Understanding Water and its Role in our Lives and our Environment

Water Conservation and Protection in the Barnegat Bay Watershed

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POP QUIZ!!!

WATER FACTS!!!

What’s Do You Know about Water?

WATER IQ
Know your water.

http://hpwd.org/images/waterIQlogo.jpg
How much of the earth's water is ocean?

- A) 50%
- B) 30%
- C) 75%
- D) 95%
What atoms make up a water molecule?

- A) ABC
- B) CO₂
- C) Ca
- D) H₂O
Which country has the highest average daily water use per person

- A) Canada
- B) Australia
- C) United States
- D) Japan
- E) China

- 1,268 gallons
- 945 gallons
- 1,565 gallons
- 668 gallons
- 334 gallons
The human body is made up of ______% water.

- A) 100%
- B) 1%
- C) 66%
- D) 30%
The Water Cycle

- **Condensation**
- **Evaporation**
- **Run-off**
- **Infiltration**
- **Fresh Water Storage**
- **Ground Water enters ocean**

**Precipitation**

Image source: U.S. Geological Survey (USGS)
A World of Salt
Total Global Saltwater and Freshwater Estimates

Saltwater
97.5%
1 365 000 000 km³

Freshwater
2.5%
35 000 000 km³

- 0.3% Lakes and river storage
- 30.8% Groundwater, including soil moisture, swamp water and permafrost
- 68.9% Glaciers and permanent snow cover

Groundwater

- Ocean Water 97.3%
- Fresh Water 2.7%
- Groundwater 0.575%
- Rivers 0.001%
- Atmosphere 0.0001%
- Lakes 0.017%
- Ice 2.065%
Aquifer

- Water-bearing rock readily transmits water to wells and springs

- Precipitation eventually adds water into the porous rock of the aquifer.
Aquifers and wells

- Artesian well
- Flowing artesian well
- Unconfined aquifer
- Confined aquifer
- Top of the confined aquifer
- Water table well (in unconfined aquifer)
- Confining layer (impermeable)

Source: Environment Canada
Focus on the Barnegat Bay

Water in your Home Ecosystem
Barnegat Bay Watershed

- Lands vary from coastal dune, marshes, interior pine barrens
- Covers 660 square miles of water, pinelands, towns, and open space!
Beachwood Elementary

Huddy Park

Toms River

Clamming Creek

Metedeconk River

Island Beach State Park

Point Pleasant Boardwalk

Seaside Heights Boardwalk

William Dudley Park
Barnegat Bay Estuary

http://pubs.usgs.gov/circ/2003/circ1262/#figurecaption44234224
Animals In Barnegat Bay Estuary

- Thousands of species of plants and animals live in the Barnegat Bay, including:
  - Fish like flounder and seahorse
  - Reptiles like mud turtles and terapins
  - Molluscs like scallops and clams
  - Crustaceans like crabs and shrimp
  - Birds like herons, ospreys and egrets
What is a food chain?

- A food chain is “a sequence of organisms, each of which uses the next, lower member of the sequence as a food source”
What is a producer?

- An organism that creates its own food, usually through photosynthesis
- What can you think of that might be the most common source of energy for all producers?
- The SUN
**Important facts about food chains**

- In a food chain, each organism obtains energy from the one at the level below.

- Plants are called **producers** because they create their own food through photosynthesis.

- Animals are **consumers** because they cannot create their own food, they must eat (consume) plants or other animals to get the energy they need.
Primary Producers

- Primary producers are “organisms capable of producing their own food”
- We can also say that they are photosynthetic, use light energy.
- Examples of primary producers include algae, phytoplankton, and large plants.
- Primary producers are eaten by primary consumers (herbivores).
Primary Producers of Barnegat Bay

Eelgrass

Diatoms

Dinoflagellates

Microflagellates

http://weblog.signonsandiego.com/weblogs/afb/archives/eelgrass.jpg

http://photography.nationalgeographic.com/staticfiles/NGS/Shared/StaticFiles/Photography/Images/Content/diatom-shapes-52753-sw.jpg

http://www.vattenkikaren.gu.se/fakta/arter/algae/mikroalg/ceraspp/cerasp.jpeg

Four types of consumer

- **Herbivores:** animals that eat only plants
- **Carnivores:** animals that eat only other animals
- **Omnivores:** animals that eat animals and plants
- **Detritivores:** Animals that eat dead materials and organic wastes (aka decomposers)
**HERBIVORES**

These are animals that eat mainly **plants**. This includes leaves, grass, flowers, seeds, roots, fruits, bark, pollen and much more.

Some herbivores are:
- deer
- horses
- rabbits
- cows
- bees
- sheep
- grasshoppers

http://www.sheppardsoftware.com/content/animals/kidscorner/animaldiet/herbivore.htm
**Carnivores**

These are animals that eat mainly meat:
This includes insects and all animals.

Some carnivores are:

- **Felines** (lions, tigers & all cats)
- **Birds of prey** (eagles, hawks, owls etc.)
- **Sharks**
- **Frogs**
- **Spiders**

http://www.sheppardsoftware.com/content/animals/kidscorner/animaldiet/carnivore.htm
Omnivores

These are animals able to eat plants AND animals.

Some omnivores are:
- humans
- most bears
- raccoons
- most primates (apes & monkeys)
- seagulls & other birds

http://www.sheppardsoftware.com/content/animals/kidscorner/animaldiet/omnivore.htm
DECOMPOSERS

They consume (eat) dead plants & animals and decomposes them - reduces them to simpler forms of matter.

PRIMARY DECOMPOSERS

Fungi & Bacteria

http://www.sheppardsoftware.com/content/animals/kidscorner/foodchain/decomposers.htm
Other Ways to Classify Consumers

1. **Primary Consumers:** Herbivores

2. **Secondary Consumers:** Carnivores that eat herbivores

3. **Tertiary Consumers:** Carnivores that eat other carnivores
Primary Consumers in Barnegat Bay

Grass Cerith (a type of snail; eats mostly Eelgrass)
Primary Consumers in Barnegat Bay

- Eelgrass Pill Bug (eats Eelgrass)

http://4.bp.blogspot.com/_ODUGIghaapl/SKP-k__HmDI/AAAAAAAAE5Y/4lfc_8nzmeA/s400/pill+bug.JPG
Secondary Consumers

- Blue Crab (eats worms, snails, etc.)

http://www.flnnh.ufl.edu/fish/gallery/descript/alligatorcar/bluecrab.jpg
Tertiary Consumers

- Eat other animals in marsh including voles, fish, and other types of birds
Omnivore

- Mallard ducks eat invertebrates, fish, amphibians, plants
Detritivore

- Worms are common detritivores in many ecosystems including Barnegat Bay
What is a food web?

A food web is “an interlocking pattern of food chains”
Barnegat Bay Estuary
Human Impact of Barnegat Bay Estuary
Why Care?

- Seaside towns such as Seaside Heights and Point Pleasant Beach affected

- Too much salt water intrusion into estuary can make certain species in estuary die along with grasses they eat.

- About 85% of the fishes and shellfishes sold in world spend all or part of lives in estuaries
Why Care?
Why Care?
Show You Care

Be Aware!