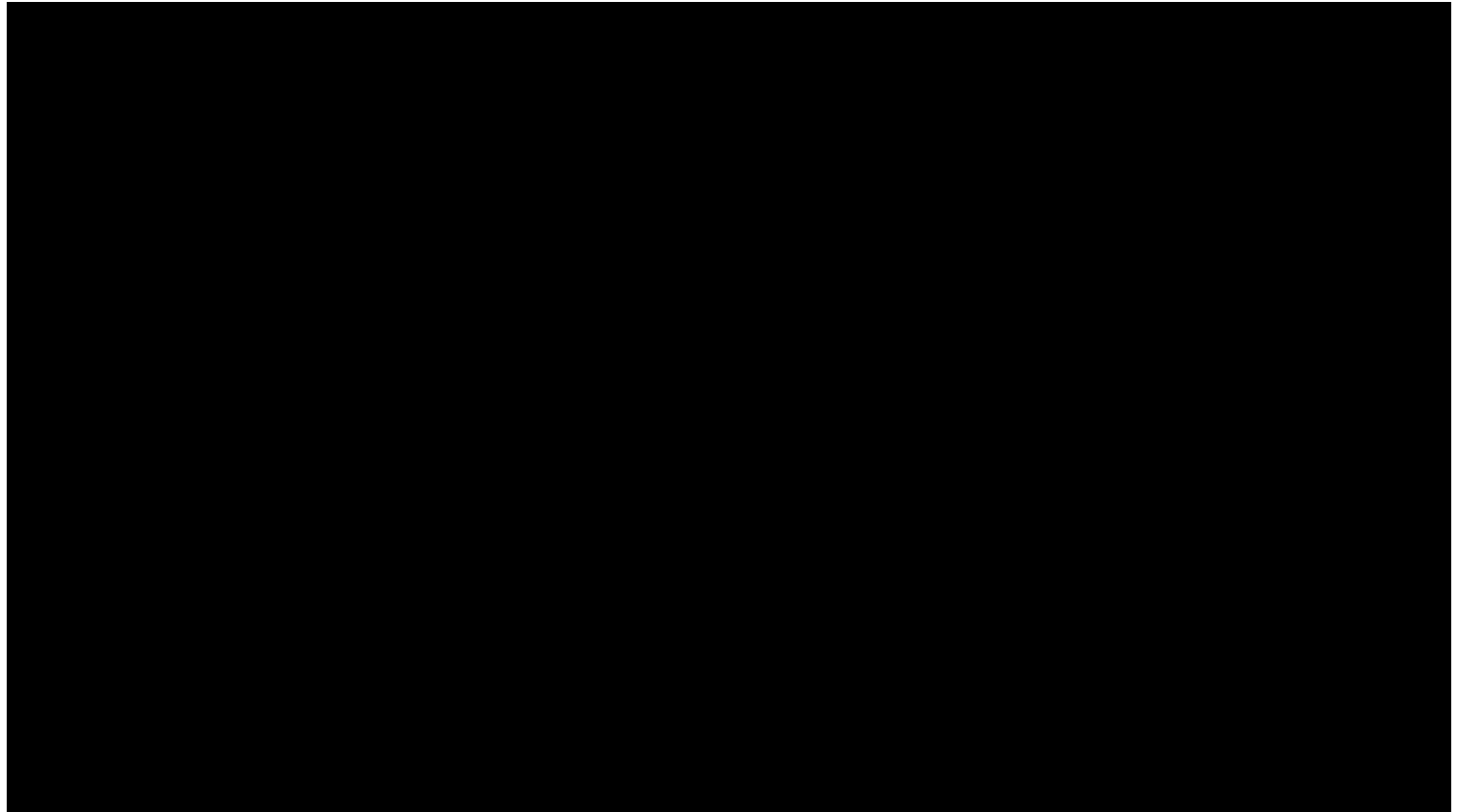
- Sediment particles are entrained within the water column.

Aeolian Transport

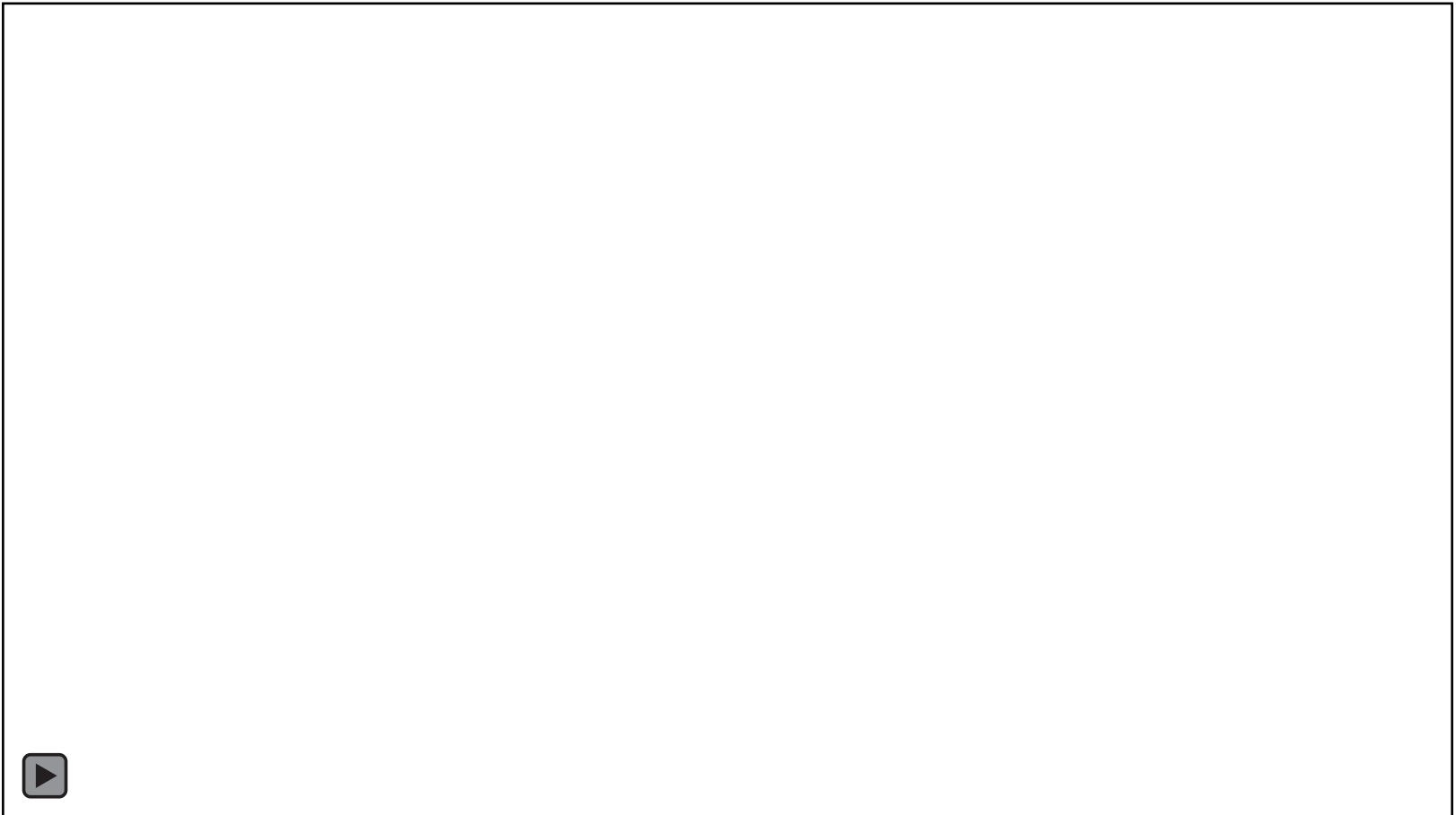
- Sediment particles are moved by the wind.
- This is the primary process driving coastal dune formation.



Bedload & Suspended Load Transport



Aeolian Transport



Aeolian Transport



Aeolian Transport



Aeolian Transport



Sand Fencing & Dune Plantings



Sand Dune Formation

Wide Range of Characteristics

- Dunes can range in height from a few feet to several hundred feet.
- Dunes can range in length from tens of feet to several miles.
- Dunes can be isolated hummocks, linear ridges, or groups of varying sizes and orientations called dune fields.

Sediment availability is key

- Dry sand beach is needed for dunes to form.
- Infrequent inundation.



South Carolina Department of Health and Environmental Control
Healthy People. **Healthy Communities.**

Jockey's Ridge – Nags Head, NC



Dune Hummocks



Linear Dune Ridge



Dune Field



Historical Dunes



Habitat: Beaches & Dunes





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