

An aerial photograph showing the Mississippi River delta as it meets the Gulf of Mexico. The river is a prominent, winding feature in the upper left, branching out into a complex network of distributaries that fan out across the delta plain. The water in the river and its branches is a light, turbid brownish-green color, contrasting with the darker, more saturated green of the surrounding land. The Gulf of Mexico is visible in the lower right, appearing as a deep blue expanse. The overall scene illustrates the process of sediment deposition and the formation of a large, fertile estuary.

Estuaries

An estuary is formed when salt water mixes with fresh water from a river. This aerial photograph is of the Mississippi River meeting the Gulf of Mexico.

Properties of estuaries



Estuaries contain an abundance of dissolved oxygen, nutrients and minerals supplied by the river water.

The salinity of estuaries changes frequently based on rain amounts and coastal storms.

Estuaries are shallow (water less than 30 ft. deep, so sunlight can reach the bottom, allowing plants to grow.



Properties of Estuaries

Many organisms thrive in these high nutrient, secluded environments...there is great diversity



Estuaries serve as nurseries for many marine organisms because of the relative safety



Importance of Estuaries

- They help control erosion (the washing away of land/beach) and reduce flooding.
 - Sandbars buffer the impact of waves, while plants and shellfish anchor the shore against tides.
- Act as an environmental filter: plants and animals here filter out pollutants from the water.



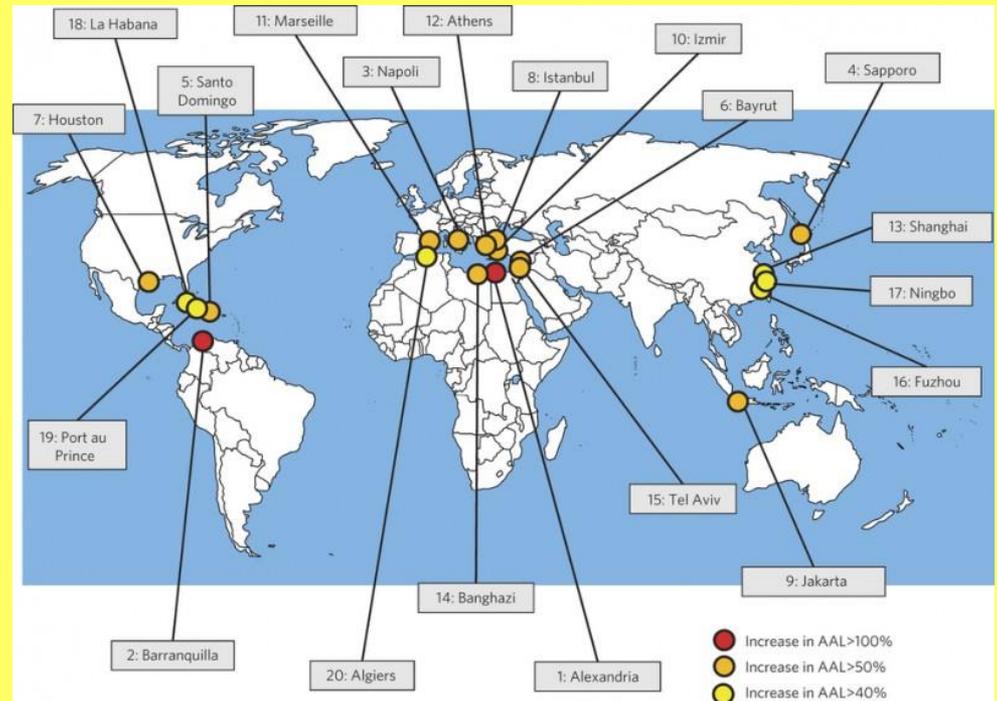
Salt marsh plants trap some of the chemicals and pathogens carried by rivers and move them into the soil where they are neutralized.



Oysters filter impurities out of water as they eat, collecting the contaminants in their bodies (Fun fact: oysters can filter 25 gallons of water a day)

How are Humans Harming Estuaries

- 50% of people live within 50 miles of the sea; big cities are often near where rivers meet the sea.



- People harm estuaries: shrimp farms, estuaries filled in for raising crops or housing, POLLUTION
 - Toxins can build up, causing environmental and health problems
- Protection from government (make laws) and local organizations and individuals (cleaning)

An aerial photograph of an estuary. A river flows from the top left towards the bottom center, where it meets the ocean. The river's path is marked by a winding, light-colored channel. The surrounding land is a mix of brown and green, indicating a mix of vegetation and possibly agricultural or developed areas. The ocean water is a deep blue, contrasting with the lighter, turbid water of the estuary. The text "Food Webs in Estuaries" is overlaid in white, sans-serif font in the upper right quadrant.

Food Webs in Estuaries

How do plants and animals of an estuary get their energy?



The sun is the ultimate source of energy for all living things.

Green plants can change sunlight energy into food (chemical) energy.



Producers make their own food using energy from sunlight. This is called photosynthesis.



algae



eelgrass



Microscopic
phytoplankton

Photosynthesis

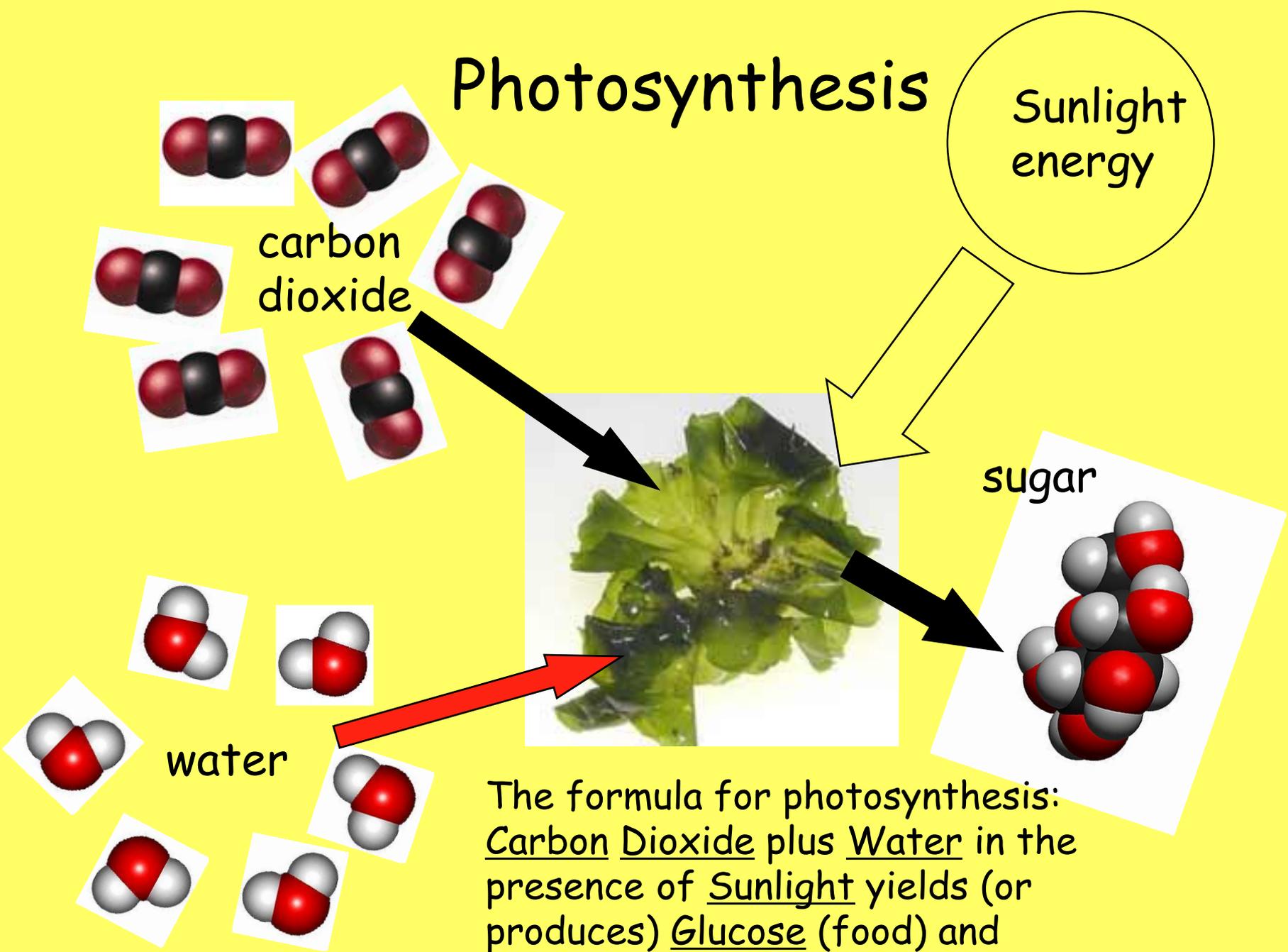
Sunlight
energy

carbon
dioxide

sugar

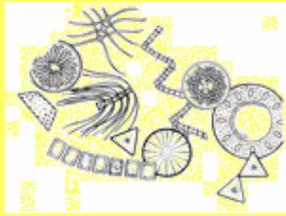
water

The formula for photosynthesis:
Carbon Dioxide plus Water in the
presence of Sunlight yields (or
produces) Glucose (food) and
Oxygen

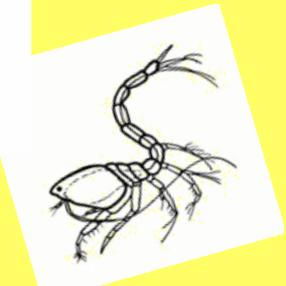
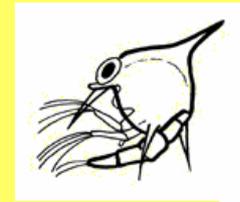
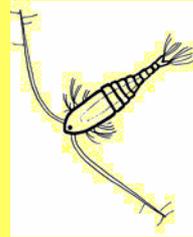


Small but Mighty

Phytoplankton are floating microscopic plants. They are very important estuary producers.



Phytoplankton



Zooplankton

Phytoplankton are eaten by floating animals, **zooplankton** - and by bigger animals like snails, clams, and barnacles.

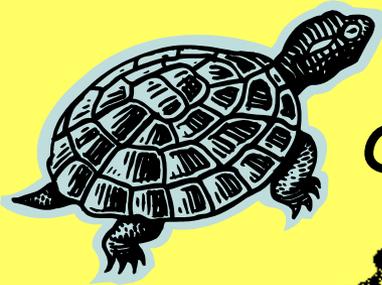
Consumers are animals that get their energy from eating plants or other animals.



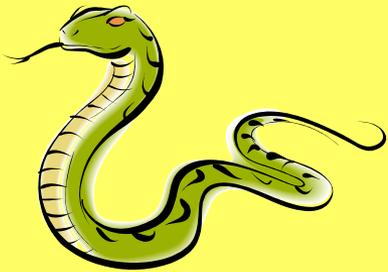
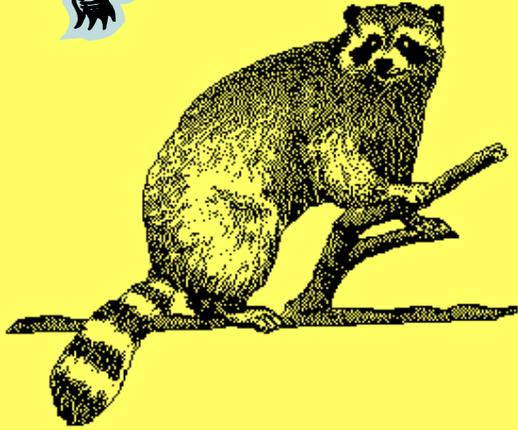
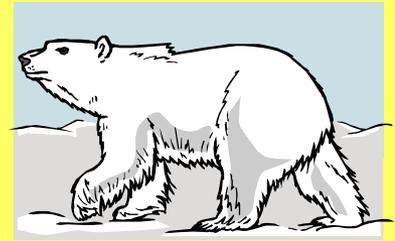
Primary consumers (herbivores) are organisms that eat plants.



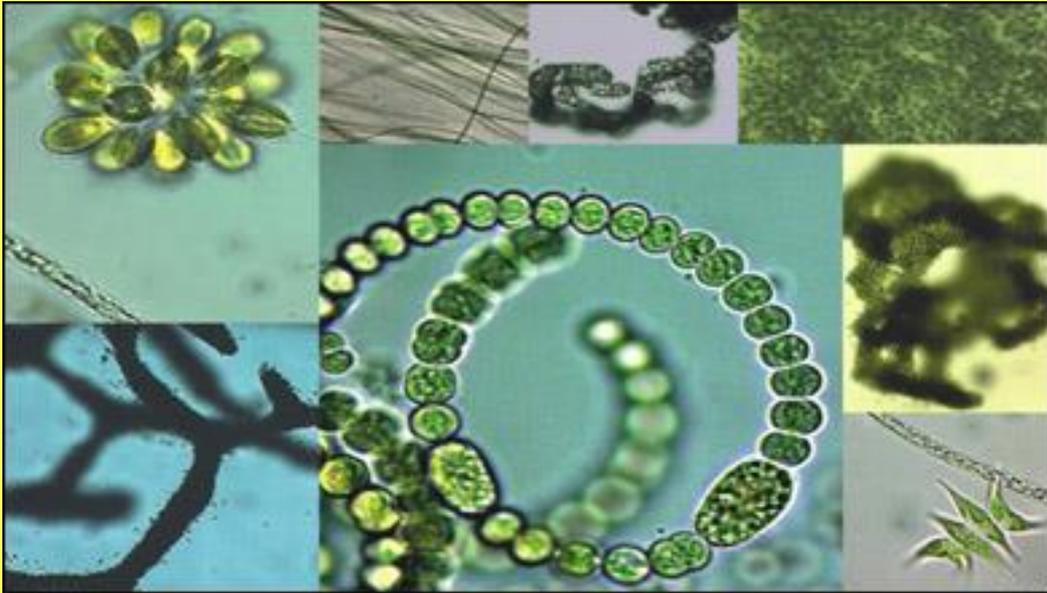
Secondary consumers (carnivores) are organisms that eat other animals.



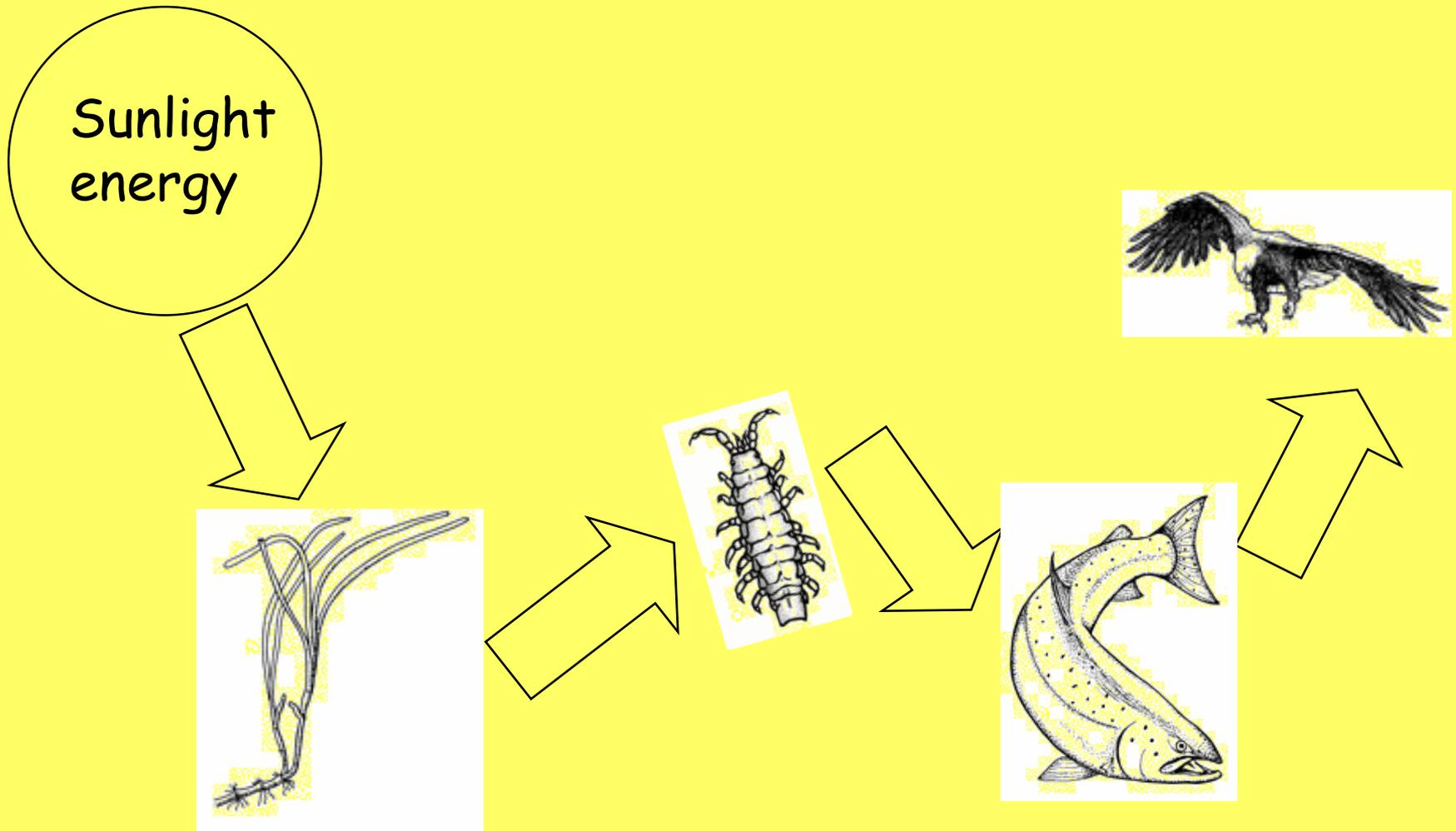
Omnivores eat both plants and animals!



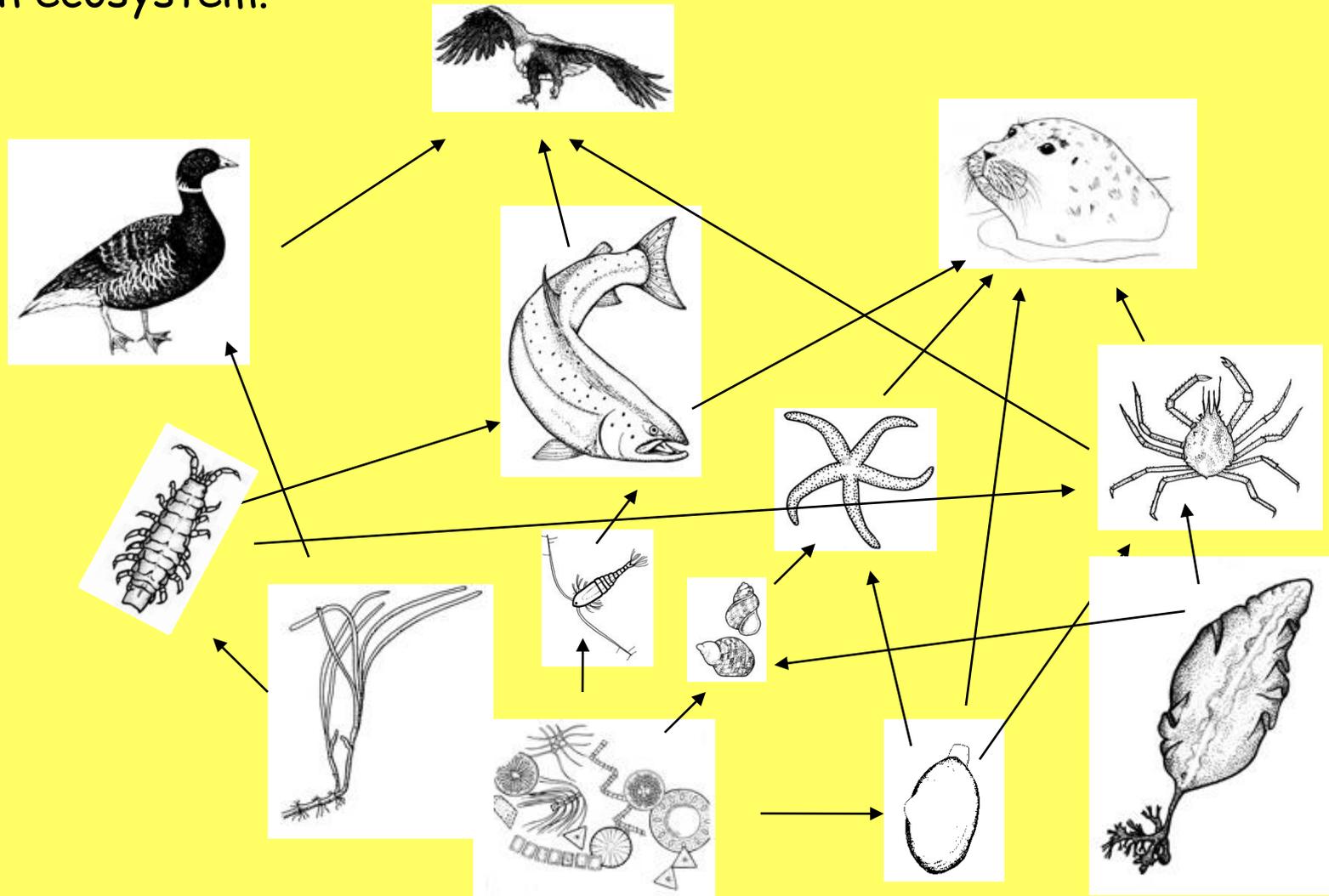
A decomposer is an organism that gets its food and energy needs by breaking down the remains of dead organisms (i.e. many types of bacteria and most fungi.)



Each type of organism (producers, consumers, and decomposers) is necessary in an ecosystem. Energy is transferred from one organism to the next through a food chain.

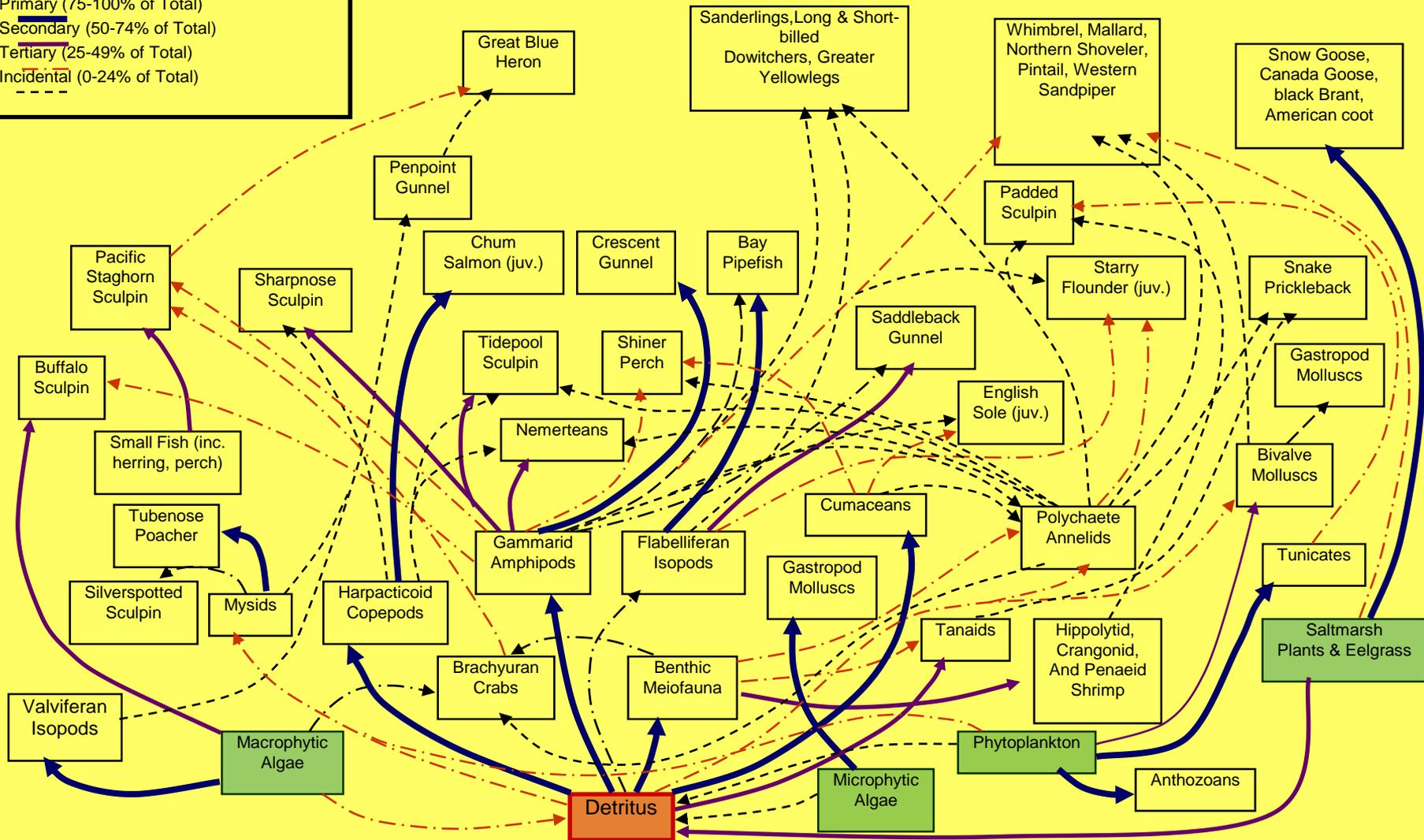


Estuary food chains often overlap, making food webs. Food webs are used to show the interconnected network of many food chains within an ecosystem.



Because many animals eat more than one thing, tracing energy through the estuary can get messy.

Relative Importance Of Food Web Linkages
 Primary (75-100% of Total)
 Secondary (50-74% of Total)
 Tertiary (25-49% of Total)
 Incidental (0-24% of Total)
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Are you part of the Estuary Food Web?

