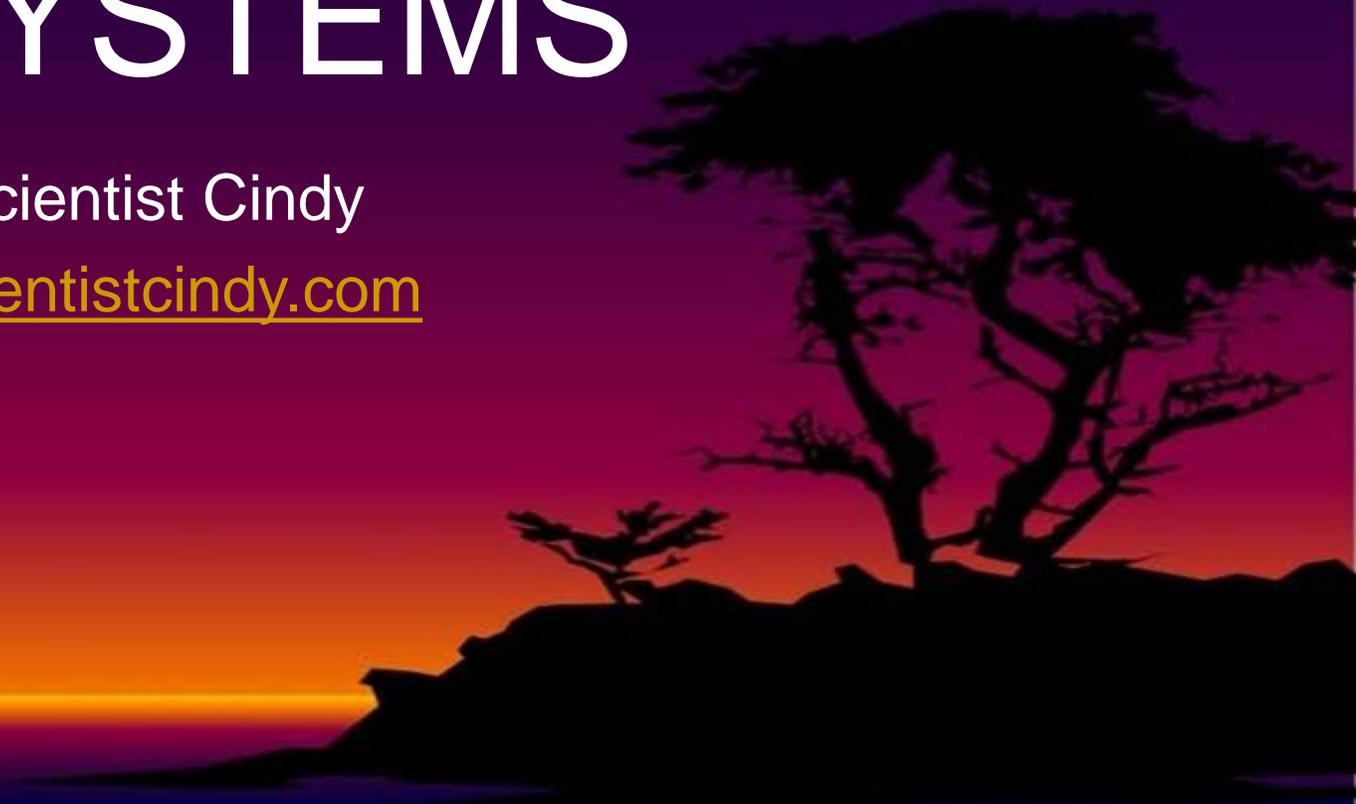


ECOSYSTEMS

With Scientist Cindy

www.scientistcindy.com



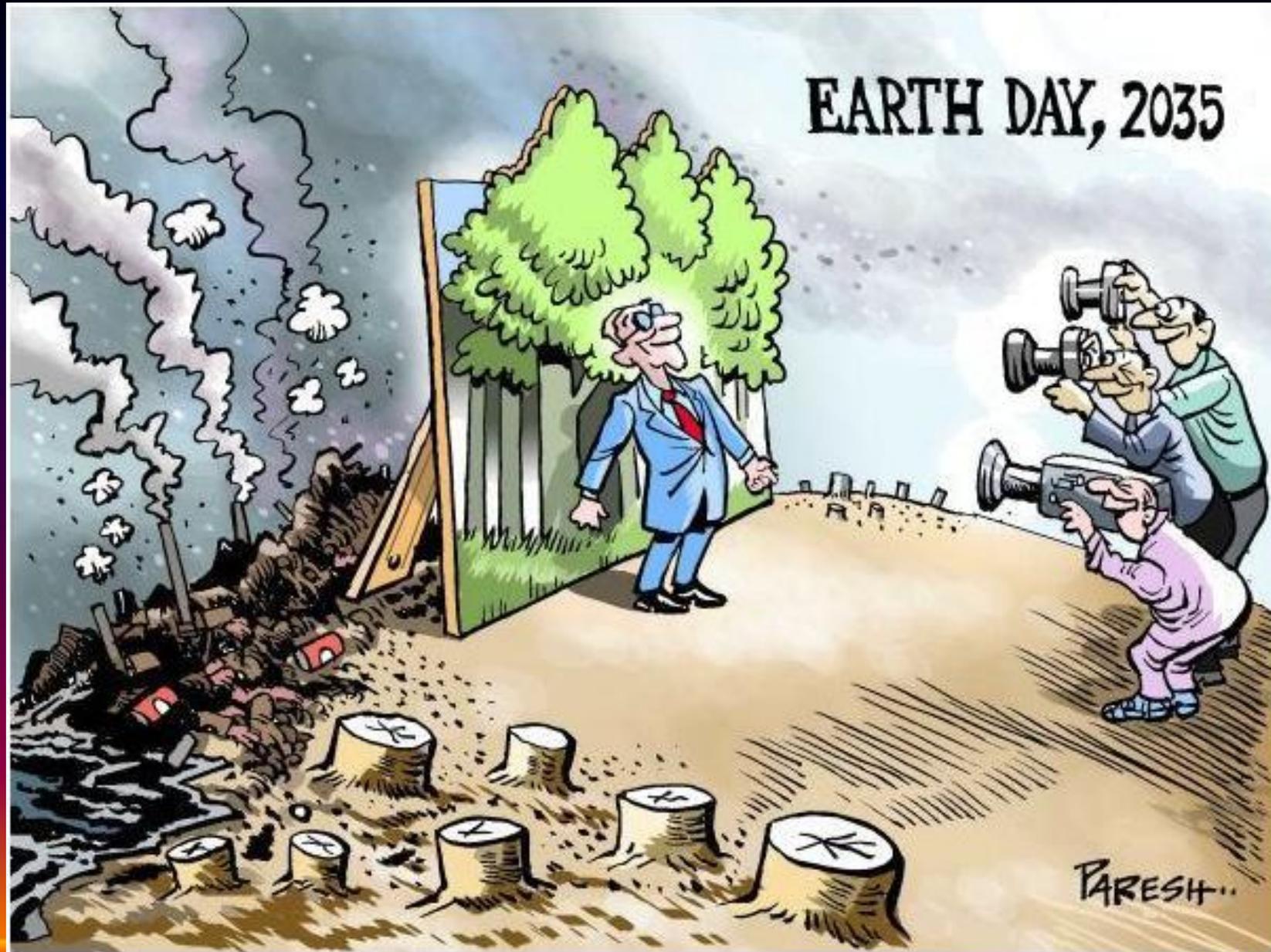
What should you learn?

- You should be able to...
 - define ecology.
 - distinguish among the following ecological levels: population, community, ecosystem, landscape, and biosphere.



ECOLOGY

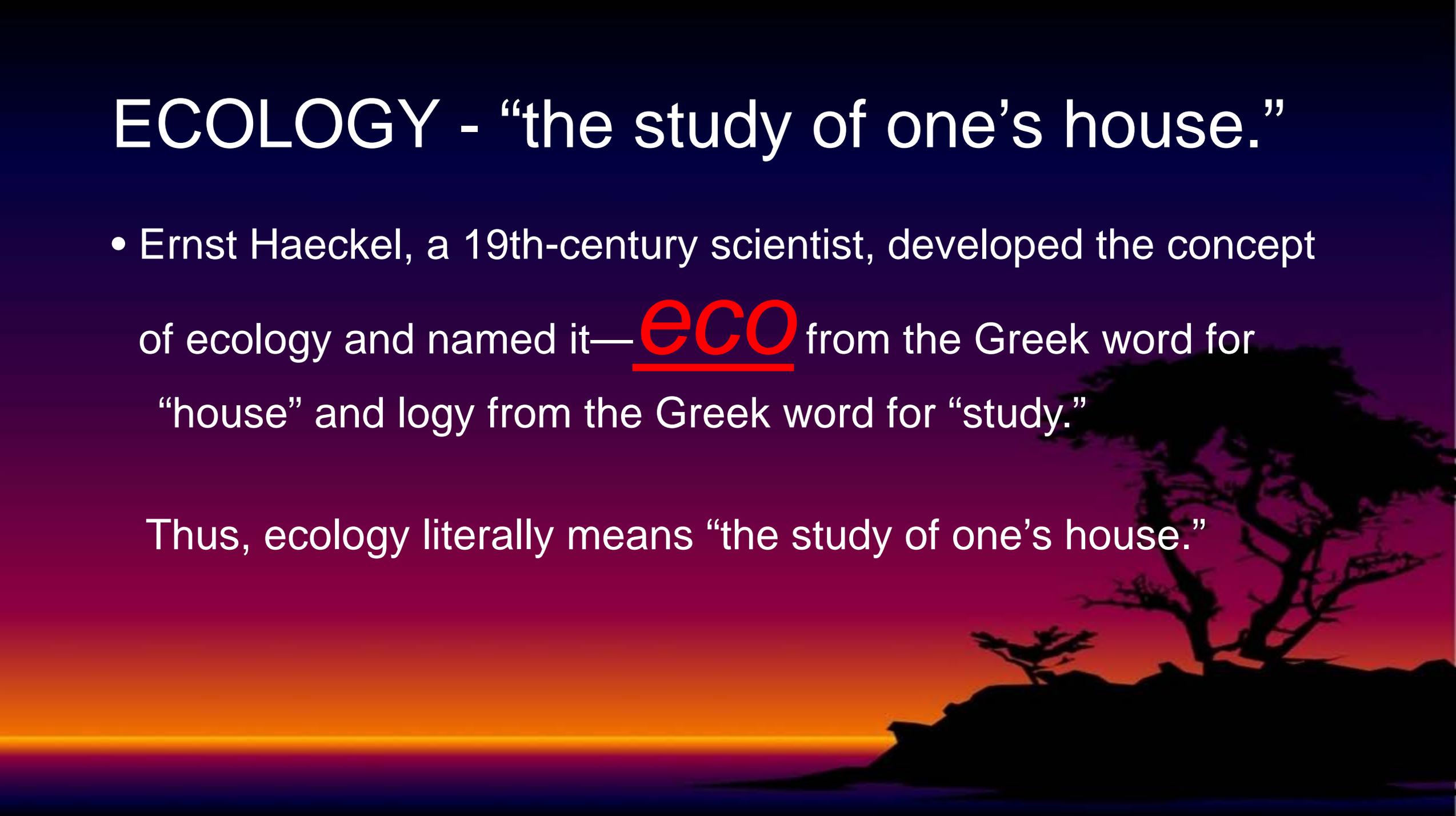
The study of systems that include interactions among organisms and between organisms and their abiotic environment.



ECOLOGY - “the study of one’s house.”

- Ernst Haeckel, a 19th-century scientist, developed the concept of ecology and named it—eco from the Greek word for “house” and logy from the Greek word for “study.”

Thus, ecology literally means “the study of one’s house.”



The environment consists of two parts

The environment consists of two parts

1. the biotic (living) environment
 - a. which includes all organisms
2. abiotic (nonliving, or physical) surroundings
 - a. Space / territory
 - b. temperature
 - c. sunlight
 - d. soil
 - e. wind
 - f. precipitation

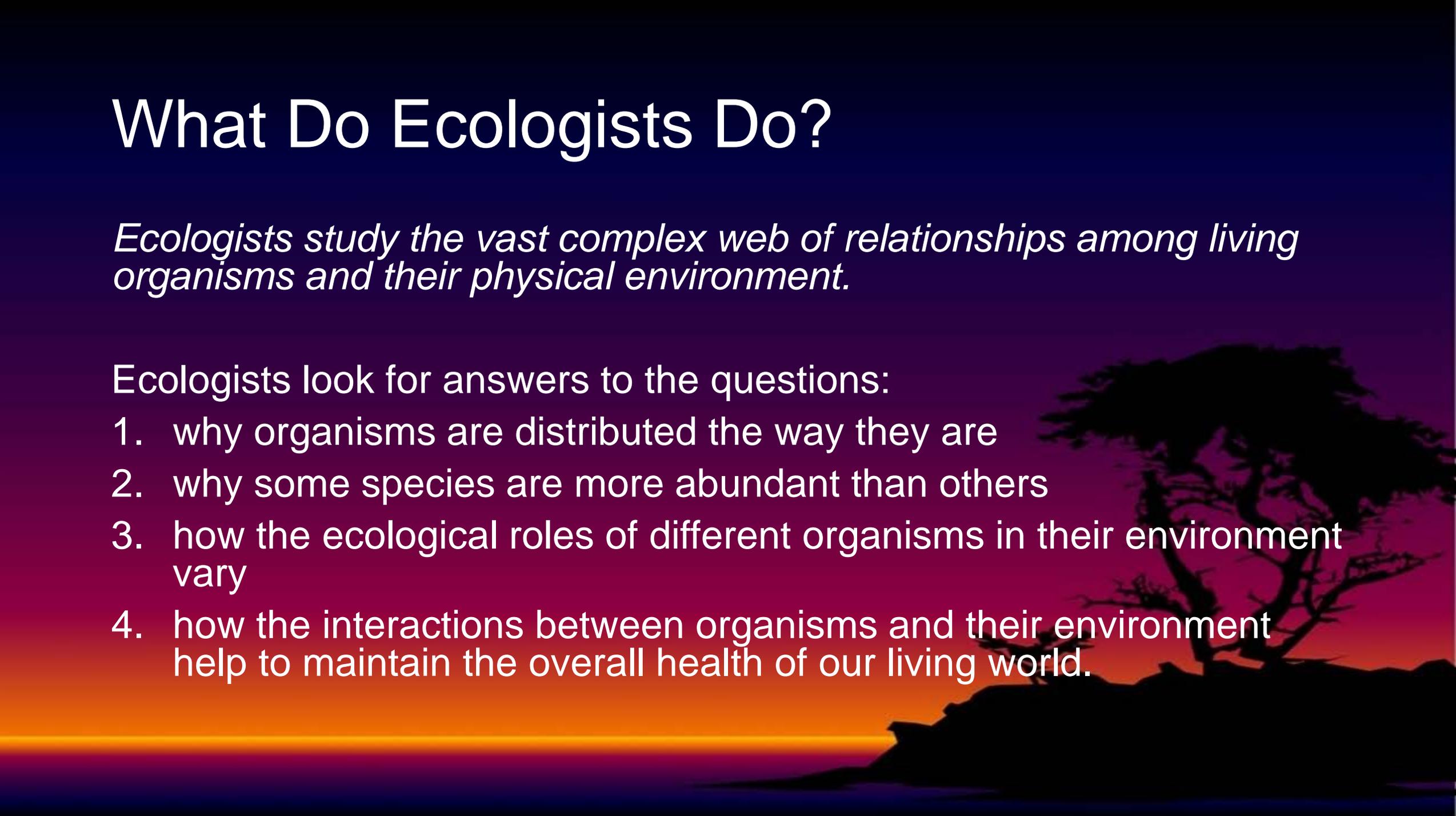


What Do Ecologists Do?

Ecologists study the vast complex web of relationships among living organisms and their physical environment.

Ecologists look for answers to the questions:

1. why organisms are distributed the way they are
2. why some species are more abundant than others
3. how the ecological roles of different organisms in their environment vary
4. how the interactions between organisms and their environment help to maintain the overall health of our living world.



Can You...

1. Identify the biotic factors?
2. Identify the abiotic factors?
3. Predict how the ecosystem would be different at high tide?
4. Predict how the ecosystem would be affected after a severe flood?

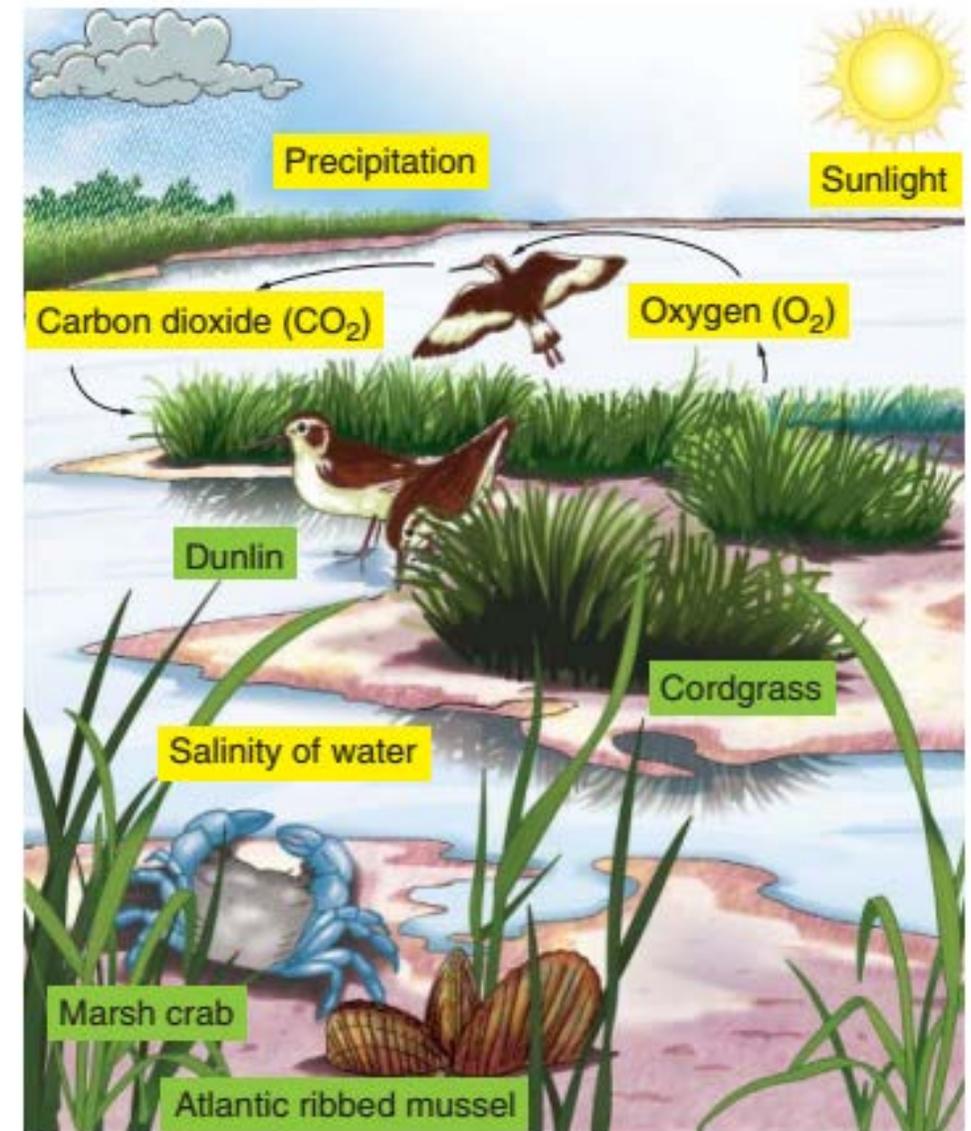


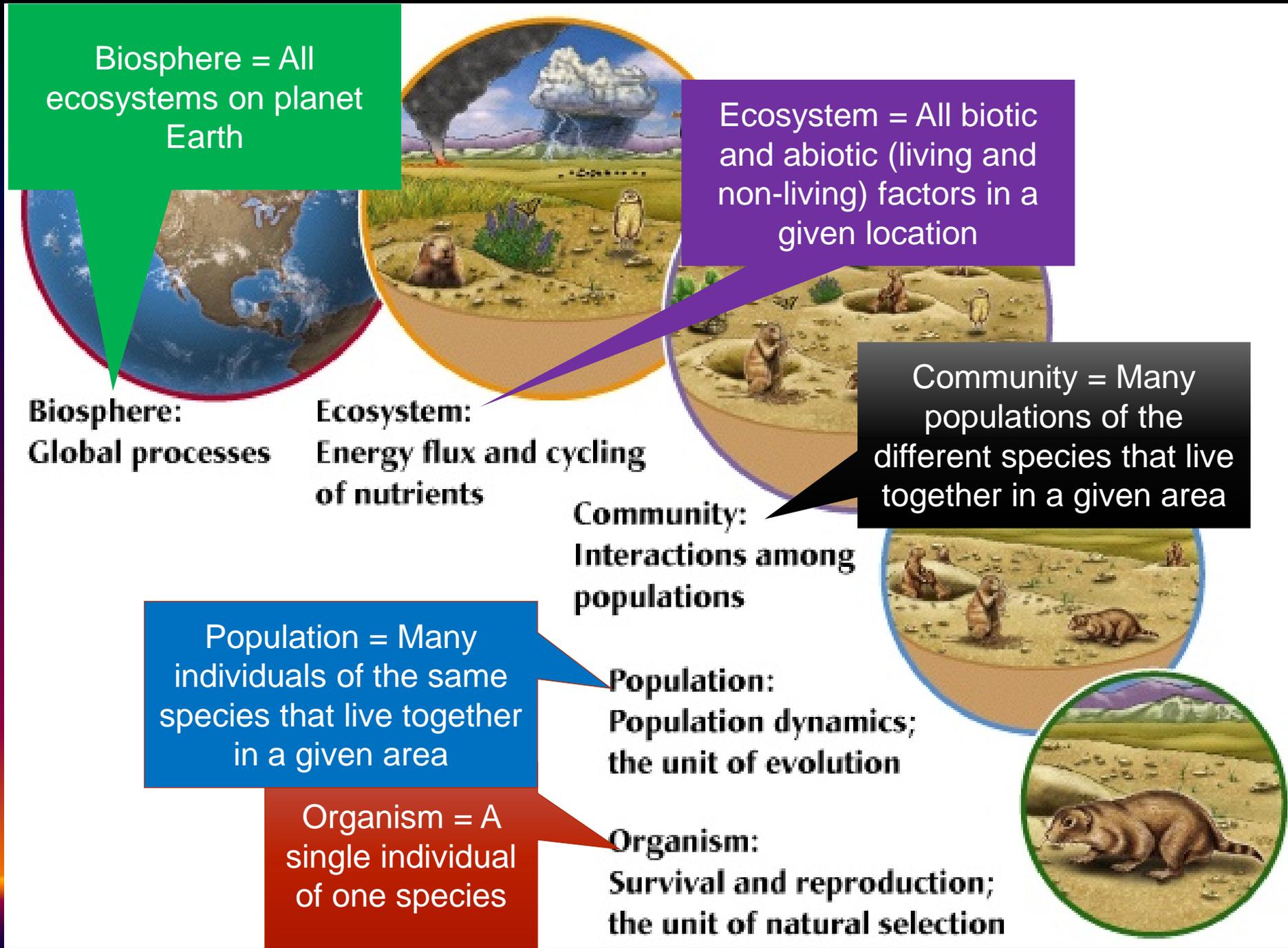
Figure 3.1 Some abiotic and biotic components of a Chesapeake Bay salt marsh. Shown is a mudflat at low tide. Abiotic (nonliving) components are labeled in yellow and biotic (living) components, in green.

Ecology

- Ecology is the broadest field within the biological sciences, because it is linked to every other biological discipline.
- The universality of ecology links subjects that are not traditionally part of biology.
 - Geology and earth science - takes into consideration the physical environment of planet Earth.
 - Chemistry - knowledge of chemistry is necessary to understand chemical reactions in the atmosphere, the soil, and living organisms (example – photosynthesis)
 - Physics - the principles of physics reveals the laws of thermodynamics.
 - Sociology - Humans are biological organisms, and our activities have a bearing on ecology.
 - Economics – economic dependence on industries that harm the environment such as farming, deforestation, power plants, fossil fuels etc.
 - Politics have profound ecological implications – control over resources

Levels of Organization

Ecologists study the levels of biological organization from individual organisms to the biosphere.



The coral reef community.

This is a great example of a community.

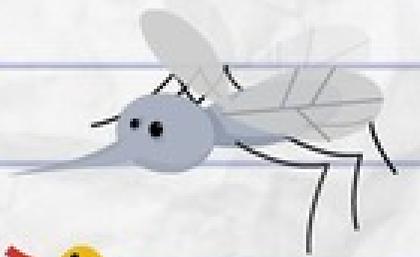
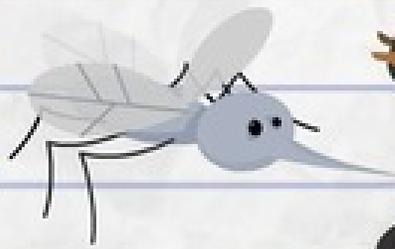
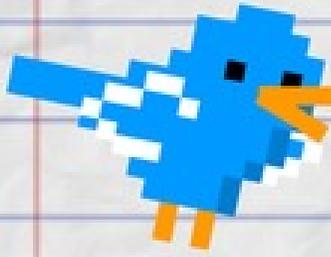
Gerald Nowak/Nat of Frame/Alamy Fotostock



Figure 3.3 Coral reef community. Coral reef communities have the greatest number of species and are the most complex aquatic community. This close-up of a coral reef in the Caribbean Sea off the coast of Mexico shows a green moray eel, French grunts, and several species of coral. Today many coral reefs worldwide are threatened by global climate change. How can they be protected from warming temperatures?

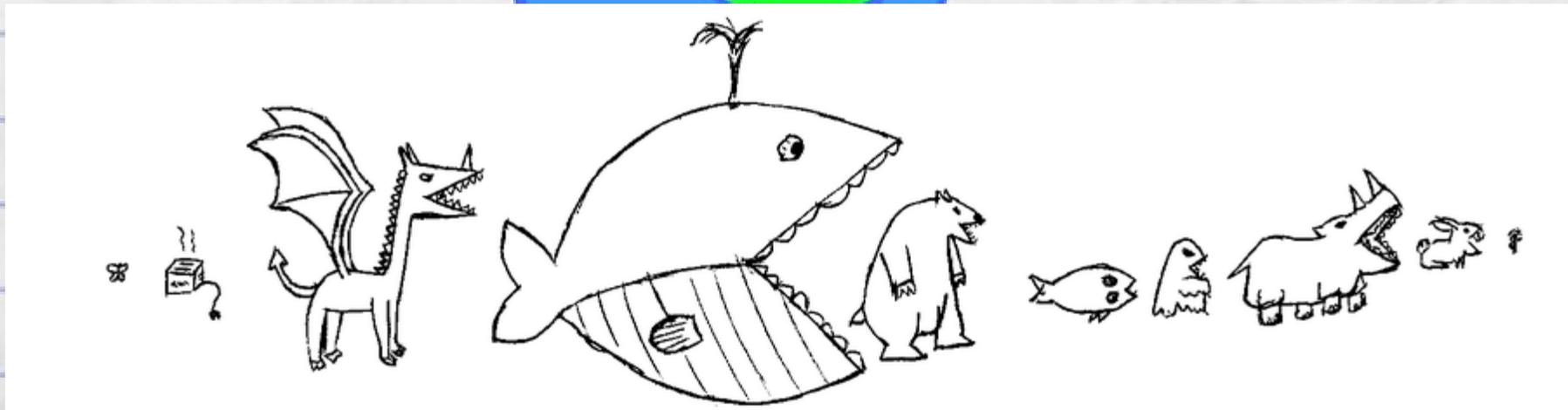


Lots of things live here
we share our world with them all



with creation big and small

Earth is home to millions of species of life...



An Ecosystem Consists of Biotic and Abiotic Factors

ABIOTIC COMPONENTS

Sunlight
Temperature
Precipitation
Water or moisture
Soil or water chemistry (e.g., P, NH₄⁺)
etc.

BIOTIC COMPONENTS

Primary producers
Herbivores
Carnivores
Omnivores
Detritivores
etc.

All of these vary over space/time



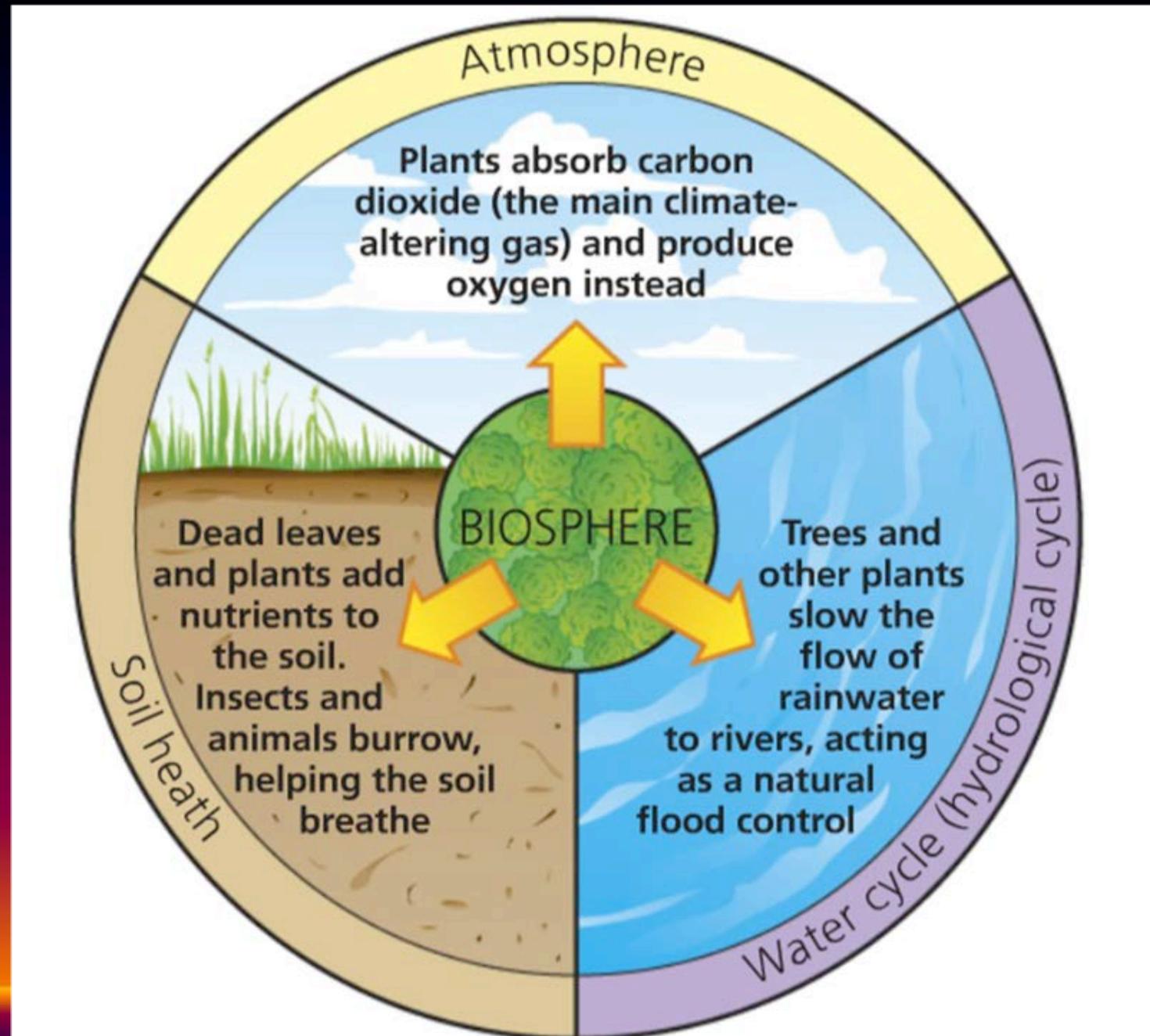
BIOSPHERE

- The Biosphere includes all organisms, populations, communities, ecosystems, and landscapes on Earth, as well as the Earth's physical environment: the atmosphere, hydrosphere, and lithosphere
- Raven, Peter H.; Hassenzahl, David M.; Hager, Mary Catherine; Gift, Nancy Y.. Environment, 9th Edition (Page 42). Wiley. Kindle Edition.



The Biosphere includes ...

1. **The atmosphere** = gaseous envelope surrounding Earth
2. **The hydrosphere** = Earth's supply of water (liquid and frozen, fresh and salty, groundwater and surface water.)
3. **The lithosphere** = the soil and rock of Earth's crust.



- Extreme cheapskates

<https://www.youtube.com/watch?v=11c4LRomkSo>

- The girl who silence the world for 5 minutes

<https://www.youtube.com/watch?v=xXiWi8LnZ7I>

