

GLOSSARY

100-year flood

the standard used by the National Flood Insurance Program (NFIP) for floodplain management purposes and to determine the need for flood insurance; a structure located within a special flood hazard area shown on an NFIP map has a 26 percent chance of suffering flood damage during the term of a 30-year mortgage

A Zone

areas inundated in a 100-year storm event that experience conditions of less severity than conditions experienced in *V Zones*

access, lateral

the right to walk or otherwise move along a *shoreline*, once someone has reached the *shore*

access, perpendicular

a legally permissible means of reaching the *shore* from dry land

access point

a place where anyone may legally gain access to the *shore*; usually a park, the end of a public street, or a public path; a place where perpendicular access (see *access, perpendicular*) is provided

accretion

the accumulation of a sedimentary deposit that increases the size of a land area; this increase may be either lateral or vertical

armoring

the placement of fixed engineering structures, typically rock or concrete, on or along the *shoreline* to mitigate the effects of coastal *erosion* and protect infrastructure; such structures include *seawalls*, *revetments*, *bulkheads*, and *riprap*

avulsion

a sudden cutting off or separation of land by a flood or by an abrupt change in the course of a stream; as by a stream breaking through a meander or a sudden change in current whereby a stream deserts its old channel for a new one; OR rapid *erosion* of the *shore* by *waves* during a storm

barrier island

a long, narrow coastal sandy island that is above high tide and parallel to the *shore*, and that commonly has *dunes*, vegetated zones, and swampy terraces extending landward from the *beach*

barrier island rollover

the landward migration or landward *transgression* of a *barrier island*, accomplished primarily over decadal or longer time scales through the process of storm *overwash*, periodic inlet formation, and wind-blown transport of sand

barrier migration

the movement of an entire *barrier island* or *barrier spit* in response to sea-level rise, changes in sediment supply, *storm surges* or *waves*, or some combination of these factors

barrier spit

a *barrier island* that is connected at one end to the mainland

bathymetry

the measurement of ocean depths and the mapping of the topography of the seafloor

beach

the unconsolidated material that covers a gently sloping zone extending landward from the low water line to the place where there is a definite change in material or physiographic form (such as a cliff), or to the line of permanent vegetation (usually the effective limit of the highest storm waves)

beach nourishment

the addition of sand, often dredged from offshore, to an eroding *shoreline* to enlarge or create a *beach* area, offering both temporary *shore protection* and recreational opportunities

berm

a commonly occurring, low, impermanent, nearly horizontal ledge or narrow terrace on the backshore of a *beach*, formed of material thrown up and deposited by storm waves

bluff

a high bank or bold headland with a broad, precipitous, sometimes rounded cliff face overlooking a plain or body of water

breakwater

an offshore structure (such as a wall or *jetty*) that, by breaking the force of the waves, protects a harbor, anchorage, *beach* or *shore* area

breach

(n.) a channel through a *barrier spit* or island typically formed by storm waves, tidal action, or river flow; breaches commonly occur during high *storm surge* cause by a hurricane or *extratropical storm*; (v.) to cut a deep opening in a landform

bulkhead

a structure or partition to retain or prevent sliding of the land; a secondary purpose is to protect uplands against damage from wave action

coastal plain

any lowland area bordering a sea or ocean, extending inland to the nearest elevated land, and sloping very gently seaward

coastal zone

the area extending from the ocean inland across the region directly influenced by marine processes

coastline

the line that forms the boundary between the coast and the *shore* or the line that forms the boundary between the land and the water

continental shelf

the gently sloping underwater region at the edge of the continent that extends from the beach to where the steep continental slope begins, usually at depths greater than 300 feet

continental margin

the region of the sea floor between the *shoreline* and the deep abyssal ocean, see *margin, active* and *margin, passive*

contour interval

the difference in elevations of adjacent contours on a topographic map

current

the horizontal movement patterns in bodies of water; in coastal areas, currents are influenced by a combination of tidal (flood and ebb) and nontidal (wind-driven, river flow) forces

datum

a quantity, or a set of quantities, that serves as a basis for the calculation of other quantities; in surveying and mapping, a datum is a point, line or surface used as a reference in measuring locations or elevations

delta

a low relief landform composed of *sediments* deposited at the mouth of a river that commonly forms a triangular or fan-shaped plain of considerable area crossed by many channels from the main river; forms as the result of accumulation of *sediment* supplied by the river in such quantity that it is not removed by tidal or wave-driven currents

DEM (digital elevation model)

the digital representation of the ground surface or terrain using a set of elevation data

deposition

the laying, placing, or throwing down of any material; typically refers to *sediment*

depth of closure

a theoretical depth below which *sediment* exchange between the nearshore (beach and shoreface) and the continental shelf is deemed to be negligible

dike

a wall generally of earthen materials designed to prevent the permanent submergence of lands below sea level, tidal flooding of lands between sea level and spring high water, or storm-surge flooding of the coastal floodplain

discount rate

an assumed interest rate or rate of return used to calculate the present value of a future payment; in mathematical terms, the present value of receiving \$1 Y years hence is $1/(1-r)^Y$, where r is the discount rate

downdrift

the location of one section or feature along the coast in relation to another; often used to refer to the direction of net longshore sediment transport between two or more locations (*i.e.*, downstream)

dredge and fill

an engineering process by which channels are dredged through wetlands or uplands to allow small boat navigation, and dredge spoil is placed on the adjacent land area to raise the land high enough to allow development; sometimes referred to as “lagoon development” or “canal estates”; used extensively before the 1970s

dune

a low mound, ridge, bank, or hill of loose, wind-blown material such as sand; capable of movement from place to place but typically retaining a characteristic shape; may be either bare or covered with vegetation

ebb current

the *tidal current* associated with the decrease in height of the tide, generally moving seaward or down a tidal river or *estuary*, see also *flood current*

ebb tide delta

a large sand shoal commonly deposited at the mouths of tidal inlets formed by ebbing tidal currents and modified in shape by waves, compare with *flood tide delta*

erosion

the mechanical removal of sedimentary material by gravity, running water, moving ice, or wind; in the context of coastal settings erosion refers to the landward retreat of a *shoreline* indicator such as the water line, the berm crest, or the vegetation line; the loss occurs when *sediments* are entrained into the water column and transported from the source

erosion-based setback

a *setback* equal to an estimated annual *erosion* rate multiplied by a number of years set by statute or regulation (e.g., 30 years)

estuary

a semi-enclosed coastal body of water which has a free connection with the open sea and within which sea water is measurably diluted with freshwater from land drainage; an inlet of the sea reaching into a river valley as far as the upper limit of tidal rise, usually being divisible into three sectors; (a) a marine or lower estuary, in free connection with the open sea; (b) a middle estuary subject to strong salt and freshwater mixing; and (c) an upper or fluvial estuary, characterized by fresh water but subject to daily tidal action; limits between these sectors are variable, and subject to constant changes in the river discharge

extratropical storm

a cyclonic weather system, occurring in the middle or high latitudes (e.g., poleward of the tropics) that is generated by colliding airmasses; such weather systems often spawn large storms that occur between late fall and early spring

fetch

the area of the open ocean where the winds blow over with constant speed and direction, generating *waves*

flood current

the *tidal current* associated with the increase in height of the tide or the incoming tide, generally moving landward or up into a tidal river or *estuary*, see also *ebb current*

flooding

the temporary submergence of land that is normally dry, often due to periodic events such as storms, see also *inundation*

flood tide delta

a large sand *shoal* commonly deposited on the landward side of a *tidal inlet* formed by flooding tidal currents, compare with *ebb tide delta*

floodproofing

a set of techniques that are intended to limit the amount of damage that will occur to a building and/or its contents during a flood (see also *floodproofing, dry* and *floodproofing, wet*)

floodproofing, dry

a *floodproofing* technique in which modifications are made to allow floodwaters inside a building while ensuring that there is minimal damage to either the structure or its contents

floodproofing, wet

a *floodproofing* technique in which a building is sealed such that floodwaters cannot get inside the structure

forcing

to hasten the rate of progress or growth; in this report, forcing generally refers to climate change factors that act to alter a particular physical, chemical, or biological system (e.g., changes in climate such as greenhouse gas concentration, temperature, sea level, or storm characteristics)

geologic framework

the underlying geological setting, structure, and *lithology* (rock/sediment type) in a given area

geomorphology (geomorphic)

the external structure, form, and arrangement of rocks or *sediments* in relation to the development of the surface of the Earth

global sea-level rise

the worldwide average rise in mean sea level; may be due to a number of different causes, such as the thermal expansion of sea water and the addition of water to the oceans from the melting of glaciers, ice caps, and ice sheets; contrast with *relative sea-level rise*

groin

an engineering structure oriented perpendicular to the coast, used to accumulate *littoral* sand by interrupting *longshore transport* processes; often constructed of concrete, timbers, steel, or rock

high marsh

the part of a *marsh* that lies between the *low marsh* and the marsh's upland border; this area can be expansive, extending hundreds of yards inland from the low marsh area; soils here are mostly saturated but only flooded during higher-than-average astronomical tides (see *tides* and *tides, astronomical*)

high water mark (also called ordinary high water mark or mean high water mark)

a demarcation between the publicly owned land along the water and privately owned land which has legal implications regarding public access to the *shore*; generally based on mean high water, the definition varies by state; along beaches with significant waves, it may be based on the line of vegetation, the water mark caused by wave runup, surveys of the elevation of mean high water, or other procedures

hydrodynamic climate

the characteristics of nearshore or continental shelf *currents* in an area that typically result from *waves*, *tides*, and weather systems

inlet

a small, narrow opening, recess, indentation, or other entrance into a coastline or *shore* of a lake or river through which water penetrates landward; commonly refers to a waterway between two barrier islands that connects the sea and a *lagoon*

intertidal

see *littoral*

inundation

the *submergence* of land by water, particularly in a coastal setting, see also *flooding*

jetty

an engineering structure built at the mouth of a river or *tidal inlet* to help stabilize a channel for navigation; designed to prevent shoaling of a channel by *littoral* materials and to direct and confine the stream or tidal flow

lagoon

a shallow coastal body of seawater that is separated from the open ocean by a barrier or coral reef; the term is commonly used to define the shore-parallel body of water behind a *barrier island* or *barrier spit*

levee

a wall, generally of earthen materials, designed to prevent the flooding of a river after periods of exceptional rainfall

lidar (LIght Detection And Ranging)

a remote sensing instrument that uses laser light pulses to measure the elevation of the land surface with a high degree of accuracy and precision

lithospheric

of or pertaining to the solid portion of the Earth, including the crust and part of the upper mantle; the region of the Earth that is studied in plate tectonics

littoral

the zone between high and low tide in coastal waters or the *shoreline* of a freshwater lake

littoral cell

a section of coast for which sediment transport processes can be isolated from the adjacent coast; within each littoral cell, a sediment budget can be defined that describes sinks, sources, and internal fluxes

littoral transport

the movement of sediment *littoral drift* in the *littoral zone* by waves and currents; includes movement both parallel and perpendicular to the *shore*

littoral zone

the region of the *shore* that occurs between the high and low water marks

living shoreline

a *shore* protection concept where some or all of the environmental characteristics of a natural *shoreline* are retained as the position of the shore changes

long-lived infrastructure

infrastructure that is likely to be in service for a long time, and therefore may benefit from consideration of sea-level rise and *shoreline* changes in planning and/or maintenance

longshore current

an ocean *current* in the *littoral zone* that moves parallel to the *shoreline*; produced by *waves* approaching at an angle to the shoreline

longshore transport

the movement of *sediment* parallel to the *shoreline* in the *surf zone* by wave suspension and the *longshore current*

low marsh

the seaward edge of a *salt marsh*, usually a narrow band along a creek or ditch which is flooded at every high *tide* and exposed at low tide (see also *high marsh*)

margin, active

a *continental margin* located where the edges of *lithospheric* plates are colliding, resulting in tectonic activity such as volcanoes and earthquakes; also called a “Pacific margin” after the Pacific Ocean where such margins are common; compare with *margin, passive*

margin, passive

a *continental margin* located in the middle of a lithospheric plate (see *lithosphere*) where tectonic activity is minimal; also called an “Atlantic margin” after the Atlantic Ocean where such margins are common; compare with *margin, active*

marsh

a frequently or continually inundated *wetland* characterized by herbaceous vegetation adapted to saturated soil conditions (see also *salt marsh*)

mean high water

a *tidal datum*; the average height of high water levels observed over a 19-year period

mean higher high water

the average of the higher high water height of each tidal day observed over the *national tidal datum epoch* (see *national tidal datum epoch*)

mean sea level (MSL)

the “still water level” (*i.e.*, the level of the sea with high frequency motions such as wind *waves* averaged out); averaged over a period of time such as a month or a year, such that periodic changes in sea level (*e.g.*, due to the *tides*) are also averaged out; the values of MSL are measured with respect to the level of marks on land (called benchmarks)

metadata

a file of information which captures the basic characteristics of a data or information resource; representing the who, what, when, where, why and how of the data resource; geospatial metadata are used to document geographic digital resources such as Geographic Information System (GIS) files, geospatial databases, and earth imagery

moral hazard

a circumstance in which insurance, lending practices, or subsidies designed to protect against a specified hazard induce people to take measures that increase the risk of that hazard

mudflat

a level area of fine silt and clay along a *shore* alternately covered and uncovered by the *tide* or covered by shallow water

national geodetic vertical datum of 1929 (NGVD29)

a fixed reference adopted as a standard geodetic *datum* for elevations; it was determined by leveling networks across the United States and sea-level measurements at 26 coastal tide stations; this reference is now superseded by the North American vertical datum of 1988 (NAVD88)

national tidal datum epoch (NTDE)

the latest 19-year time period over which NOAA has computed and published official tidal *datums* and local mean sea-level elevations from tide station records; currently, the latest NTDE is 1983-2001

nearshore zone

the zone extending from the *shoreline* seaward to a short, but indefinite distance offshore, typically confined to depths less than 5 meters (16.5 feet)

nontidal wetlands

wetlands that are not exposed to the periodic change in water level that occurs due to astronomical tides (see *tides* and *tides, astronomical*)

nor'easter (northeaster)

the name given to the strong northeasterly winds associated with extra-tropical cyclones that occur along East Coast of the United States and Canada; these storms often cause beach *erosion* and structural damage; wind gusts associated with these storms can approach and sometimes exceed hurricane force in intensity

North American vertical datum of 1988 (NAVD88)

a fixed reference for elevations determined by geodetic leveling, derived from a general adjustment of the first-order terrestrial leveling networks of the United States, Canada, and Mexico; NAVD88 supersedes NGVD29

overwash

the *sediment* that is transported from the *beach* across a *barrier* and is deposited in an apron-like accumulation along the backside of the barrier; overwash usually occurs during storms when waves break through the frontal dune ridge and flow landward toward the *marsh* or *lagoon*

outwash plain

a braided stream deposit beyond the margin of a glacier; it is formed from meltwater flowing away from the glacier, depositing mostly sand and fine gravel in a broad plain

pocket beach

a small, narrow beach formed between two *littoral* obstacles, such as between rocky headlands or promontories that occur at the *shore*

Public Trust Doctrine

a legal principle derived from English Common Law which holds that the waters of a state are a public resource owned by and available to all citizens, and that these public property rights are not invalidated by private ownership of the underlying or adjacent land. In most states, the public trust rights include the land below mean high water. In five low water states, the public has an access right to intertidal land solely for the purpose of hunting, fishing, fowling, and navigation.

rebound

the uplift of land following deglaciation due to the mass of ice being removed from the land surface

relative sea-level rise

the rise in sea level measured with respect to a specified vertical *datum* relative to the land, which may also be changing elevation over time; typically measured using a *tide gauge*; compare with *global sea-level rise*

retreat

one of three possible responses to sea-level rise, which involves adapting to *shoreline* change rather than attempting to prevent it, generally by either preventing construction in a vulnerable area or removing structures already in the vulnerable area; the other two responses are various methods of *shore protection* or *floodproofing*

revetment

a sloped facing of stone, concrete, etc., built to protect a scarp, embankment, or *shore* structure against erosion by wave action or *currents*

river diversion

a set of engineering approaches used to redirect the flow of river water from its natural course for a range of purposes; commonly used to bypass water during dam construction, for flood control, for navigation, or for *wetland* and floodplain restoration

riprap

loose boulders placed on or along the *shoreline* as a form of *armoring*

rip current

a strong, narrow current of surface water that flows seaward through the surf into deeper water

rollover

see *barrier island rollover*

rolling easement

1. an interest in land (by title or interpretation of the *Public Trust Doctrine*) in which a property owner's interest in preventing real estate from eroding or being submerged yields to the public or environmental interest in allowing *wetlands* or *beaches* to migrate inland, usually by prohibiting shore protection. 2. a government regulation that preserves the environment and/or the public's access along the coast as shorelines retreat by requiring the removal of structures once they are inland of a defined high water mark (e.g. the dune vegetation line or mean high water)

root mean square error (RMSE)

a measure of statistical error calculated as the square root of the sum of squared errors, where error is the difference between an estimate and the actual value; if the mean error is zero, it also equals the standard deviation of the error

salt marsh

a grassland containing salt-tolerant vegetation established on *sediments* bordering saline water bodies where water level fluctuates either tidally or nontidally (see also *marsh*)

saltwater intrusion

displacement of fresh or ground water by the advance of salt water due to its greater density, usually in coastal and estuarine areas

seawall

a structure, often concrete or stone, built along a portion of a coast to prevent erosion and other damage by wave action; often it retains earth against its shoreward face; a seawall is typically more massive than (and therefore capable of resisting greater wave forces than) a *bulkhead*

sediment(s)

solid materials or fragments that originate from the break up of rock and are transported by air, water or ice, or that accumulate by other natural agents such as chemical precipitation or biological secretions; solid materials that have settled from being suspended, as in moving water or air

sediment supply

the abundance or lack of *sediment* in a coastal system that is available to contribute to the maintenance or evolution of coastal landforms including both exposed features such as *beaches* and *barrier islands*, and underwater features such as the seabed

setback

the requirement that construction be located a minimum distance inland from *tidal wetlands*, tidal water, the primary dune line, or some other definition of the *shore*

shoal

a relatively shallow place in a stream, lake, sea, or other body of water; a submerged ridge, bank, or bar consisting of or covered by sand

shore

the narrow strip of land immediately bordering any body of water, especially a sea or large lake; the zone over which the ground is alternately exposed and covered by the *tides* or *waves*, or the zone between high and low water

shoreface

the narrow relatively steep surface that extends seaward from the *beach*, often to a depth of 30 to 60 feet, at which point the slope flattens and merges with the *continental shelf*

shoreline

the intersection of a specified plane of water with the *shore* or *beach*; on National Ocean Service nautical charts and surveys, the line representing the shoreline approximates the mean high water line

shoreline armoring

a method of *shore protection* that prevents shore *erosion* through the use of hardened structures such as *seawalls*, *bulkheads*, and *revetments*; see also *armoring*

shore protection

a range of activities that focus on protecting land from *inundation*, *erosion*, or storm-induced *flooding* through the construction of various structures such as *jetties*, *groins*, or *seawalls*, or the addition of *sediments* to the *shore* (for example, *beach nourishment*)

significant wave height

the average height of the highest one-third of *waves* in a given area

soft shore protection

a method of *shore protection* that prevents *shore erosion* through the use of materials similar to those already found in a given location, such as adding sand to an eroding *beach* or planting vegetation whose roots will retain soils along the shore

spit

a fingerlike extension of the *beach* that was formed by longshore *sediment* transport; typically, it is a curved or hook-like sandbar extending into an *inlet*

spring high water

the average height of the high waters during the semi-monthly times of spring *tides* (occurs at the full and new moons)

storm surge

an abnormal rise in sea level accompanying a hurricane or other intense storm, whose height is the difference between the observed level of the sea surface and the level that would have occurred in the absence of the cyclone

subsidence

the downward settling of the Earth's crust relative to its surroundings

submergence

a rise of the water level relative to the land, so that areas that were formerly dry land become inundated; it is the result either of the sinking of the land or a net rise in sea level

surf zone

the zone of the nearshore region extending from the point offshore where waves break to the landward limit of wave run-up, as on a beach

taxa (plural of taxon)

a general term applied to any taxonomic element, population, or group irrespective of its classification level

threshold

in climate change studies, a threshold generally refers to the point at which the climate system begins to change in a marked way because of increased forcing; crossing a climate threshold triggers a transition to a new state of the system at a generally faster rate

tidal currents

the horizontal movement of ocean water caused by gravitational interactions between the Sun, Moon and Earth; part of the same general movement of the sea that is manifested in the vertical rise and fall called the *tide*; see also *ebb current* and *flood current*

tidal datum

a baseline elevation used as a vertical point of reference from which heights or depths can be reckoned; called a tidal *datum* when defined in terms of a certain phase of the *tide*

tidal freshwater marsh

a *marsh* along a river or *estuary*, close enough to the *coastline* to experience significant *tides* by nonsaline water; the vegetation is often similar to a nontidal freshwater *marsh*

tidal inlet

an opening in the *shoreline* through which water penetrates the land, thereby providing a connection between the ocean and bays, lagoons, and *marsh* and tidal creek systems; the main channel of a tidal inlet is maintained by *tidal currents*

tidal range

the vertical difference between normal high and low tides often computed as the elevation difference between mean high water and mean low water; spring tide range is the elevation difference between spring high water and spring low water

tidal wetlands

those *wetlands* that are exposed to the periodic rise and fall of the astronomical tides (see *tides* and *tides, astronomical*)

tide-dominated

a barrier or coastal area where the morphology is primarily a product of tidal processes

tide gauge

the geographic location where tidal observations are conducted; consisting of a water level sensor, data collection and transmission equipment, and local benchmarks that are routinely surveyed into the sensors

tidelands

those lands that are flooded during times of high water, and are hence available to the public under the *Public Trust Doctrine*

tide(s)

the alternating rise and fall of the surface of the ocean and connected waters, such as estuaries and gulfs, that results from the gravitational forces of the Moon and Sun; also called astronomical tides (see *tides, astronomical*)

tides, astronomical

the alternating rise and fall of the ocean surface and connected waters, such as estuaries and gulfs, that result from the gravitational forces of the Moon and Sun

tipping point

a critical point in the evolution of a system that leads to new and potentially irreversible effects at a rate that can either be much faster or much slower than forcing

transgression

the spread or extension of the sea over land areas, and the consequent evidence of such advance; also, any change such as a rise in sea level that brings offshore deep-water environments to areas formerly occupied by *nearshore*, shallow-water environments or that shifts the boundary between marine and nonmarine deposition away from deep water regions

updrift

refers to the location of one section or feature along the *coast* in relation to another; often used to refer to the direction of net longshore sediment transport between two or more locations (*i.e.*, upstream)

V Zone

areas where wave action and/or high velocity water can cause damage in the *100-year flood*; see also *A Zone*

wave-dominated

a barrier or coastal area where the *geomorphology* is primarily a product of *wave* processes

wave run-up

the upper levels reached by a *wave* on a *beach* or coastal structure, relative to still-water level

waves

regular or irregular disturbances in or on the surface of a water body that form characteristic shapes and movement patterns and a range of sizes; for the purposes of this report, waves are usually generated by the wind (see *fetch*) and occur along the *coast* or in an *estuary*

wetlands

those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils; wetlands generally include swamps, *marshes*, bogs, and similar areas

wetland accretion

a process by which the surface of *wetlands* increases in elevation; see also *accretion*

wetland migration

a process by which tidal *wetlands* adjust to rising sea level by advancing inland into areas previously above the ebb and flow of the tides

ACRONYMS AND ABBREVIATIONS

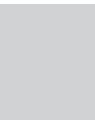
A–P	Albemarle–Pamlico	IPCC CZMS	Intergovernmental Panel on Climate Change Coastal Zone Management Subgroup
ABFE	Advisory Base Flood Elevations	LDA	limited development area
AEC	Areas of Environmental Concern	LMSL	local mean sea level
ASFPM	Association of State Floodplain Managers	MHHW	Mean Higher High Water
BFE	base flood elevation	MHW	Mean High Water
CAFRA	Coastal Facility Review Act	MLW	Mean Low Water
CAMA	Coastal Area Management Act	MLLW	Mean Lower Low Water
CBRA	Coastal Barrier Resources Act	MSL	mean sea level
CCMP	Comprehensive Coastal Management Plan	NAI	No Adverse Impact
CCSP	Climate Change Science Program	NAS	National Academy of Sciences
CORS	continuously operating reference stations	NAVD	North American Vertical Datum
CRC	Coastal Resources Commission	NCDC	National Climatic Data Center
CTP	Cooperative Technical Partnership	NERRS	National Estuarine Research Reserve System
CVI	Coastal Vulnerability Index	NDEP	National Digital Elevation Program
CZM	Coastal Zone Management	NED	National Elevation Dataset
CZMA	Coastal Zone Management Act	NFIP	National Flood Insurance Program
DDFW	Delaware Division of Fish and Wildlife	NGVD	National Geodetic Vertical Datum
DEC	Department of Environmental Conservation	NHP	National Heritage Program
DEM	Digital elevation Model	NHS	National Highway System
DFIRM	digital flood insurance rate maps	NLCD	National Land Cover Data
FEMA	Federal Emergency Management Agency	NMAS	National Map Accuracy Standards
FGDC	Federal Geographic Data Committee	NOAA	National Oceanic and Atmospheric Administration
FIRM	Flood Insurance Rate Maps	NPS	National Park Service
FIS	Flood Insurance Studies	NRC	National Research Council
GAO	General Accounting Office (1982)	NSSDA	National Standard for Spatial Data Accuracy
GAO	General Accountability Office (2007)	NTDE	National Tidal Datum Epoch
GEOSS	Global Earth Observation System of Systems	NWR	National Wildlife Refuge
GIS	geographic information system	NWS	National Weather Service
GCN	greatest conservation need	PORTS	Physical Oceanographic Real-Time System
GPS	Global Positioning System	RCA	resource conservation area
HOWL	highest observed water levels	RMSE	root mean square error
IDA	intensely developed area	RPA	resource protection area
IOOS	Integrated Ocean Observing System	SAV	submerged aquatic vegetation
IPCC	Intergovernmental Panel on Climate Change	SFHA	Special Flood Hazard Area
		SRTM	Shuttle Radar Topography Mission
		SWFL	still water flood level
		TNC	The Nature Conservancy

USACE	United States Army Corps of Engineers
U.S. EPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
US DOT	United States Department of Transportation
USGS	United States Geological Survey
VA PBB	Virginia Public Beach Board
WRCRA	Waterfront Revitalization and Coastal Resources Act

Scientific Names—Chapter Five Species

Common Name	Latin Name
American black duck	<i>Anas rubripes</i>
American oystercatcher	<i>Haematopus palliatus</i>
Atlantic menhaden	<i>Brevoortia tyrannus</i>
Atlantic silverside	<i>Menidia</i> spp.
bald eagle	<i>Haliaeetus leucocephalus</i>
bay anchovy	<i>Anchoa mitchilli</i>
belted kingfisher	<i>Ceryle alcyon</i>
black rail	<i>Laterallus jamaicensis</i>
black skimmer	<i>Rynchops niger</i>
bladderwort	<i>Utricularia</i> spp.
blue crab	<i>Callinectes sapidus</i>
bluefish	<i>Pomatomus saltatrix</i>
brant	<i>Branta bernicla</i>
canvasback duck	<i>Aythya valisineria</i>
carp	Family Cyprinidae
catfish	Order Siluriformes
clapper rail	<i>Rallus longirostris</i>
common tern	<i>Sterna hirundo</i>
crappie	<i>Pomoxis</i> spp.
diamondback terrapin	<i>Malaclemys terrapin</i>
eastern mud turtle	<i>Kinosternum subrubrum</i>
elfin skimmer (dragonfly)	<i>Nannothemis bella</i>
fiddler crab	<i>Uca</i> spp.
Forster's tern	<i>Sterna forsteri</i>
fourspine stickleback	<i>Apeltes quadracus</i>
grass shrimp	<i>Hippolyte pleuracanthus</i>
great blue heron	<i>Ardea herodias</i>
gull-billed tern	<i>Sterna nilotica</i>
herring	<i>Clupea harengus</i>
horseshoe crab	<i>Limulus polyphemus</i>
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>
laughing gull	<i>Larus atricilla</i>

Common Name	Latin Name
least bittern	<i>Ixobrychus exilis</i>
meadow vole	<i>Microtus pennsylvanicus</i>
minnows	Family Cyprinidae
mummichog	<i>Fundulus herteroclitus</i>
naked goby	<i>Gobiosoma boscii</i>
northern pipefish	<i>Syngnathus fuscus</i>
piping plover	<i>Charadrius melodus</i>
red drum	<i>Sciaenops ocellatus</i>
red knot	<i>Calidris canutus</i>
red-winged blackbird	<i>Agelaius phoeniceus</i>
ribbed mussel	<i>Geukensia demissa</i>
sand digger	<i>Neohaustorius schmitzi</i>
sand flea	<i>Talorchestia</i> spp.
sandpiper	Family Scolopacidae
sea lettuce	<i>Ulva lactuca</i>
sea trout	<i>Salvelinus fontinalis</i>
shad	<i>Alosa sapidissima</i>
sheepshead minnow	<i>Cyprinodon variegatus</i>
shiners	Family Cyprinidae
spot	<i>Leiostomus xanthurus</i>
striped anchovy	<i>Anchoa hepsetus</i>
striped bass	<i>Morone saxatilis</i>
striped killifish	<i>Fundulus majalis</i>
sundew	<i>Drosera</i> spp.
sunfish	Family Centrarchidae
threespine stickleback	<i>Gasterosteus aculeatus</i>
tiger beetle	<i>Cicindela</i> spp.
weakfish	<i>Cynoscion regalis</i>
white croaker	<i>Genyonemus lineatus</i>
white perch	<i>Morone americana</i>
widgeon grass	<i>Ruppia maritima</i>
willet	<i>Catoptrophorus semipalmatus</i>



* Indicates non-peer reviewed scientific literature.

CHAPTER I REFERENCES

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