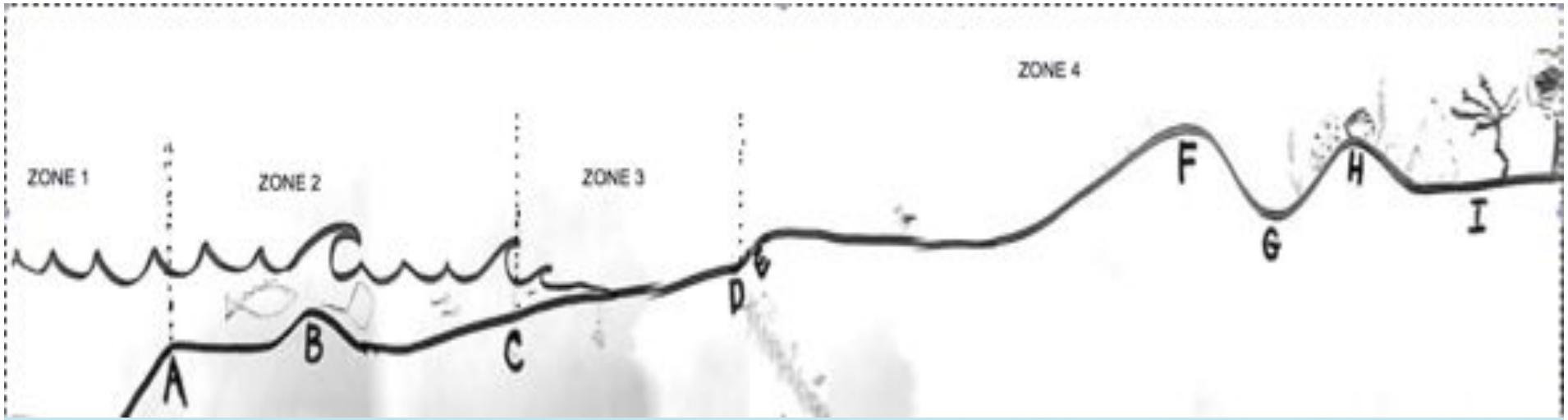
ZONES of the SANDY BEACH

HOW PHYSICAL FACTORS INFLUENCE BIOLOGICAL CHARACTERISTICS



Zone 1: Oceanic Zone

Zone 2: Subtidal/ Neritic Zone

Zone 3: Intertidal/ Littoral Zone

Zone 4: Supratidal Zone/ Upper Beach

A: Continental Shelf
B: Offshore Bar
C: Low-tide mark
*D: High-tide mark
*D: Wrackline/ Strandline
E: Scarp
F: Primary dune
G: Swale
H: Secondary dune
I: Maritime forest

Oceanic Zone

- Area of very deep water, extending from the deep sea to the continental shelf (A)
- Much marine life lives here, but not as much as in the neritic zone.

Neritic Zone
Subtidal Zone

- Area constantly submerged underwater, from the continental shelf (A) to the low-tide mark (C).
- Offshore bars (B) will be found in this zone. This is simply a shifting pile of sand caused by wave and current action.
- Longshore currents and waves will shape this zone.
- The neritic zone supports more marine life than the oceanic zone because there are more nutrients present.

Neritic Zone
Subtidal Zone

- Heavy waves and fast currents
- Must be able to swim; or to be able to cling on, burrow, or have some other method to try and avoid moving water.




Intertidal Zone
Littoral Zone

- This zone is exposed at low-tide, and submerged at high-tide. Therefore it extends from the low-tide mark (C) to the high-tide mark (D).
- The high-tide mark is where you will find the STRANDLINE or WRACKLINE (also D). This is a line of debris washed in with the tide.
- The scarp (E) is a steep slope caused by wave action at high tide. The scarp is steeper in the winter.

Intertidal Zone
Littoral Zone

Supratidal Zone
Upper Beach Zone

- This area is not submerged except during extreme high tides or severe storms.
- It is **not** subject to wave action and periods of submersion like the other zones, but **still** experiences strong winds and salt spray.
- It includes all features above the high-tide mark, including the dunes (F & H), the swale (G), and the maritime forest (I).

Primary Dune

- This is the first dune to form, closest to the shoreline.
- It is very difficult for plants to take root because of the shifting sand, wind, and salt spray

Primary dune:
PIONEER SPECIES

- Plants that form the dunes must take root quickly and tolerate very harsh, dry conditions.

Swale: valley between the dunes

- This area is protected from some of the wind and salt spray by the primary dune.
- It may be warmer than either dune because of the refraction of sunlight.

Secondary Dune

- This dune is further from the sea, and is protected by the primary dune.
- It experiences less wind and salt spray, so more species can grow here.
- This is still a very harsh environment, but not nearly as harsh as the primary dune the experiences the brunt of the environmental forces.

Maritime forest

- Far enough removed (and protected by the dunes) from the forces of the sea for trees and other plants to grow.
- However, the salty, dry substrate and still harsh conditions deter the growth of the fragile species found in an inland forest.
- This zone is often not visible in coastal cities because of development (houses and other buildings).

Maritime Forest

Importance of Dunes

- Dunes protect coasts from storms.
- This is why artificial dunes are being built all over the Rockaways.

Volunteer Event:
community service or extra credit
Long Beach dune planting