

1

Ecosystems

Geography 301
Week 7

**Lecture Notes**

### Organizing Marine Systems

- A marine system is an ocean **biome**. Elements in this **ecosystem** are characterized in one of two ways: **abiotic** or **biotic**.
  - The inorganic or abiotic elements include oxygen, water, and various minerals.
  - The biotic elements include the plants and animals living in the ocean.
- At the biotic level, there are three types of **organisms** to remember. These organisms all belong to the marine **food web**.
  - Producers**
    - Producers, or **autotrophs**, rely on abiotic resources for nourishment. Autotrophs are plants and algae, like **phytoplankton**.
    - These organisms occupy the first **trophic level** in the **food chain**. Thus, they are essential to most other organisms in a marine system.
  - Consumers**
    - Consumers, or **heterotrophs**, are organisms like zooplankton or **nekton** which survive by feeding on producers and other consumers. Their specific eating habits determine their sub-classification:
      - primary consumers/**herbivores** (mussels): eat autotrophs
      - secondary consumers (whales, lobsters): eat primary consumers
      - tertiary consumers/**carnivores** (seals, sharks): eat secondary consumers
      - tertiary consumers/**omnivores** (squids, sea turtles): eat both autotrophs and heterotrophs
      - detritivores** (sea cucumbers): eat already-dead autotrophs and heterotrophs

- Decomposers**
  - Decomposers, such as bacteria or fungi, break down dead organic matter and waste products.
  - The activity of decomposers reintroduces nutrients to the soil and water. Autotrophs then use these nutrients to restart the food cycle.

**Ex 1.** Read the lecture notes. Then, mark the following statements as *True* or *False*.

- 1 Autotrophs get most of their nourishment from biotic sources.
- 2 Herbivores and carnivores eat some of the same foods.
- 3 Decomposers produce nutrients for autotrophs.

True	False
True	False
True	False

**Ex 2.** Read the lecture notes again. Fill in the blanks.

A decomposer is an organism that processes  organic . This process releases compounds into the environment that  rely on for .

**Ex 3. Match the words with the definitions (A-E)**



autotroph   primary consumer   secondary consumer   trophic level   heterotroph

**A** any organism that eats other organisms

**B** an organism that eats producers

**C** an organism's position in a food chain

**D** an organism that eats consumers

**E** an organism that utilizes nonliving compounds

**Ex 4. Complete the brief essay on the marine ecosystem.**

A marine ecosystem is an underwater environment. Various

and biotic elements work together to make the  
 operate.

The biotic  of a marine ecosystem are the plants  
and  living there. They may be autotrophs,  
heterotrophs, or . The type of

an organism consumes determines its role within  
the food web.

Autotrophs are self-nourished producers. They're typically plants or

that sustain the other organisms. Heterotrophs are  
other-nourished . They survive by feeding on other  
organisms or what others produce. Thus, they eat animals, plants, or both.

Decomposers are the final group, and they consume

and decomposing . They  
 down organic materials and reintroduce  
 into the ecosystem.

