

# WHAT ARE ECOSYSTEMS?

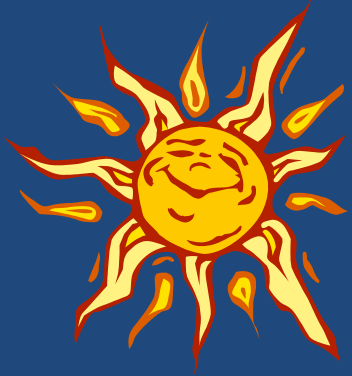


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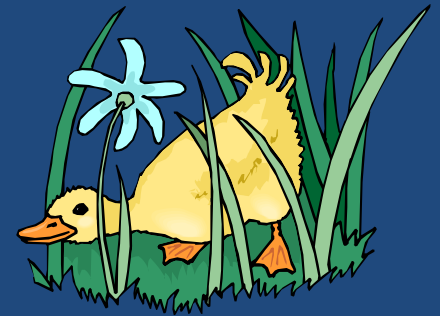
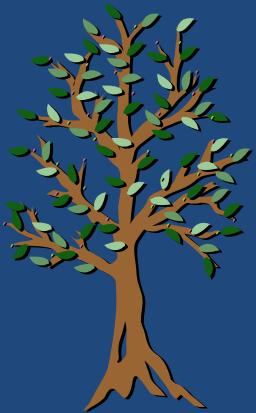


**An ECOSYSTEM is an interacting system of plant, animals, and humans and the surrounding environment. An ecosystem contains living and non-living things that contribute to the functioning of other organisms. An ecosystem is NOT just a collection of organisms. It is a system of interactions and interrelationships.**

# ENVIRONMENT



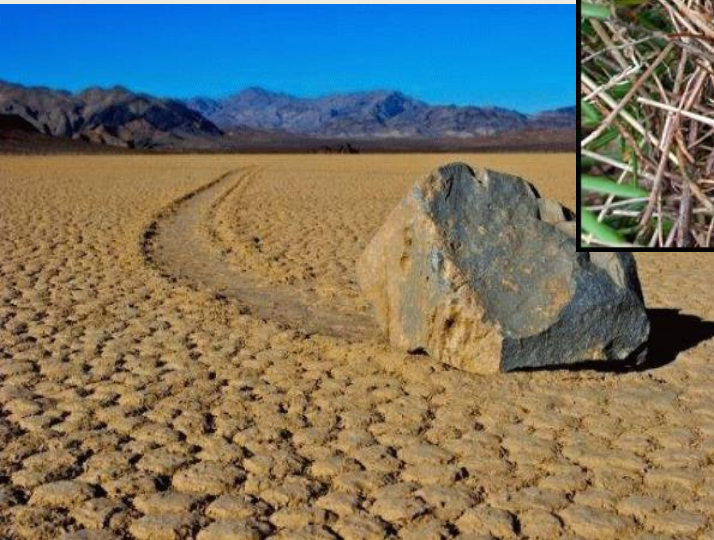
The living and nonliving things that surround a living thing make up its **environment.**





# Parts of an Ecosystem

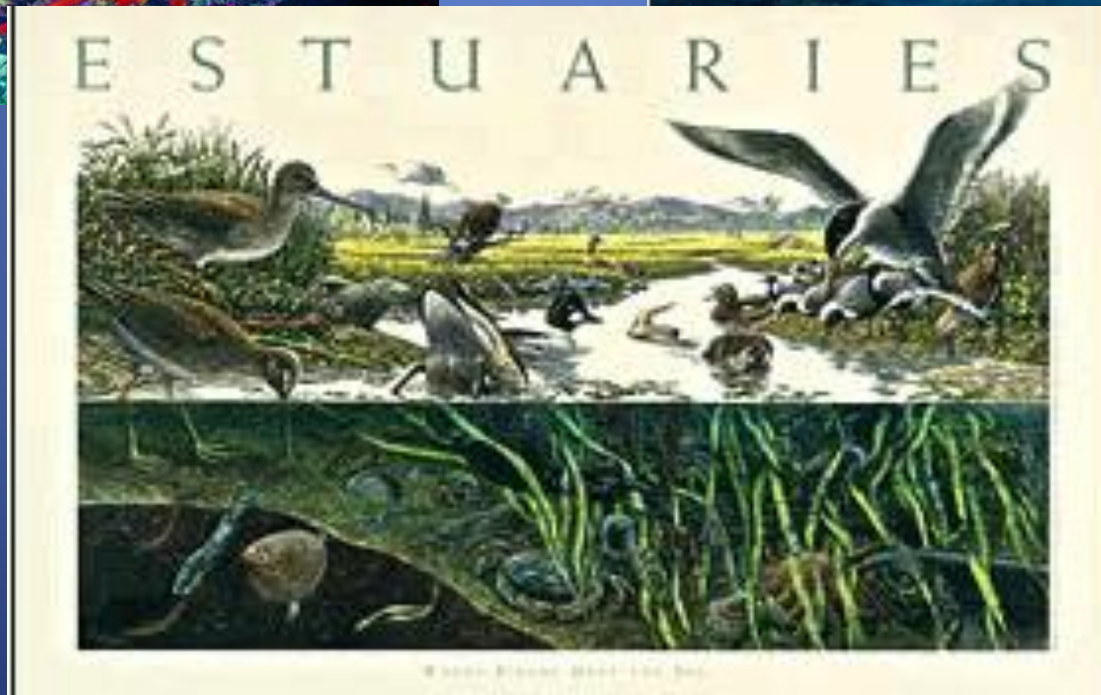
- An *ecosystem* is made up of all the living and nonliving things in an *environment*.



**All members of a  
community live in the same  
ecosystem but they do not all  
live in the same part of the  
ecosystem.**



# Marine Ecosystems



# Saltwater Ecosystems

- Saltwater ecosystems are again in the water, but unlike freshwater ecosystems, saltwater ecosystems have very salty water.
- They also make up the vast majority of the Earth's ecosystems.
- They are the world's largest ecosystems.
- Some examples of saltwater ecosystems are oceans and coral reefs.





# Types of Marine Ecosystems

- Estuaries
- Salt marshes
- Rocky shores
- Sandy Shores
- Coral reef
- Mangrove swamp
- Barrier islands
- Sand dunes
- Wetlands
- Backwaters
- Mud banks





# ESTUARIES

An area in which fresh water from a river mixes with salt water from the ocean; a transition area from the land to the ocean. Other names: bay, sound, lagoon, harbor, or bayou.

The Ocean

Area where fresh  
and salt water  
mix

River bringing  
freshwater to the  
sea



# Characteristics of Estuaries

- **Water is brackish : a mixture of freshwater and saltwater**
- **There is a gradual increase in salinity as you go from the river (0-5ppt) to the middle of the estuary (5-25ppt), to the ocean (>25 ppt).**

**(ppt = parts per thousand, a unit for salinity)**

- **Pollutants are absorbed in estuaries.**

# Estuary plants

Plants must be adapted to salty habitat



cordgrass



eelgrass



glasswort – a succulent



# Estuary animals

Huge variety including...

Blue crab, Stone crab, Fiddler crab,  
Horseshoe crab, Mosquito, Lobster,  
Flounder, Stripped bass, Crane,  
Flamingo, Sea gull, Ibis, Manatee, otters,  
and many more.



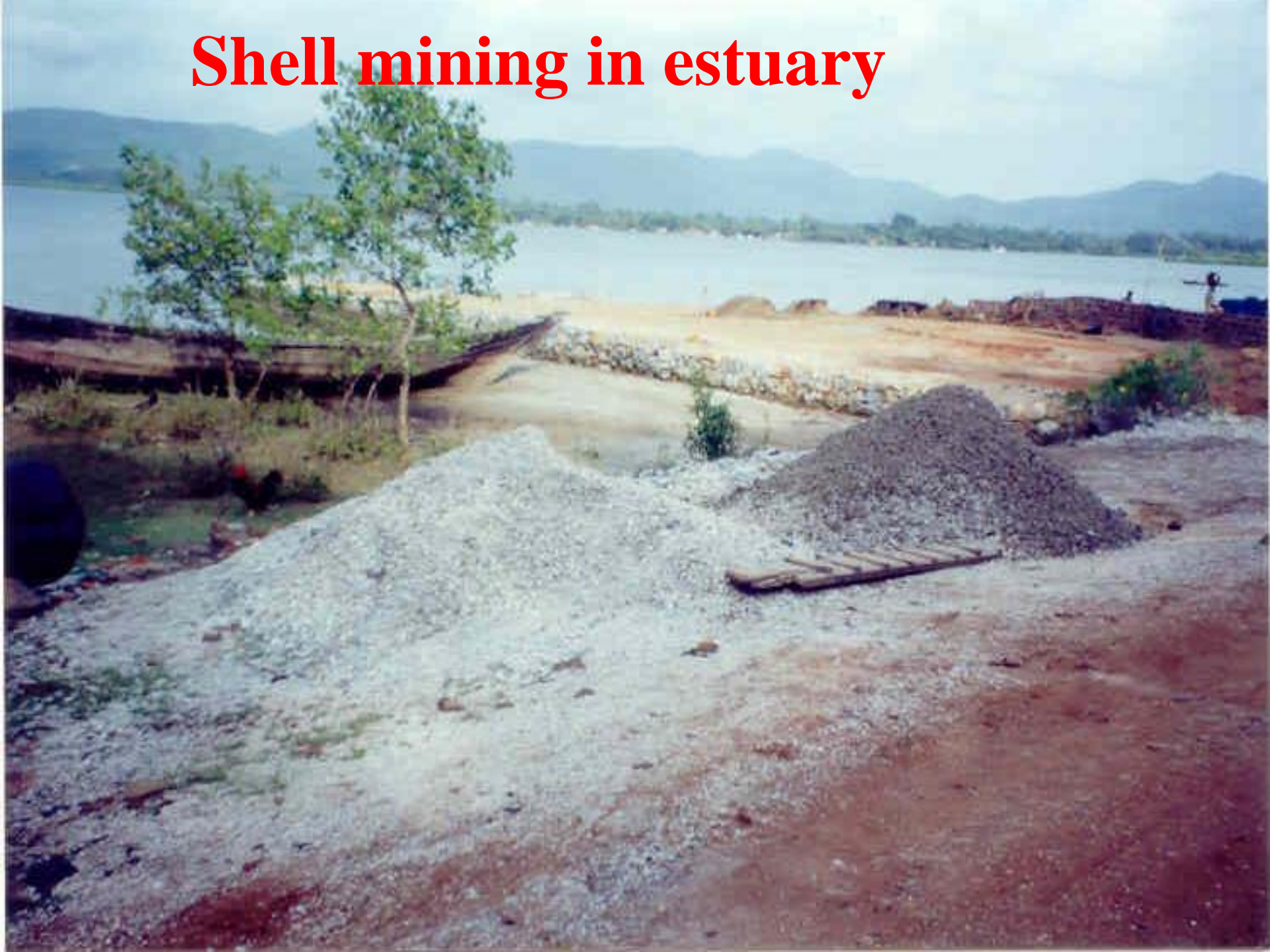
# Threats in Estuary

- Aquaculture
- Sand & Shell mining
- Encroachments
- Fire wood
- Fishery





# Shell mining in estuary





# Salt Marshes





**Salt marshes are coastal wetlands rich in marine life. They are sometimes called tidal marshes, because they occur in the zone between low and high tides. Salt marsh plants cannot grow where waves are strong, but they thrive along low-energy coasts.**







# Rocky shores

Also called rocky intertidal zone – many places to live in this habitat, means high biodiversity

Organisms must be adapted to wave action, changing tide levels



# Rocky Shores

At low tides, there are often tide pools left behind where you can see starfish, anemones, crabs, octopus











**Rock pool**

# Sandy beaches



- **Beach is a unique environment occupied by animals that have adapted to the constant motion of the sand, gravel or shell.**
- **Many important birds, reptiles, and other animals nest and breed on the berm and open beach, as well as feed and rest there**





Beaches provide a unique habitat for burrowing species such as mole crabs, coquina clams, razor clams, and others.





# Coral reefs

- One of the most productive ecosystems in the world.
- Largest living thing on Earth
- Covers less than 1% of the Earth's Surface
- Needs sunlight to grow



# Coral Reefs

There are many different kinds of corals:



Soft corals



Hard corals





# Threats to Coral Reefs



# Coral-eating Snails





# Crown of Thorns Starfish





# **MANGROVE SWAMPS**

Coastal wetlands located in tropical and subtropical zones; characterized by salt-tolerant trees and shrubs, such as mangrove trees















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# A mangrove shelter





# Mangroove destruction and deforestation









# BARRIER ISLANDS

Narrow islands made of sand that provide a buffer for the mainland from the sea

Constantly shifting, especially with storms







**Barrier islands are  
constantly changing.**





# Coastal Sand dunes

Coastal sand dune (CSD) habitats serve as an ecological niche between terrestrial and marine realms, and form important nature conservation sites.







# **SAND DUNE VEGETATION**

**DUNE PLANTATION**





**Sand dune vegetation**



# The Ramsar Convention on Wetlands

The Convention on Wetlands, signed in Ramsar, Iran, in 1971, is an intergovernmental treaty which provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. There are presently 162 Contracting Parties to the Convention, with 2,040 wetland sites, totaling 193 million hectares, designated for inclusion in the Ramsar List of Wetlands of International Importance.



# **WHAT IS THE RAMSAR CONVENTION ON WETLANDS?**

- **Oldest of the global environmental conventions**
- **the only global convention focusing attention on an ecosystem (wetlands)**
- **covers very wide range of wetlands - from coral reefs to mountains**
- **Ramsar, Iran - where 18 countries signed the Convention on 2 February 1971**
- **Celebrated annually on World Wetlands Day - 2 February**



# Ramsar Convention: Mission Statement

**“The conservation and wise use of wetlands through local, regional and national actions and international cooperation as a contribution towards achieving sustainable development throughout the world.”**

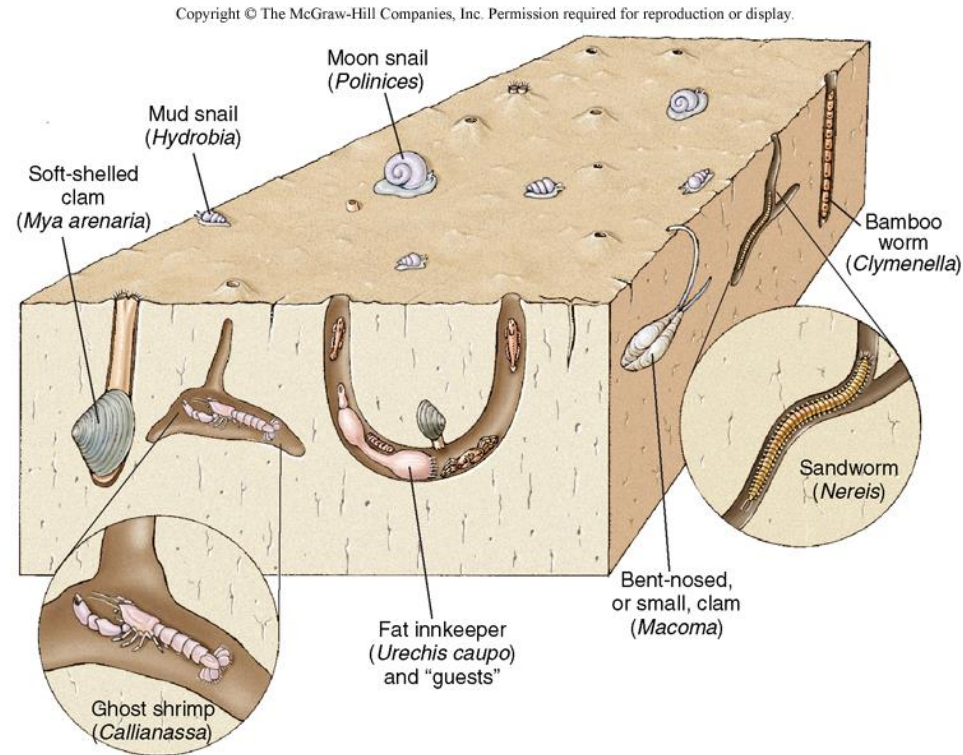


# Ramsar covers

- Natural and human-made wetlands
- inland/freshwater:
  - marshes, rivers, lakes, reservoirs etc.
- coastal/marine
  - lagoons, estuaries, mangroves, coral reefs, seagrass beds etc.
- above ground and underground
  - karst and caves
- but **not** deep oceans

# Mud flats

- Most animals are infauna and are usually feeding on detritus
  - Deposit feeders also oxygenate the sediment with their burrows

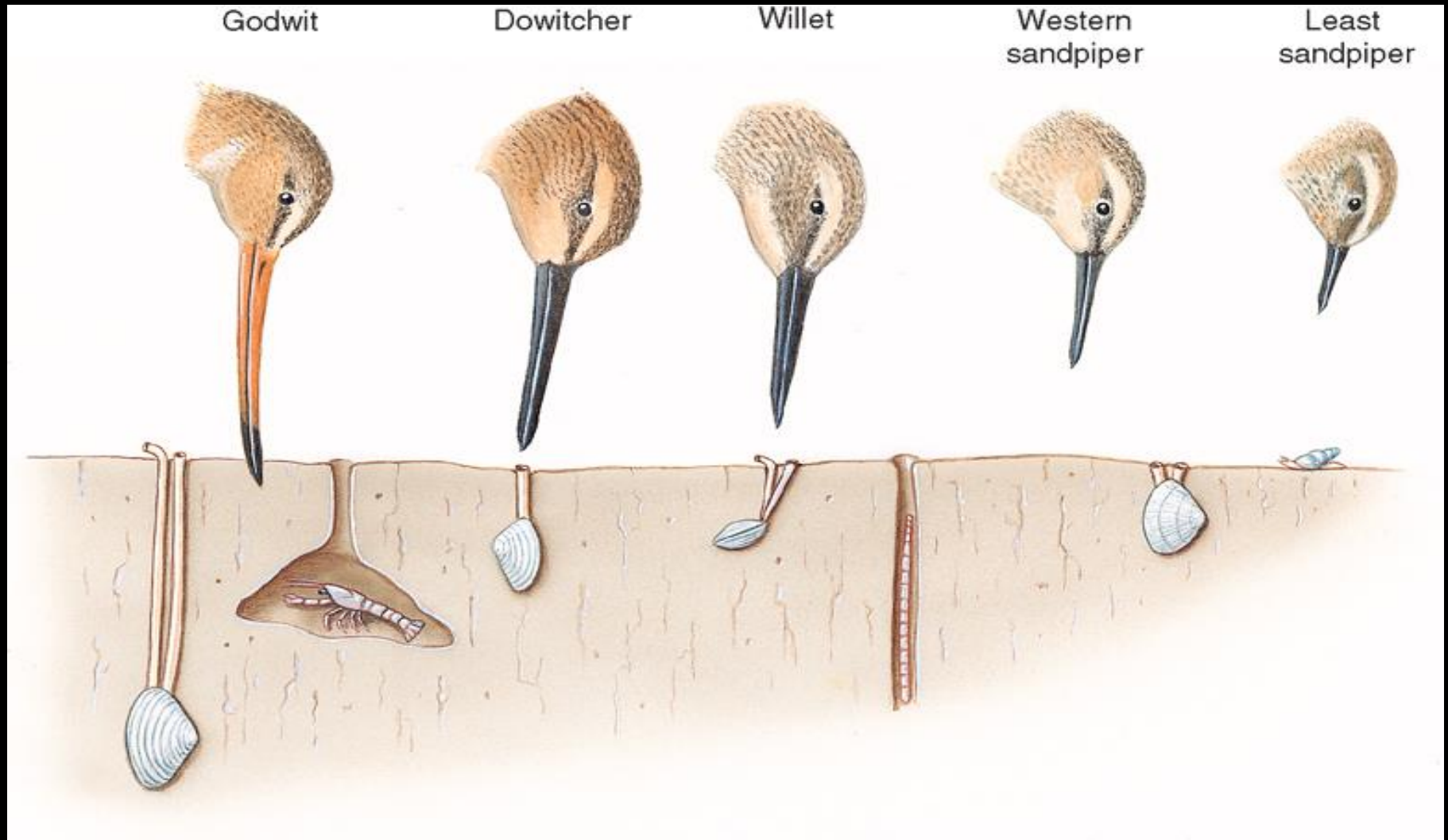




**MUDFLATS AND  
MARSH CREEKS  
SERVE AS  
SPAWNING  
GROUNDS FOR  
MANY SPECIES  
OF FISH.**



**Birds have also evolved to take advantage of abundant food sources on mudflats.**





*Thanks!*