

Ecosystem

energy flows one way through it, matter cycles back

Ecosystem structure: what's living, what isn't



- **abiotic** components are the non-living part: climatic factors like temperature and rainfall
- also edaphic factors like soil, plus the inorganic and organic substances present
- **producers** are the autotrophs, mostly photosynthetic, that fix energy into the system first
- on land they are plants; in water, phytoplankton and algae
- **consumers** are heterotrophs split by diet: primary (herbivores), secondary (eat herbivores), tertiary (eat carnivores)
- **decomposers**, mainly bacteria and fungi, break down dead organic matter using enzymes secreted outside their cells

The four components *

Ecosystem components



three biotic roles plus the non-living backdrop they all depend on

Grazing food chain vs Detritus food chain

Grazing food chain

- starts from **living producers**: plant eaten by herbivore, herbivore eaten by carnivore
- the more familiar of the two, and the one most food-web diagrams draw

Detritus food chain

- starts from **dead organic matter**: detritus is consumed and broken down by decomposers and detritivores
- in many ecosystems, especially forests, this pathway processes more energy than the grazing chain does

Trophic levels, in sequence

Producers

1st

fix energy from sunlight via photosynthesis

→
eaten by

Primary consumers

2nd

herbivores, feeding directly on producers

→
eaten by

Secondary consumers

3rd

primary carnivores, feeding on the herbivores

→
eaten by

Tertiary consumers

4th

secondary carnivores, feeding on other carnivores

