

Review of Key Information from Part Two

Why are ecosystems important?

Humans are part of the natural world from which we emerged. We depend on Earth's living systems for the food we eat, the water we drink, and an abundance of other products, cultural benefits, and spiritual values. Our life and livelihood depend on healthy ecosystems.

How is global climate change changing the spruce bark beetle's affect on the Alaska ecosystem?

With higher temperatures, more beetle larvae are able to survive, and the insects can mature faster, completing a two-year life cycle in just one year. A growing population of these beetles has killed nearly 4 million acres of mature white spruce forest. Over the past fifteen years, the spruce bark beetle has killed 40 million trees in southern Alaska, more than any other insect in North America's recorded history.

Will global climate change affect the Great Lakes ecosystem?

Global climate change is expected to affect shoreline wetlands of the Great Lakes, which provide critical habitat for breeding and migrating waterfowl, especially diving and sea ducks.

The loss of fishing opportunities due to climate-induced changes in fisheries could be severe in some parts of the country.

How is global climate change affecting the Inuit on the Arctic coasts?

The Inuit have already crossed an economically and culturally damaging threshold.

The half-frozen edge between salt water and floating ice creates an environment that favors the remarkable growth of microscopic plankton. These phytoplankton lie at the base of the marine food chain and convert sunlight and carbon dioxide into organic carbon – food for everything else. Smaller animals such as shrimp-like krill feed on plankton and are themselves eaten by larger organisms, from small fish to the biggest whales.

How is global climate change affecting Africa's Sahel region?

The climate in Africa's Sahel region shifted during the 1960s. Thirty-five years after the sudden decline in rainfall there is still no sign of the life-giving monsoon rains. The 500 million people who live in the world's desert regions will find life increasingly unbearable as temperatures soar and water is used up or turns salty.

How is global climate change impacting catastrophic weather events?

Warm water vapor rising from the sea energizes massive storms. Category 4 and 5 hurricanes have doubled since 1990. Researchers have discovered that the increase in these severe storms is directly linked to the rising temperatures of tropical oceans. In the 1960s, around 7 million people were affected by flooding each year. Today, 150 million are. As sea levels rise, India and Bangladesh will have to draw up permanent relocation plans for millions of people.

How will global climate change affect communities around the globe regarding diseases like malaria?

Because of climate change, the malarial season will be extended and the disease will explode. Tens of thousands of people live in mountain valleys around the world, where disease is rare.

Global climate change will allow malaria access to these communities, which have no resistance to the disease.

What is a feedback loop and why is it so important to global climate change?

As the Earth heats up, glaciers melt turning one of the highest reflective surfaces (ice) into one of the lowest (ocean and forest). With less ice and more ocean and forest on the surface of the Earth, more heat will be absorbed by Earth and less reflected back into space. This will cause the Earth to heat up even more, melting glaciers more quickly, and covering the Earth's surface with added dark surfaces. Scientists consider feedback loops the single-biggest threat to civilization from global warming.

What are the financial costs of catastrophic weather events due to global climate change?

The financial cost of global climate change is ballooning. In the 1970s, costs associated with natural catastrophes amounted to about \$4 billion a year. By 2004, the total was \$123 billion. In 2005, with hurricanes Katrina, Rita and Wilma, losses exceeded \$200 billion.