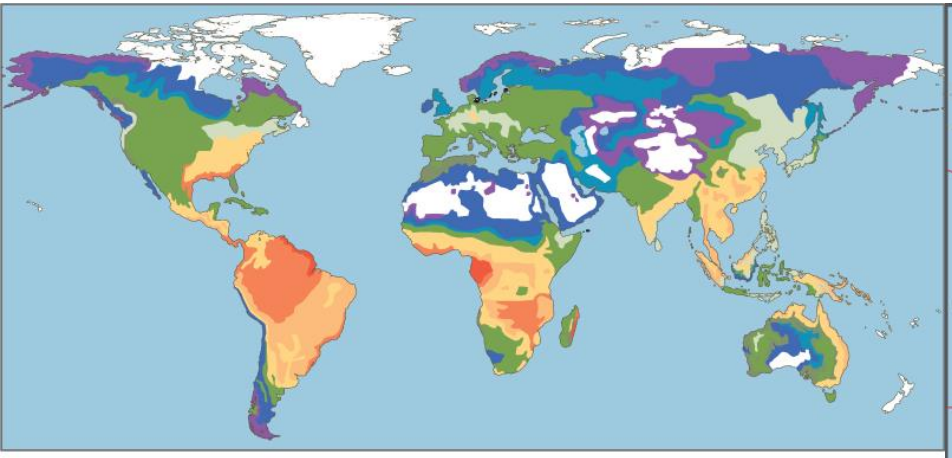
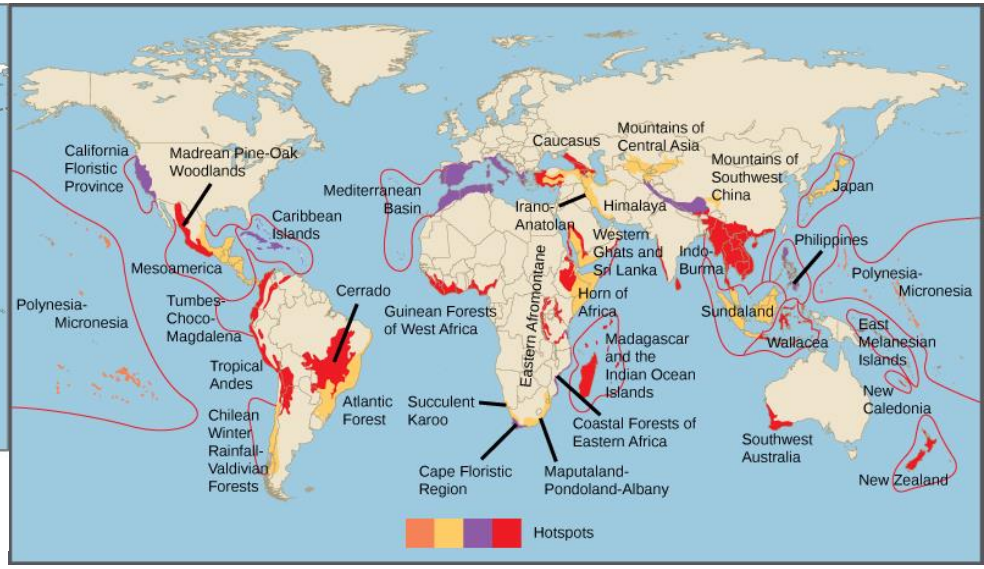
7.8: The diversity of species within an ecosystem may influence the stability of the ecosystem.

1. ECOSYSTEM STABILITY

Not All Ecosystems Are Equal

Different ecosystems have different amounts of **biodiversity**.





Diversity = Stability

There is a direct relationship between biodiversity in an ecosystem and the stability of the ecosystem.

Genetic Diversity

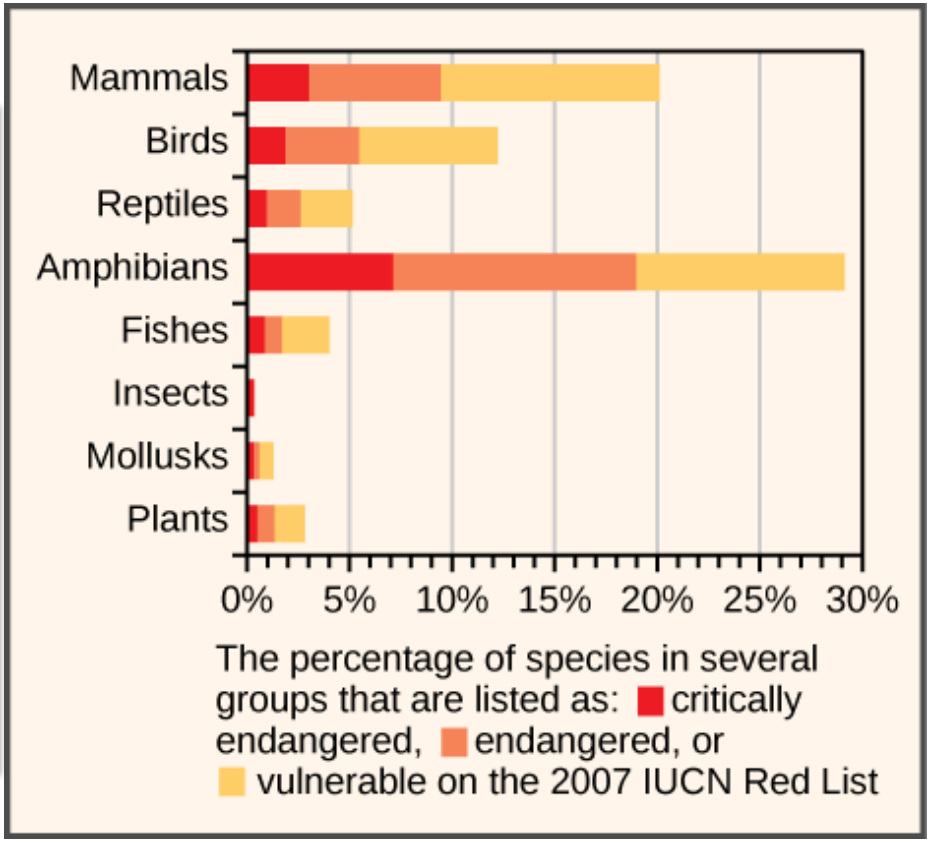
Species Diversity

Biome Diversity

Why?

Ecosystems are **interaction networks**. The more components in the ecosystem, the more possible interactions. The less important any one interaction is to the total system

Decreasing biodiversity decreases the number of the components in the system, and increases the reliance on any remaining interactions. If those interactions are disrupted, the ecosystem may collapse.



Keystone Species

Species that have a large role in maintaining ecosystem structure.

Removal has a large effect on the ecosystem.

Ex. Sea Otters

Ex. Sea Stars

Facilitation: making an ecosystem suitable for other species to occupy.

Ex. Beavers

Producers

Have a central role in affecting the structure of the community.

Limiting environmental factors also contribute to ecosystem structure and stability.

Ex. Limited space on a coral reef

7.9: Distribution of local and global ecosystems changes over time.

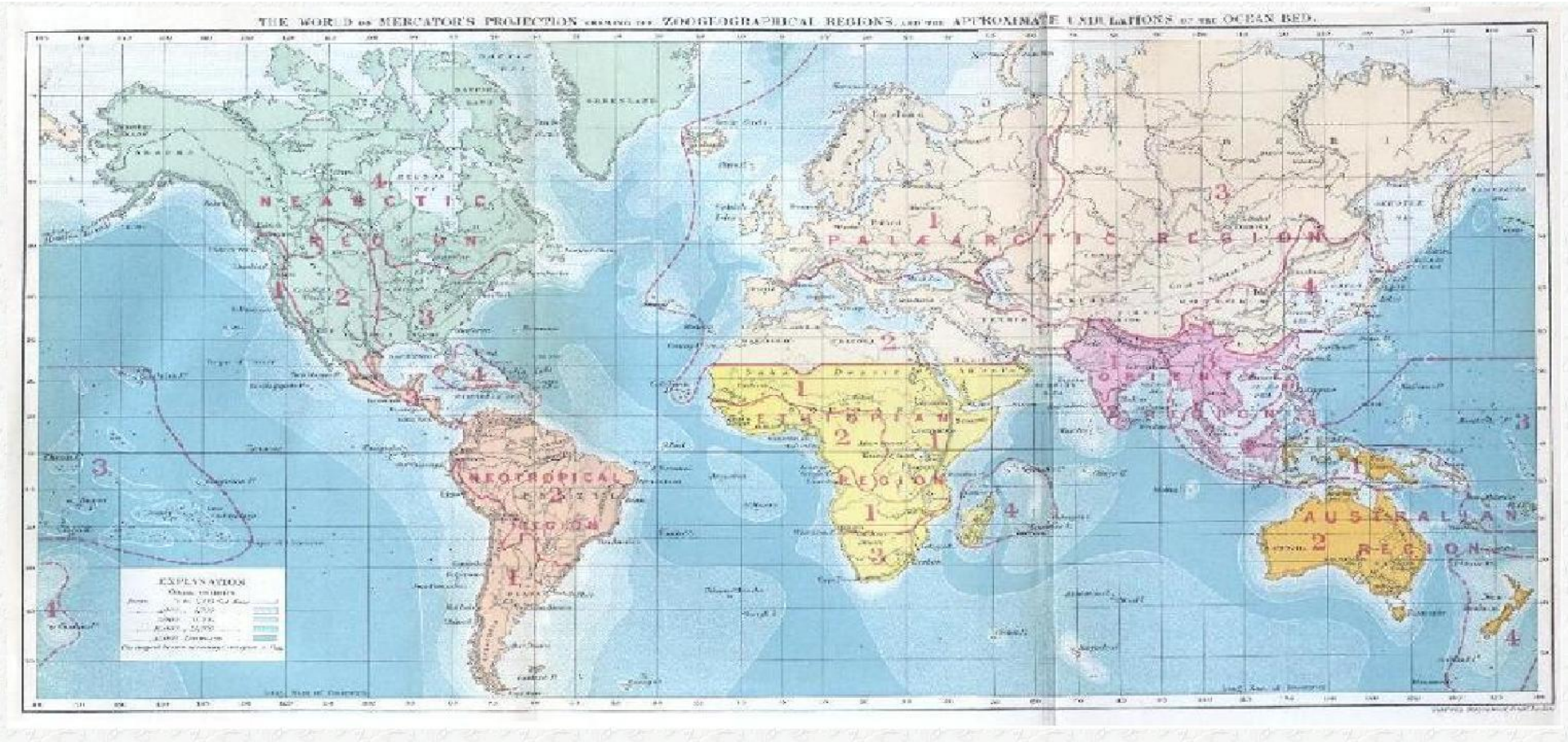
1. ECOSYSTEM CHANGES

The only constant is change

Ecosystems are constantly changing.

Disturbance: Anything that disrupts the homeostat

Ecosystems are a function of local conditions.



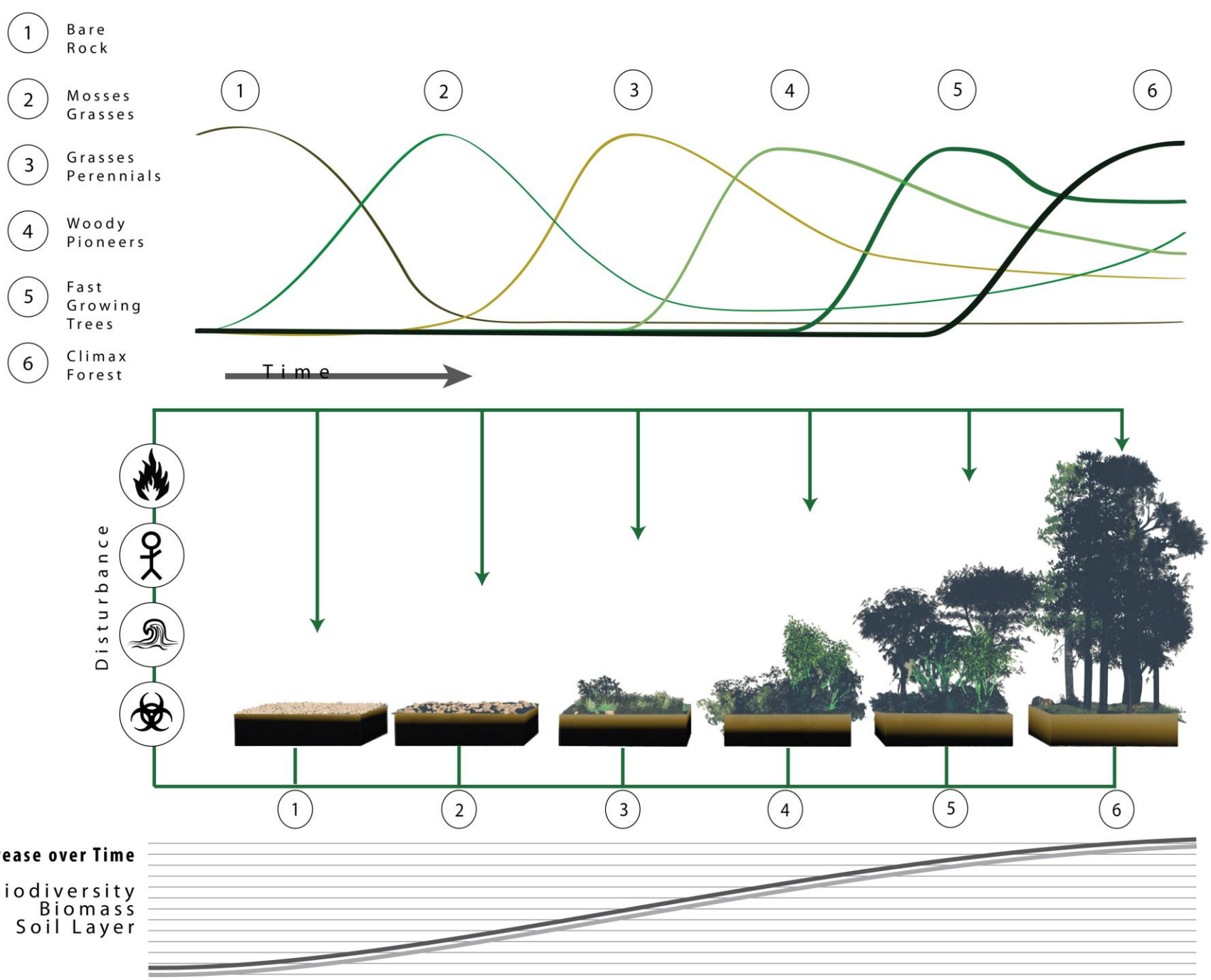
Local Conditions Change.

Ecosystems are resilient

Ecosystems have processes to recover from disturb

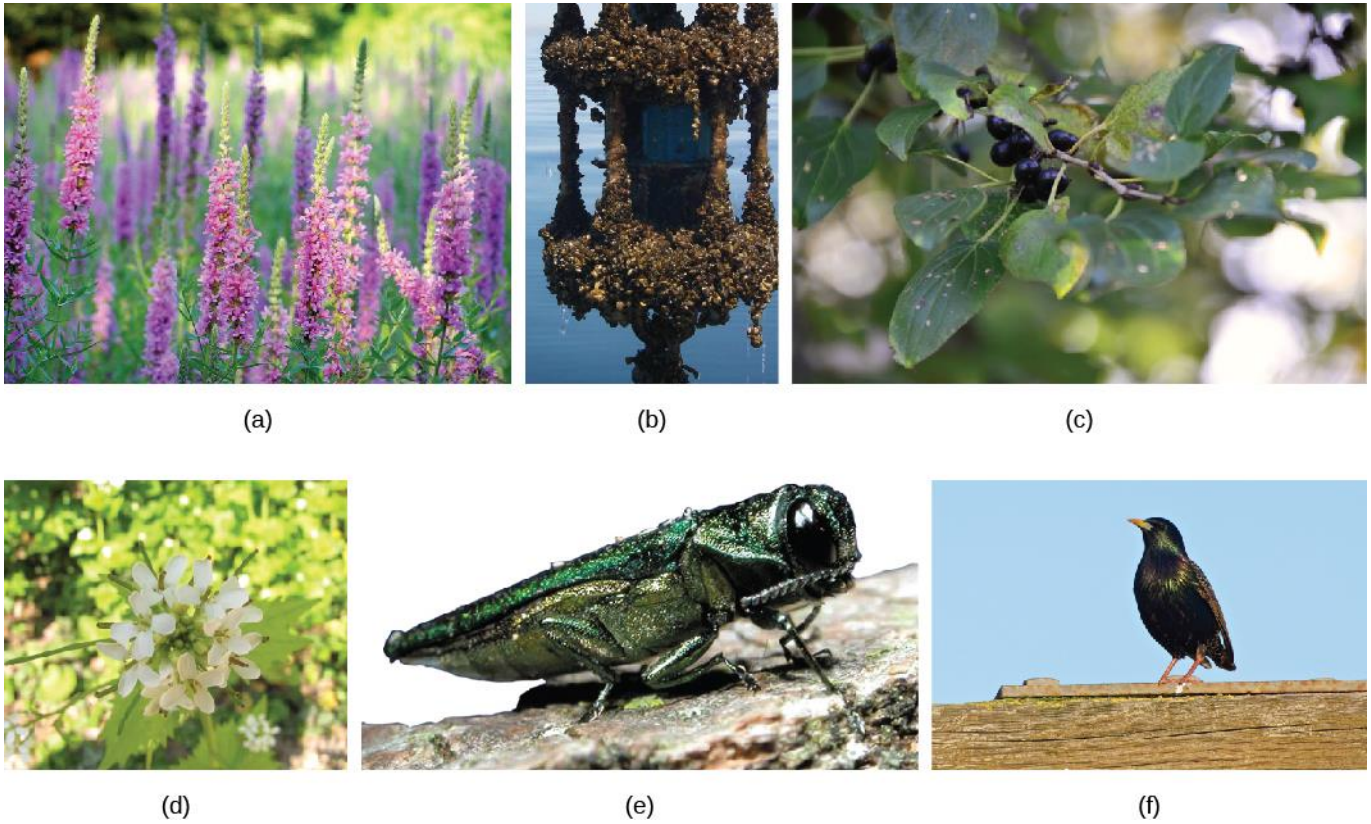
“Nature Abhors a Vacuum”

Forest Succession Over Time In Six Stages



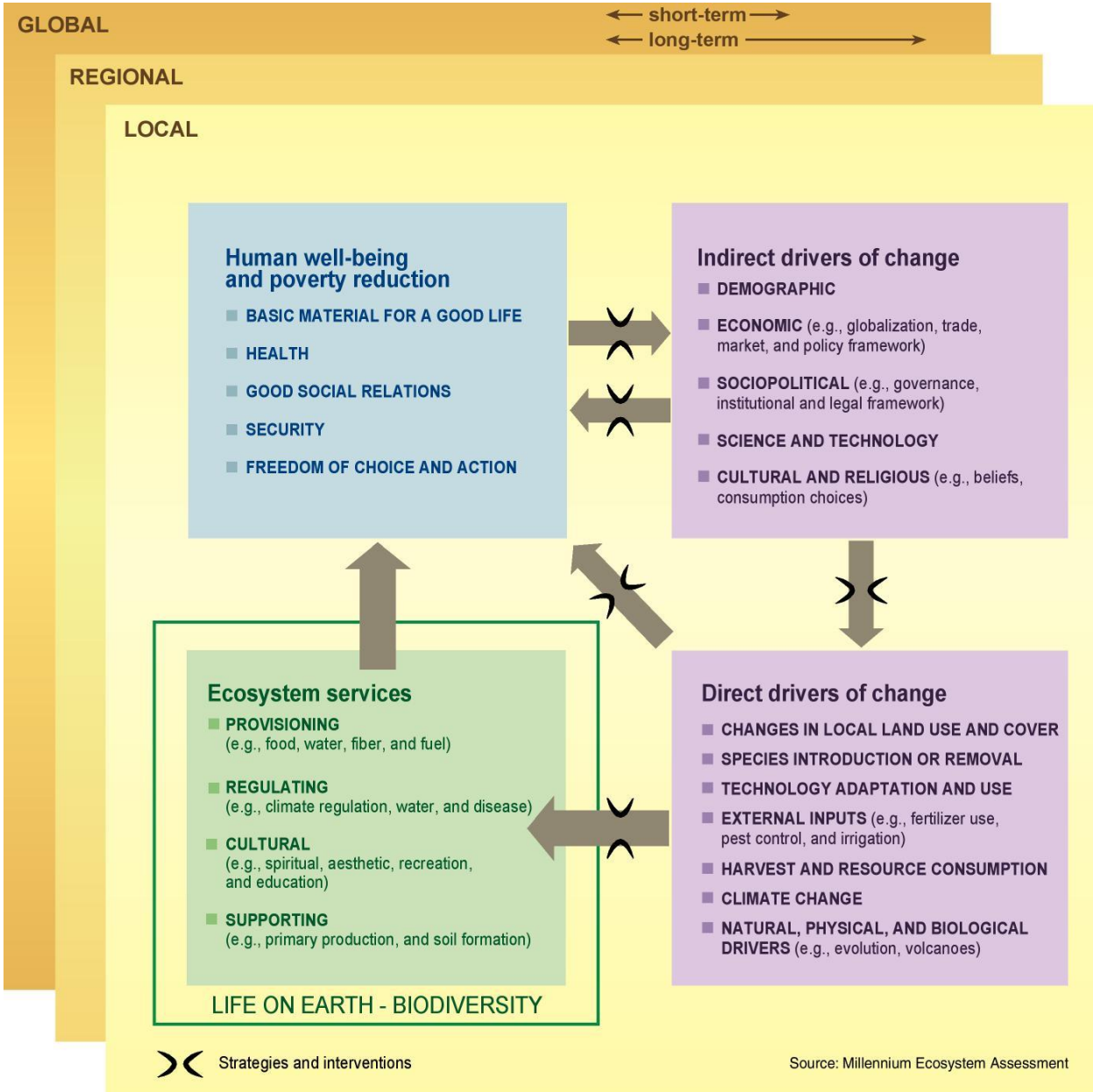
Human Impacts

Human impacts are a geologically novel source of complex disturbances for the ecosystems we occupy.



Ecosystems Enable Human Society

Earth's ecosystems provide humans with a variety of "ecosystem services" that we can not replace or survive without.



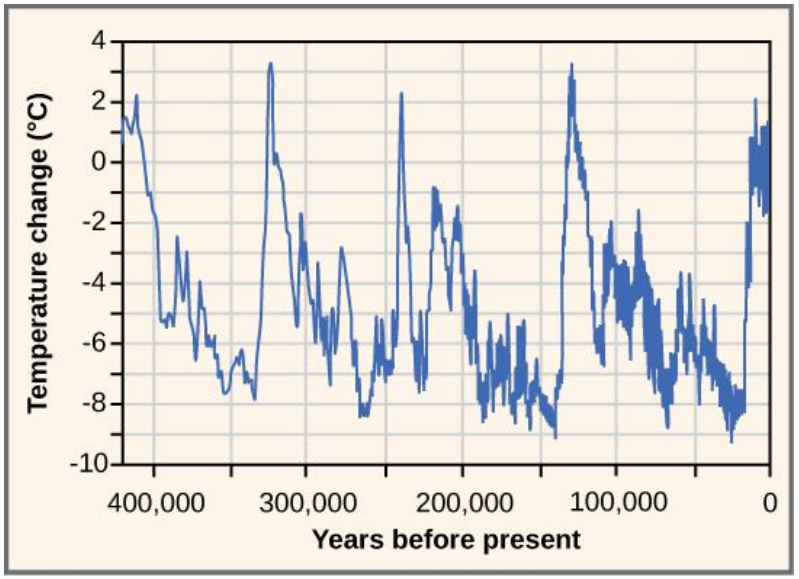
Ex. Fossil Fuels

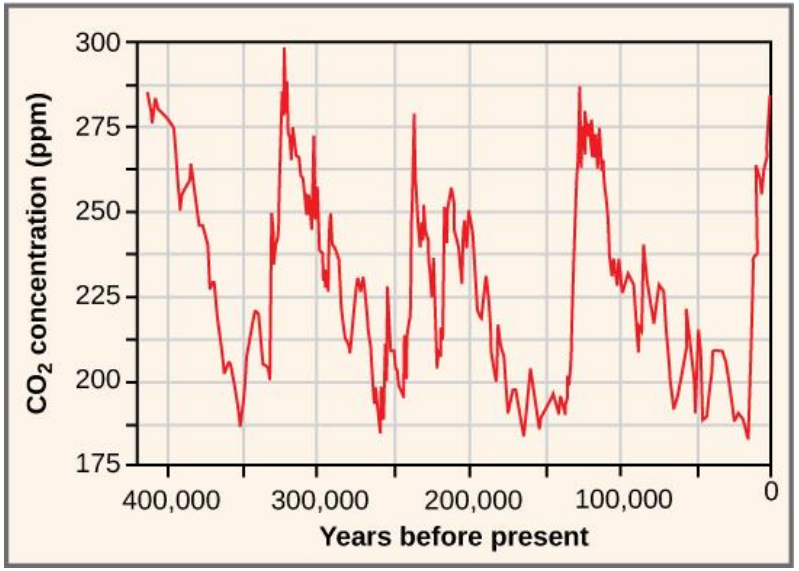
Consider the various interactions that humans engage in when extracting and using fossil fuels.

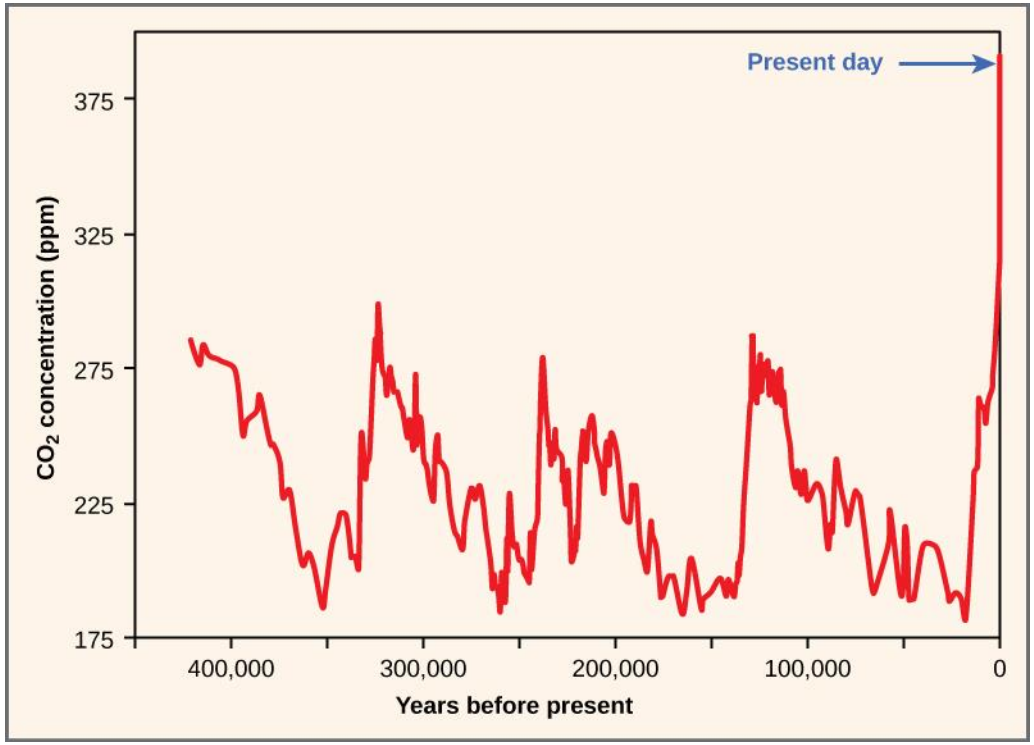
How many interactions are “positive”? How many are “negative”?

Models have limitations

We are able to model our interactions with the environment, but models are always simplifications, and our interactions are always complex.



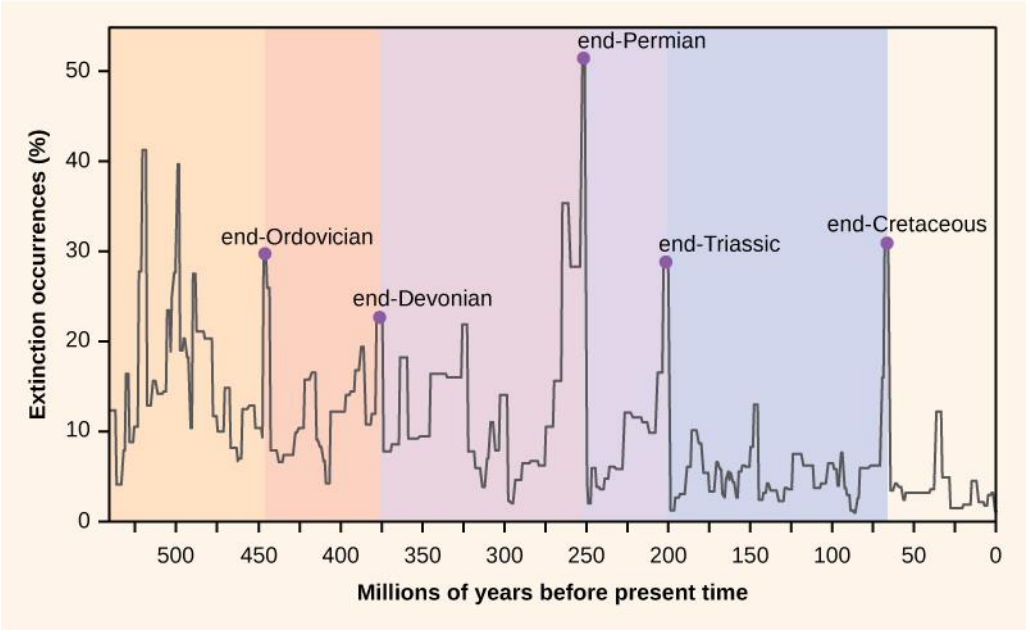




How are Humans Affecting Earth?

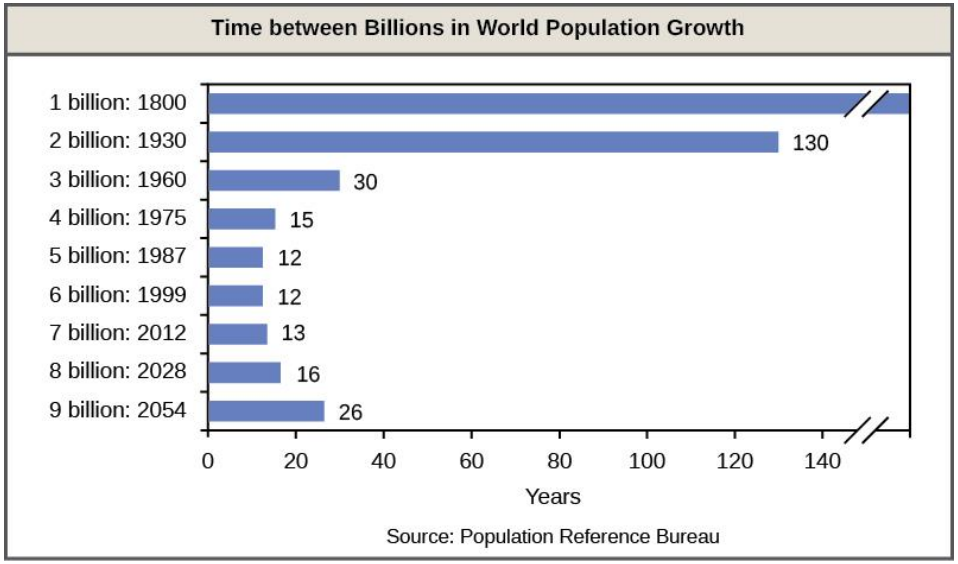
This question can not be easily answered, but the vast majority of data suggests that we are having a negative effect on the structure of Earth's ecosystems.

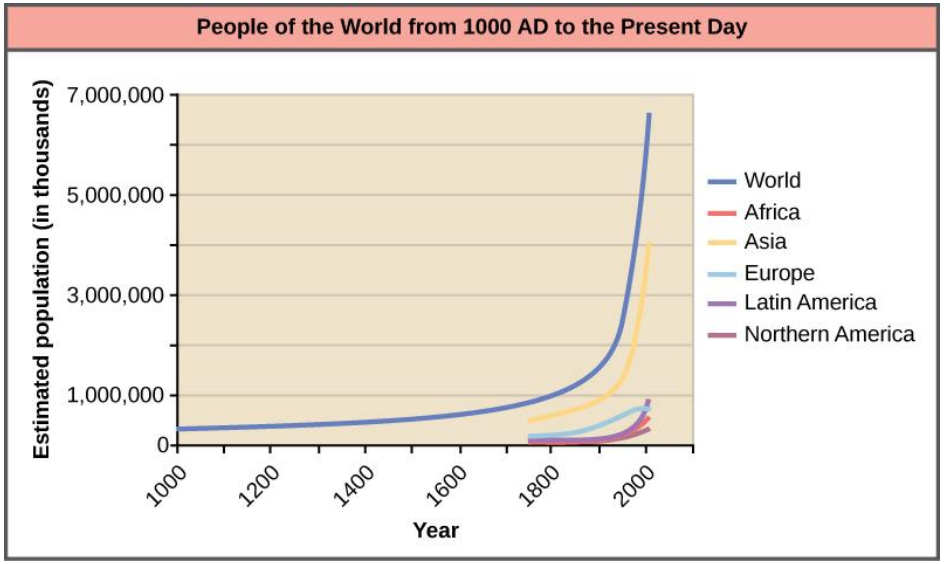
"The sixth great extinction" ?



Human Impacts are Accelerating

As the number of humans on Earth has increased, our impact on the environment has also increased.





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