# **GLOSSARY**

The belly or cavity containing the digestive Abdomen

and reproductive organs

Growth in size; a growing together of separate Accretion

things; things added

Adipose Of, like, or containing animal fat; fatty

Gather together in one mass; a growing Aggregate

together in one area

A sac filled with gas, lying beneath the Air Bladder

backbone, in or behind the abdominal cavity;

also known as a swim bladder

To ascend rivers from the sea for breeding Anadromous

purposes

Anal Pertaining to the anus or vent

Anal Fin The fin on the median line behind the vent

or anus

Anterior The front; pertaining to the head region

The end toward which the beaks point in a Anterior End

bivalve shell; opposite the posterior

The principle opening of the body whorl in a **Aperture** 

gastropod shell

The tip or point Apex

The main stem or center line of any structure Axis

Barbel An elongated, fleshy projection, usually near

the head: also called a whisker

**Benthic** Pertaining to sea floor environments

Benthic Organisms Those animals which live in or on the sea floor

Containing less salt than normal sea water, Brackish

but undrinkable

The last whorl of a snail shell **Body Whorl** 

**Brood Pouch** A pouch where eggs or embryos develop

A series of thread-like filaments that anchor a **Byssus** 

bivalve to some other surface or substrate

Calcite A composition of sea shells; commonly colorless, white, or yellow, but may be of any color; transparent to opaque; vitreous Callus Lobe A hardened or thickened part Canines Long, conical teeth Cartilaginous Of or like the tough, elastic, whitish animal tissue cartilage Caudal Pertaining to the tail Caudal Fin The fin tail Caudal Peduncle The region between the anal and caudal fins Cheliped The claws of an arthropod Columella The pillar around which the whorls form their spiral circuit Compressed Flattened from side to side Concave Hollow and curved inward Concentric Curved ridges or lines on a bivalve shell which form arcs with beaks at the center A channel for conducting the flow of water or Conduit other fluid

Conical Having the shape of a cone

Cuesta A rock-like cap composed of sand and gravel

cemented together; found on top of the

Highlands of the Navesink

Chondrophore A spoon-shaped structure

A shell-like plate under the beaks; also called Deck

the platform

Denticle A small tooth or tooth-like projection

Depressed Flattened vertically

Dextral On the right-hand side; right-handed

Dorsal Pertaining to the back; the back region of a

fish body

Dorsal Fin The fin located on the median line of the back

Dusky Dark in color

Elongated Long and narrow

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		COLUMN TO THE PARTY OF THE PART		
Estuary Feelers	An inlet or arm of the sea consisting of a mix of fresh and salt water  A sensory extension; antennae		Hornblende	A group of complex silicates composed of calcium, magnesium, iron and aluminum; black to light green, may be opaque; highly vitreous luster on cleavage surfaces
Filament	A very slender thread or fiber		Intertidal	The zone between high and low tide level
Fin Membrane	A thin layer of tissue surrounding the fin		Inundated	Flooded; deluged, covered over
	connecting adjacent structures		Jetty	A sea wall built out into the water to restrain
Foreshore	Beach face; the section of beach on which waves break			currents, catch drifting sand and defract wave energy away from the shore
Frond	A leaf-like structure, but lacking the complex internal structure of a true leaf		Lateral	Referring to the side
Garnet	A silicate mineral; commonly red, brown, or yellow; translucent to opaque; with a resinous	Later	Lateral Line	A series of mucus pores along the side of the
				fish, containing sense organs; often appears as a colored or whitish stripe
	to vitreous luster		Lattice	A structure of crossed open spaces
Geomorphology	The branch of science dealing with the study of coastal processes and shoreline changes		Littoral	Pertaining to the tidal zone
Gills	Organs for breathing air contained in water		Littoral Drift	The current flowing along the shoreline; the
Gill Covers	The fold of skin providing external protection for the gills; may be reinforced by boney plates and covered with scales			major way for transporting sand along the coastline
			Lobe	A curved or rounded projection or division on
Gill Rakers	A series of boney projections along the inner			an organ
	edge of the gill arch		Lunule	A depressed area, usually heart-shaped, in front of the beaks in many bivalve shells
Glauconite	Clay-like limestone; also called marl		Luster	The surface quality of a mineral depending on
Globose	Rounded; subspherical			the kind and intensity of light it reflects; gloss
Growth Lines	Lines on the surface of a shell indicating periods between growth; also called growth laminae	Mantle	Mantle	A membranous flat or outer covering of the soft parts of a mollusc; secretes material to
				form the shell
Headland	A land mass of the highest elevation in relation to areas surrounding a large body of water; i.e., the ocean		Margined	Bordered or edged
			Magnetite	A combination of iron oxides; black, opaque, metallic luster; strongly attracted by a magnet;
Hematite	Ferric iron oxide; rarely found in well-formed crystals; steel gray, reddish-brown, red, or iron black with a metallic to earthy luster; the most important iron ore			an important iron ore
		-	Membranous	Thin and sheet-like
			Midline	A middle line
Hillock	A little hill		Midrib	A thickened central rib within the frond
Holdfast Hook or Hooked Spit			Mottled	Marked with blotches, streaks or spots of different colors or shades
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Mucilage	Thick, sticky substance produced in certain	Periostracum	A skinlike, outermost covering on many shells
Muscovite	plants White mica; a complex potassium aluminum	Photosynthesis	The manufacture of food from carbon dioxide and water via chlorophyll and light
assavite	silicate; thin, scale-like crystals; transparent to translucent with a pearly to vitreous luster	Photosynthetic	Capable of photosynthesis
Nematocyst	Any of the intracellular stinging structures	Phylum	A taxonomic category or group of animals
.'	characteristic of all coelenterates; i.e., jellyfish	Plankton	Drifting organisms that cannot swim against
Neural Arch	That part which encloses the vertebral opening surrounding the spinal cord		ocean currents; includes phytoplankton, (plants) and zooplankton, (animals)
Nutrient	Nourishment; food	Posterior	Pertaining to the tail; opposite the head region
Obliquely	Slanting position, neither perpendicular nor horizontal [/]	Proboscis	A snout or trunk, with distinct structural characteristics
Ocellated	Spotted; having an ocellus or several ocelli	Pseudorostrum	Beak-like extension between the eyes of an arthropod
Ocellus	An eye-like spot; a dark spot with a lighter border	Quartz	Silicon dioxide (rock crystal); commonly colorless or white, but may be yellow, pink,
Opaque	Impervious to light; light cannot pass through		smokey/translucent brown or black; trans-
Operculum	The horny or calcareous structure formed by and attached to the foot, covering the opening		parent to opaque with a vitreous to greasy luster
0.13	of some gastropod shells	Radiating	Applied to the ribs or lines that start at the beak and extend outward to the margins in a
Orbit	Eye socket of a crab, lobster, or shrimp		fan-like configuration
Oscula/Osculum	An opening or pore in a sponge through which water exits	Radula	The "tongue" or dental apparatus of gastropods
Ostium	An opening or pore in a sponge through which water enters, usually smaller than the oscula	Ray	One of the boney or cartilaginous supports of a fin; either spiny or soft, simple or branched
Parapodia	One of the unjointed, lateral series of rudi- mentary limbs of many worms, such as	Receptacle	A fertile branch tip bearing cavities in which reproductive cells are produced
Dools	annelids, used for locomotion	Recurved Spit	When the end of a spit of land is deflected
Peak Pectoral	The initial or earliest part of a bivalve shell Pertaining to the breast		towards the shore by offshore currents or by the opposing action of two or more currents;
Pectoral Fins	Frontal, breast fins; corresponding to the		i.e., Sandy Hook
	frontal limbs of the higher invertebrates	Resilifer	The socket-like structure that supports the internal ligament in certain bivalves
Peduncle	A depressed area, usually heart-shaped, in front of the beaks in many bivalve shells	Resilium	The internal ligament, in a resilifer, under
Pelagic	Free-swimming		compressed stress
Peninsula	A land mass surrounded by water on three sides	Rhizoidal	Root-like filaments which attach a plant to the substratum
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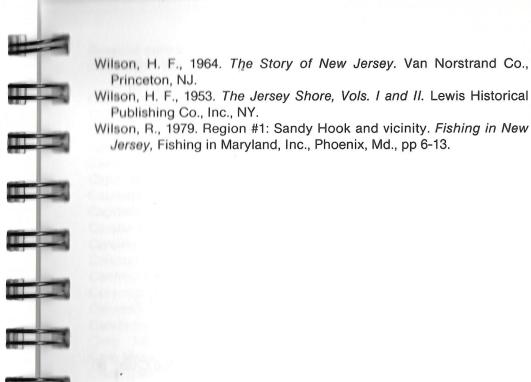
Rhizome	A roof-like subterranean stem, commonly horizontal in position; usually produces roots below and sends up shoots to the upper surface	Subtidal	Occurring below low tide level
		Suture	A seam line or junction of contiguous parts, such as the closure line or two bivalve shells
Ridge and Runnel	Method by which a beach zone is built up during spring and summer; caused by low wave energy conditions	Thallus	The whole plant
		Thorns	Sharp, pointed structures on a fish
Roe	The eggs of a fish, especially while bound together in a mass	Translucent	Allowing light to pass through, but not transparent or clear
Runnel	A trough or corrugation formed by waves or tidal currents in the foreshore or the bottom	Tubercles	A small, rounded elevation on the surface of a shell
Calinia	immediately offshore	Umbilicus	A navel-like formation; indicates a point of attachment
Salinity	A measure of the quantity of dissolved salt in sea water	Undulation	Bending in gradual curves; wave-like; an up and down or side to side motion
Salt Marsh	Peat; poorly-drained coastal swamps that are flooded by most high tides; a mixture of clays, silts, and sea grass roots	Vascular Cylinde	Pertaining to the conducting tissues of the plant axis
Scales	Thin, flat, overlapping, rigid, horny plates forming the outer protective covering of fish	Vector.	A complex quantity possessing both magnitude and direction; represented by a system of
Setae	A stiff hair; a bristle; a bristle-like part	Veliger	equal or parallel line segments
Segmented	Divided into parts or sections	Vent	The larval form of an oyster; juvenile
Sinuous	Having many curves, bends, or turns; winding	Ventral	The external opening of the rectum
Snout	That portion of the head which projects beyond the eyes	Ventral Fins	The underside region; the belly  The paired fins behind, in front of or below the
Spherical	Globe-like in shape; round	Vanielo	pectoral fins
Spines	Sharp, pointed, protective outgrowths used	Vesicle	A small cavity or sac
	for defense and locomotion	Vitreous	Having a glassy appearance
Spire	The upper whorls, from the body whorl to the apex	Whorl	One of the turns of a spiral shell; shaped like a coil
Spit	A build-up of sand, sometimes coming from an eroding cliff and carried by longshore drift, to form a smooth, curved land mass	Wasting Disease	A disease which once nearly wiped out the eelgrass beds along the Atlantic Coast
Stolon	Horizontal branch or portion of a plant axis; usually occurs at ground level	2015 (102 de)	
Stoloniferous	Stolon-like or composed of stolons		
Stratum	A layer of material, such as sedimentary rock between other layers of rock		

## REFERENCES

- Arnold, A. F., 1968. *The Sea Beach at Ebb Tide,* Dover Publications, Inc., New York.
- Barnes, R. D., 1974. *Invertebrate Zoology*, 3rd Ed., W. B. Saunders Co., Philadelphia, PA.
- Bigelow, H. B. & W. C. Schroeder, 1953. Fishes of the Gulf of Maine. Fishery Bulletin of the Fish & Wildlife Service, v. 53, U.S. Government Printing Office, Washington, D.C.
- Biggs, R. B., S. D. Halsey & J. C. Kraft, 1973. Morphology and vertical sedimentary sequence models in holocene transgressive barrier systems. *Coastal Geomorphology*, Publications in Geomorphology, New York, pp 321-354.
- Bonsall, S., 1977. Coastal Notes No. R-4. The Fishing Industry of New Jersey, Center for Coastal and Environmental Studies, New Jersey, pp 1-7.
- Breder, C. M., 1948. Field Book of Marine Fishes of the Atlantic Coast, G. P. Putnam & Sons, New York & London.
- Brunenmeister, S. L. & N. Fotheringham, 1975. General shore and faunal features. *Common Marine Invertebrates of the Northwestern Gulf Coast*, Gulf Publishing Co., Houston, TX, pp 1-5.
- Cascone, C. A., 1979. Sandy Hook: Natural History Handbook. National Park Service, pp 16-25 (unpublished ms.).
- Cittadino, W. E., 1977. Investigator with the Post Intelligence Office at Fort Hancock during WWII (personal correspondence, Long Branch, NJ).
- Clark, J., 1974. Coastal Ecosystems. Ecological considerations for management of the Coastal Zone (pamphlet), the Conservation Foundation, Washington, D.C.
- Coates, D. R., 1973. *Coastal Geomorphology*, Publications in Geomorphology, New York, pp 8-10.
- Coates, D. R., 1973. Barrier islands. *Coastal Geomorphology*, Publications in Geomorphology, New York, pp 158-160.
- Collins, M., 1979. Review of commercial fishing in New Jersey and NJEDA's financial role in its development. NOAA publication, pp 16-24.
- Dahlgren, P. B., 1977. Geology of Monmouth County in brief. Bureau of Geology & Topography, Trenton, NJ, pp 1-23.
- Dawson, E. Y., 1956. How to Know the Seaweeds, W. C. Brown Co., Dubuque, IA.
- Dolan, R., 1973. Barrier islands: Natural and controlled. *Coastal Geomorphology*, Publications in Geomorphology, NY, pp 263-278.
- Dyson, J. L., 1972. Nature keeps the record. *The World of Ice*, Borzoi Books, NY, pp 190-220.
- Emerson, W. K. & M. K. Jacobson, 1976. *The American Museum of Natural History Guide to Shells*. Random House, NY.

- Fisher, J. J., 1973. Bathymetric projected profiles and the origin of barrier islands Johnsons shoreline of emergence revisited. *Coastal Geomorphology*, Publications in Geomorphology, NY, pp 161-179.
- Freeman, B. L. & L. A. Walford, 1976. *Angler's Guide to the U.S. Atlantic Coast*, Section III, Block Island to Cape May, NJ. U.S. Government Printing Office, Washington, D.C., pp 6-11.
- Freeman, B. L. & L. A. Walford, 1976. *Angler's Guide to the U.S. Atlantic Coast,* Sec. IV, Delaware Bay to False Cape, Va. U.S. Government Printing Office, Washington, D.C., pp 3-4.
- Freeman, B. L. & L. A. Walford, 1976. *Angler's Guide to the U.S. Atlantic Coast*, Section V, Chesapeake Bay. U.S. Government Printing Office, Washington, D.C., pp 6-7.
- Freeman, B. L. & L. A. Walford, 1976. *Angler's Guide to the U.S. Atlantic Coast,* Section VI, False Cape, Va., to Altamaha Sound, Ga. U.S. Government Printing Office, Washington, D.C., pp 8-11.
- Freeman, B. L. & L. A. Walford, 1976. *Angler's Guide to the U.S. Atlantic Coast,* Section VIII, St. Lucie Inlet, Fl., to the Dry Tortugas. U.S. Government Printing Office, Washington, D.C., pp 8-11.
- Gilluly, J., A. C. Waters & A. O. Woodford, 1968. The oceans. *Principles of Geology*, 3rd Ed., W. H. Freeman & Co., San Francisco, pp 334-367.
- Godfrey, P. J. & M. M. Godfrey, 1973. Comparison of ecological and geomorphic interactions between altered and unaltered barrier island systems in North Carolina. *Coastal Geomorphology*, Publications in Geomorphology, NY, pp 239-258.
- Goodson, G., 1976. Fishes of the Atlantic Coast. Marquest Colorguide. Gosmer, K., 1978. Field Guide to the Atlantic Seashore, Houghton Mifflin Co., Boston.
- Herald, E. A., 1961. Living Fishes of the World, Hamish Hamilton, Ltd., London.
- Hildebrand, S. F. & W. C. Schroeder, 1972. Fishes of Chesapeake Bay. Smithsonian Institution Publication, T. F. H. Publications, Inc., Neptune, NJ.
- Hillson, C. J., 1977. Seaweeds. Pennsylvania State University Press, University Park & London.
- Kummel, H. B., 1940. The Geology of New Jersey. The NJ Department of Conservation & Development, Geological Series Bulletin No. 50.
- May, J. P. & W. F. Tanner, 1973. The littoral power gradient and shoreline changes. *Coastal Geomorphology*, Publications in Geomorphology, NY, pp 43-60.
- McCormick, L. C., 1973. Causes of shoreline recession and advance on the south shore of eastern Long Island. *Coastal Geomorphology*, Publications in Geomorphology, NY, pp 61-71.

- McGrath, R. A., 1974. Microfauna census of Raritan Bay. Benthos of Raritan Bay, Soc. No. 24, 3rd Symposium, pp 1-38.
- McGraw-Hill, 1966. Encyclopedia of Science and Technology, Vol. 3, McGraw-Hill, Inc., p 87.
- McGraw-Hill, 1976. Dictionary of Technical Terms, McGraw-Hill, Inc.
- Morris, P., 1975. A Field Guide to Shells of the Atlantic and Gulf Coasts and the West Indies, 3rd Ed. Houghton Mifflin Co., Boston.
- Moss, G. J., Jr., 1964. The iconography of a barrier beach. *Nauvoo to the Hook*, Jersey Close Press, NJ.
- Moss, G. H., Jr., 1966. *Steamboat to the Shore,* Ploughshare Press, Sea Bright, NJ.
- National Ocean Survey, 1977. Tidal current charts for New York Harbor. Rockville, Md.
- National Park Service, Sandy Hook: A study of alternatives. Pamphlet, Department of the Interior, National Park Service.
- Niedoroda, A. W., 1973. Sand bars along low energy beaches. *Coastal Geomorphology*, Publications in Geomorphology, NY, pp 219-237.
- Petry, L. C. & M. G. Norman, 1968. A Beachcomber's Botany. Old Greenwich, CT.
- Quackenbush, G. A., 1955. Our New Jersey Land, NJ Agricultural Experimental Station Bulletin No. 775, New Brunswick, NJ.
- Ruzyla, K., 1973. Effects of erosion on barrier island morphology, Fire Island, New York. *Coastal Geomorphology*, Publications in Geomorphology, NY, pp 219-237.
- Schuberth, C. J., 1968. *The Geology of New York City and Environs*. Natural History Press, Garden City, NY.
- Shepard, F. P., 1973. Submarine Geology, 3rd Ed., Harper & Row, NY.
- Silberhorn, G. M., 1976. Tidal Wetland Plants. Educational Series No. 19, Institute of Marine Sciences.
- Smith, S. S., 1963. Sandy Hook and the Land of the Navesink, Phillip Freneau Press, Monmouth Beach, NJ.
- Teal, J., & M. Teal, 1969. *Life and Death of A Salt Marsh, Audubon/* Ballantine Books, NY.
- Tedrow, J. C. F., 1963. New Jersey soils. Rutgers College of Agriculture, New Brunswick, NJ, Circular 601.
- U.S. Government, 1971. Hearings before the Subcommittee on Parks and Recreation of the Committee on Insular and Interior Affairs. United States Senate, May 12-17, U.S. Government Printing Office, Washington, D.C.
- Villee, C. A., W. F. Walker, Jr., & F. E. Smith, 1963. *General Zoology*. W. B. Saunders Co., Philadelphia & London, pp 355-356.
- Widmer, K., 1964. The Geology and Geography of New Jersey. Van Norstrand Co., Princeton, NJ.



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