

Bull Shark (*Carcharinus leucas*)



1

- Can grow up to 11.5 feet long
- Apex (top) predators of the North Carolina sounds
- Live in fresh and saltwater
- Feed on fish, rays, turtles, dolphins, sea birds and other sharks
- Have short, blunt noses and wide bodies

Sources:

http://www.chesapeakebay.net/fieldguide/critter/bull_shark

<https://ncseagrant.ncsu.edu/coastwatch/previous-issues/2014-2/spring-2014/sharks-of-north-carolina/>

Osprey (*Pandion haliaetus*)



2

- Have a body similar to a hawk with a wingspan of up to 6 feet
- Live near water because their diet is primarily made up of fish
- Can grab fish out of the water with their talons
- Found on every continent except Antarctica

Sources:

<http://www.audubon.org/field-guide/bird/osprey>

<http://www.chesapeakebay.net/fieldguide/critter/osprey>

American Alligator (*Alligator mississippiensis*)



3

- Can grow between 9 and 13 feet long and weigh over 500 pounds
- Live primarily in freshwater swamps and marshes, including tidal estuaries
- Have a varied diet including turtles, snakes, crayfish, birds, mammals and frogs
- Use their thick tail to propel them through water

Source:

<http://www.ncwildlife.org/Portals/0/Learning/documents/Profiles/amalligator-v5.pdf>

Organism Flashcards to be mounted on RED construction paper:

Atlantic Sharpnose Shark (*Rhizoprionodon terraenovae*)

4



- Most common sharks in North Carolina waters
- Can grow to a length of 4 feet long
- Get their name from their long, pointed snouts
- Feed on crabs, shrimp, mollusks, worms and small bony fish
- Found in both estuarine and oceanic waters

Sources:

<https://ncseagrant.ncsu.edu/coastwatch/previous-issues/2014-2/spring-2014/sharks-of-north-carolina/>
<https://www.flmnh.ufl.edu/fish/discover/species-profiles/rhizoprionodon-terraenovae>

Great Egret (*Ardea alba*)

5



- Closely related to herons
- Grow to 39 inches tall with wingspans up to 55 inches long
- Feed on fish, amphibians, small mammals and invertebrates
- Hunt by wading into water and spearing prey with their sharp beak
- Males build a nest platform before finding a female mate

Source:

http://www.chesapeakebay.net/fieldguide/critter/great_egret

Coyote (*Canis latrans*)

6



- Native only in North America and have the widest range of any wild canine species in the U.S.
- Can weigh between 20 and 45 pounds
- Have pointed ears and long, narrow snouts
- Feed on small mammals, birds, snakes, fruits, vegetables and berries

Sources:

<http://www.ncwildlife.org/Learning/Species/Mammals/Coyote2>
<http://www.nhptv.org/natureworks/coyote.htm>

Atlantic Stingray (*Dasyatis sabina*)



http://www.elasmodiver.com/atlantic_stingray.htm

1

- Live in shallow water during the summer and migrate to deep water during the winter
- Able to live in fresh or saltwater environments
- Have long, pointy snouts and a venomous barb in their tail
- Feed on worms, clams, shrimp, crabs and small fish
- Consumed by sharks and alligators
- One of the smallest stingray species

Sources:

http://www.elasmodiver.com/atlantic_stingray.htm

<http://nersp.nerdc.ufl.edu/~pmpie/dsabina.html>

Red Drum (*Sciaenops ocellatus*)



http://www.chesapeakebay.net/fieldguide/critter/red_drum

2

- Also known as channel bass and redfish
- Reddish in color and have at least one black spots on their tails
- Make a croaking or drumming sound when distressed
- Feed on crabs, shrimp and other fish
- Consumed by other fish and coastal birds
- Largest red drum ever caught (94.2 pounds) was caught off of Hatteras Island in 1984

Source:

http://www.chesapeakebay.net/fieldguide/critter/red_drum

American Oystercatcher (*Haematopus palliatus*)



<http://www.charlotteobserver.com/living/home-garden/article118422968.html>

3

- Can grow up to 19 inches in length
- Feed on oysters and other mollusks, as well as fiddler crabs
- Use their long, blade-like bill to crack open mollusk shells or to dig up prey living beneath the mud or sand
- Consumed by alligators and other coastal birds
- Build multiple nests to confuse predators

Source:

http://www.chesapeakebay.net/fieldguide/critter/american_oystercatcher

Striped Bass (*Morone saxatilis*)

4



- Also known as rockfish and striper
- Live in the ocean and migrate to fresh water to spawn
- Juveniles live in estuaries for 2-4 years
- Can live up to 30 years and grow up to 5 feet in length
- Feed on almost any kind of small fish as well as invertebrates such as crabs or squid
- Consumed by birds and larger fish such as sharks

Source:
http://www.chesapeakebay.net/fieldguide/critter/striped_bass

Summer Flounder (*Paralichthys dentatus*)

5



- Both eyes are located on the top side of their heads
- Can change colors to blend in with their surroundings in order to protect themselves from predators or to sneak up on prey
- Live on the bottom and feed on shrimp, worms, crabs and other fish
- Consumed by large fish, sharks, eels and birds
- Juvenile flounder live in submerged aquatic vegetation (SAV) beds for protection from predators

Sources:
http://www.chesapeakebay.net/fieldguide/critter/summer_flounder
<https://a-z-animals.com/animals/flounder/>

Brown Pelican (*Pelecanus occidentalis*)

6



- Have a wingspan of 6 feet and can weigh up to 10 pounds
- Their elastic pouches underneath their bills can hold up to three times more than their stomachs can
- Live near shallow waters and can eat up to 4 pounds of fish per day including menhaden and herring
- Use their excellent eyesight and diving abilities to capture prey from the water
- Predators include coyotes and humans

Source:
http://www.chesapeakebay.net/fieldguide/critter/brown_pelican

Organism Flashcards to be mounted on **YELLOW** construction paper:

Steamer Clam (*Mya arenaria*)



1

- Also known as Soft Shell Clam
- Use their foot to bury themselves just below the surface of the sand or mud
- Known as filter feeders because they eat by filtering plankton from the water through their straw-like siphon
- Consumed by birds, stingrays, blue crabs and humans

Source:
http://www.chesapeakebay.net/fieldguide/critter/soft_shell_clam

Blue Crab (*Callinectes sapidus*)



2

- Named for their bright blue claws
- Have walking legs and swimming legs so they can travel both on land and in the water
- Feed on mussels, snails, fish and plants
- Shed their hard, outer shell up to 25 times during their lifetime
- Consumed by humans, birds, fish, turtles and alligators

Source:
http://www.chesapeakebay.net/fieldguide/critter/blue_crab

Eastern Oyster (*Crassostrea virginica*)



3

- Form reefs in brackish waters like that of an estuary
- Can grow to be 3 to 5 inches in length
- Have two rough shells to protect their soft bodies
- Filter feed by pumping water through their gills and trapping food particles such as plankton
- Can filter between 10 and 40 gallons of water per day
- Consumed by birds and are prone to infection by parasites

Source:
http://www.chesapeakebay.net/fieldguide/critter/eastern_oyster

Organism Flashcards to be mounted on **YELLOW** construction paper:

Spot (*Leiostomus xanthurus*)



4

- Also known as Norfolk spot
- Have 12 to 15 dark, angled bars across their backs and a dark spot directly behind their gill slits
- Grow to be between 11 and 12 inches long
- Considered bottom feeders and prey on bristle worms, mollusks, shrimp and detritus
- Consumed by sharks, striped bass and bluefish

Sources:

<http://www.chesapeakebay.net/fieldguide/critter/spot>

<http://nerrs.noaa.gov/doc/siteprofile/acebasin/html/sppgal/sgfish.htm>

Mummichog (*Fundulus heteroclitus*)



5

- Also known as mud minnow and grow to be only 5 or 6 inches in length
- Travel in schools of hundreds of individuals
- Live in muddy marshes, tidal creeks and grass flats
- Feed on insects, plants, algae, worms, small crustaceans and other fish
- Consumed by larger fish and birds

Sources:

<http://www.chesapeakebay.net/fieldguide/critter/mummichog>

<http://www.dnr.sc.gov/cwcs/pdf/Mummichog.pdf>

Atlantic Menhaden (*Brevoortia tyrannus*)



6

- Have dark spots on their sides and a yellowish tint on their sides
- Filter feed by swimming with their mouths open and filtering plankton out of the water
- Consumed by most larger fish, birds and mammals
- Eggs hatch in the open ocean and the larvae drift into estuaries where they develop for a year before returning to the ocean
- Swim in large schools near the surface of the water

Source:

http://www.chesapeakebay.net/fieldguide/critter/atlantic_menhaden

Copepod (zooplankton)



1

- Microscopic animals that live near the water's surface and drift with the current in both salt and freshwater ecosystems
- Copepods are permanent zooplankton, meaning they remain in planktonic form their entire life cycle (1-2 millimeters long)
- Feed on phytoplankton (plants) and detritus
- Consumed by many aquatic species such as fish, shrimp, crabs, oysters and clams
- Swim using their long antennae

Sources:

<http://nerrs.noaa.gov/doc/siteprofile/acebasin/html/biores/zooplank/zptext.htm>
<http://marinebio.org/oceans/zooplankton/>

Eastern Mudsail (*Ilyanassa obsoleta*)



2

- Have dark black or brown shells that are between 1.5-3 cm high
- Feed on algae and diatoms that they scrape off of mud or other plants
- Consumed by birds and crabs
- Use their shells as protection and camouflage from predators
- Can be found on shorelines all over the United States

Source:

http://www.exoticguide.org/ilyanassa_obsoleta

Crab Larvae (zooplankton)



3

- Microscopic animals that live near the water's surface and drift with the current
- Crab larvae are juvenile, microscopic crabs that will eventually grow out of the planktonic stage and into full-sized crabs
- Feed on phytoplankton (plants) and detritus
- Consumed by many aquatic species such as fish, shrimp, crabs, oysters and clams

Source:

<http://nerrs.noaa.gov/doc/siteprofile/acebasin/html/biores/zooplank/zptext.htm>

Organism Flashcards to be mounted on BLUE construction paper:

Bristle Worm (*Nereis succinea*)



4

- Have soft bodies with hair-like bristles on each side
- Some build tube-shaped burrows in the mud to live in while others migrate through shallow waters
- Feed on plankton, algae and detritus
- Consumed by many fish and crustacean species
- Use their bristles to pick up chemical smells in the water

Source:
http://www.chesapeakebay.net/fieldguide/critter/bristle_worms

Brown Shrimp (*Farfantepenaeus aztecus*)



5

- North Carolina's most abundant shrimp species
- Born in the open ocean and carried into estuaries by the tides and currents
- Prefer to live in submerged aquatic vegetation (SAV) beds
- Called omnivores because they eat both plants and animals including copepods, mollusks, diatoms, algae and detritus
- Consumed by fish, birds, jellyfish, crabs and humans

Sources:
<http://portal.ncdenr.org/web/mf/nc-shrimphttps://a-z-animals.com/animals/flounder/>
<http://gulffishinfo.org/Species?SpeciesID=106>

Fish Larvae (zooplankton)



6

- Microscopic animals that live near the water's surface and drift with the current
- Most fish species start out in a microscopic stage but will eventually grow out of the larval stages into their adult stages
- Feed on phytoplankton (plants) and detritus
- Consumed by many aquatic species such as fish, shrimp, crabs, oysters and clams

Source:
<http://nerrs.noaa.gov/doc/siteprofile/acebasin/html/biores/zooplank/zptext.htm>

Diatoms (phytoplankton)



1

- Phytoplankton are called “plants of the sea”
- Because they are plants, they undergo photosynthesis to produce oxygen for the ecosystem
- Diatoms are an abundant source of food for many zooplankton
- They are single-celled organisms that live in a shell made of glass
- The first diatom appeared around 100 million years ago

Sources:

<http://www.planktonchronicles.org/en/episode/diatoms-life-in-glass-houses>
<http://vanderbilt.edu/AnS/Chemistry/groups/wright/Diatoms.html>

Algae (phytoplankton)



2

- Aquatic, plant-like organism
- Convert sunlight into energy and add oxygen to the estuary through the process of photosynthesis
- There are 3 types of algae: red, green and brown
- Can range from single-celled organisms to large seaweeds
- Food source for zooplankton, worms, shrimp, snails and fish

Sources:

<http://www.fondriest.com/environmental-measurements/parameters/water-quality/algae-phytoplankton-chlorophyll/#algae1>

Algae (phytoplankton)



4

- Aquatic, plant-like organism
- Convert sunlight into energy and add oxygen to the estuary through the process of photosynthesis
- There are 3 types of algae: red, green and brown
- Can range from single-celled organisms to large seaweeds
- Food source for zooplankton, worms, shrimp, snails and fish

Sources:

<http://www.fondriest.com/environmental-measurements/parameters/water-quality/algae-phytoplankton-chlorophyll/#algae1>

<p>Detritus (decomposer)</p>  <p>http://ddnwr.weebly.com/ecosystems.html</p>	<p>3</p> <ul style="list-style-type: none">• Mixture of decaying plants and animals, also called organic material• Microscopic bacteria, algae and fungi live in detritus and help it to decompose• Detritus is a great fertilizer for plants and a food source for worms, fish, crabs and shrimp <p>Sources: http://marinebio.org/oceans/estuaries-salt-marshes-mangroves/ http://ccrm.vims.edu/publications/wetlands_technical_reports/96-10-detritus.pdf</p>
<p>Detritus (decomposer)</p>  <p>http://web.vims.edu/bio/shallowwater/ecosystem_processes/detritus_information.html</p>	<p>5</p> <ul style="list-style-type: none">• Mixture of decaying plants and animals, also called organic material• Microscopic bacteria, algae and fungi live in detritus and help it to decompose• Detritus is a great fertilizer for plants and a food source for worms, fish, crabs and shrimp <p>Sources: http://marinebio.org/oceans/estuaries-salt-marshes-mangroves/ http://ccrm.vims.edu/publications/wetlands_technical_reports/96-10-detritus.pdf</p>
<p>Detritus (decomposer)</p>  <p>https://tannaquatics.com/blogs/news?page=2</p>	<p>6</p> <ul style="list-style-type: none">• Mixture of decaying plants and animals, also called organic material• Microscopic bacteria, algae and fungi live in detritus and help it to decompose• Detritus is a great fertilizer for plants and a food source for worms, fish, crabs and shrimp <p>Sources: http://marinebio.org/oceans/estuaries-salt-marshes-mangroves/ http://ccrm.vims.edu/publications/wetlands_technical_reports/96-10-detritus.pdf</p>

Pollution Flashcards:

<p style="text-align: center;">Bacteria 1</p> <p>Shellfish, such as oysters, clams, and mussels, are filter feeders but they can also consume bacteria and viruses that are present in the water. High levels of certain bacteria can indicate contamination by human or animal waste, which means that any organism that consumes these filter feeders is at risk of infection.</p>	<p style="text-align: center;">Low Dissolved Oxygen 2</p> <p>Dissolved oxygen is the amount of tiny oxygen bubbles in the water column. Very low dissolved oxygen levels can be caused by algal blooms which occur when excess nutrients in the water lead to an overgrowth of algae. Low dissolved oxygen levels can be very dangerous for fish and shellfish species.</p>	<p style="text-align: center;">Suspended Sediment 3</p> <p>Soil and organic material that is moved from the land to the water is called suspended sediment. Runoff from agricultural lands and construction sites has increased suspended sediment loads in waterways. This sediment can affect estuaries by decreasing visibility for organisms and blocking sunlight to underwater plants. Large amounts of suspended sediment make the water murky and when the sediment settles to the bottom, it covers up organisms that live on the bottom such as oysters and underwater grasses.</p>
<p style="text-align: center;">Nutrients 4</p> <p>Nutrients are important for plant life and are used in agriculture to improve crop growth. However, when washed into rivers and estuaries, nutrients can lead to excess phytoplankton or algae growth called a bloom. These blooms can block sunlight from reaching submerged aquatic vegetation (SAV) and can consume all oxygen from the water causing fish kills. Some blooms even produce toxins which can be harmful to human health.</p>	<p style="text-align: center;">Herbicides 5</p> <p>Herbicides are used on lawns and agricultural fields to kill unwanted plants like weeds. However, when these herbicides are washed into rivers and estuaries, they can cause damage. For example, herbicides can kill submerged aquatic vegetation (SAV) beds which are used by many organisms for protection from predators. When they are no longer able to hide in grass beds from predators, organisms such as fish and shrimp are much more likely to be eaten.</p>	<p style="text-align: center;">Runoff 6</p> <p>Fluids from cars like oil or grease and metals such as mercury or lead have all been found to pollute estuaries. These substances can enter an estuary through industrial discharges, yard runoff, streets, agricultural lands, and storm drains.¹ When these toxins sink into the sediment and are consumed by plants and animals, they can pass along these dangerous toxins to other organisms in the food chain.</p>

¹ http://oceanservice.noaa.gov/education/kits/estuaries/media/supp_estuar09a_toxic.html