

# Regents Living Environment

## Ecology and Human Impact on Ecosystems

### Part I Ecology

#### Ecology Vocabulary

Pioneer Organisms	Biosphere	Ecosystem	Community
Population	Succession	Biotic	Food web
Autotroph	Biomass	Producer	Heterotroph
Omnivore	Carnivore	Predator	Prey
Scavenger	Saprophyte	Commensalism	Mutualism
Parasitism	Climax Community	Ecology	Abiotic

#### **Ecology**

The study of the interaction between living organisms and the physical environment.

All living things are dependant on other living things and nonliving things to survive.

#### **Biosphere**

The portion of the earth where life exists.

#### **Ecosystem**

All the living things and the physical environment functioning together in a specific area.

#### **Community**

All the organisms in a specific area living together at the same time.

#### **Population**

All the members of the same species living together in the same area at the same time.

## How Ecosystems Function

Ecosystems involve the interaction between abiotic and biotic factors.

Abiotic	Biotic
not living and never was	living or made by living things
sunlight	animals
water	plants
air	bacteria

Ecosystems are self- sustaining units.

Ecosystems must have a constant source of energy usually the sun.

Ecosystems have the ability to cycle and recycle materials in them.

## Biotic Factor Relationships

Living things transfer energy from the sun by photosynthesis to other organisms by eating.

### Food chain or web

Shows the path of energy from the sun to other organisms. The more complex the path the more stable the ecosystem will become.

### Autotrophs or Producers

Organisms that make their own food by photosynthesis from sunlight and CO<sub>2</sub>.

Make up most of the **Biomass** of the ecosystem.

### Heterotroph or Consumer

Depend on the organism for food

### Omnivores

Eat both plants and animals

## Carnivores

Eat other animals.

**Predators** hunt living **prey**.

**Scavengers** eat dead animal they find.

## Saprophytes or Decomposers

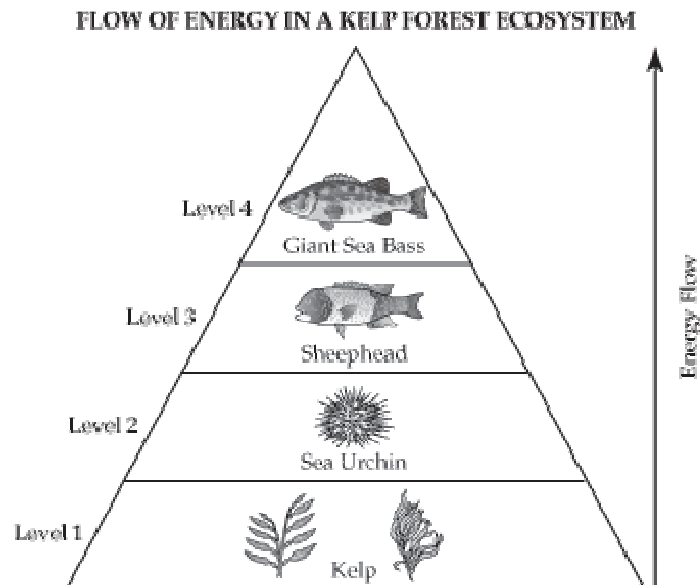
Use dead material and waste from other living things for energy.

Return nutrients back to the ecosystem to be reused.

Examples are fungi mold and bacteria

## Ecosystem Energy Pyramid

In each transfer of energy a small amount (10%) is lost so a constant input in is required.



## Other Biotic Factors

### Symbiotic Relationships

Relationships between organisms that live together in a close association.

### Commensalism

One organism benefits and the other organism is not harmed

Example a fern living under the shade of a tree

### Mutualism

Both organisms benefit

Example protozoa in a cow's stomach

### Parasitism

One organism is harmed while the other organism benefits

Example tapeworms living in a human's digestive system

### Mutualism



## Competition In Ecosystems

Different species living in the same habitat are unlikely to use the same limited resources

### Niche

The resources used by a member of the ecosystem community. Only one species per niche can survive in nature. Parts of a species niche may overlap with another species.

## **Ecosystem Formation**

An area's climate is the main factor in determining the type of ecosystem that will form.

### **Ecological Succession**

The step-by-step replacement of one community by another community until a stable ecosystem is reached

### **Pioneer Organisms**

The first living things to populate an area

Examples Lichens moss grass

### **Climax Community**

The stable community forming an ecosystem

Example Deciduous trees Oak Hickory

## **NYS Stages of Succession**

Lichens / grasses / shrubs / conifers / deciduous trees

# **Biomes**

Common types of climax ecosystems found on Earth.

Some factors that determine biome type. Latitude / altitude / rain fall / temperature

## **Terrestrial Biomes – Land**

Tundra / taiga / Deciduous forest / tropical forest / grassland / desert

## **Aquatic Biomes – water**

Marine / estuary / fresh

# Human Impact on the Environment

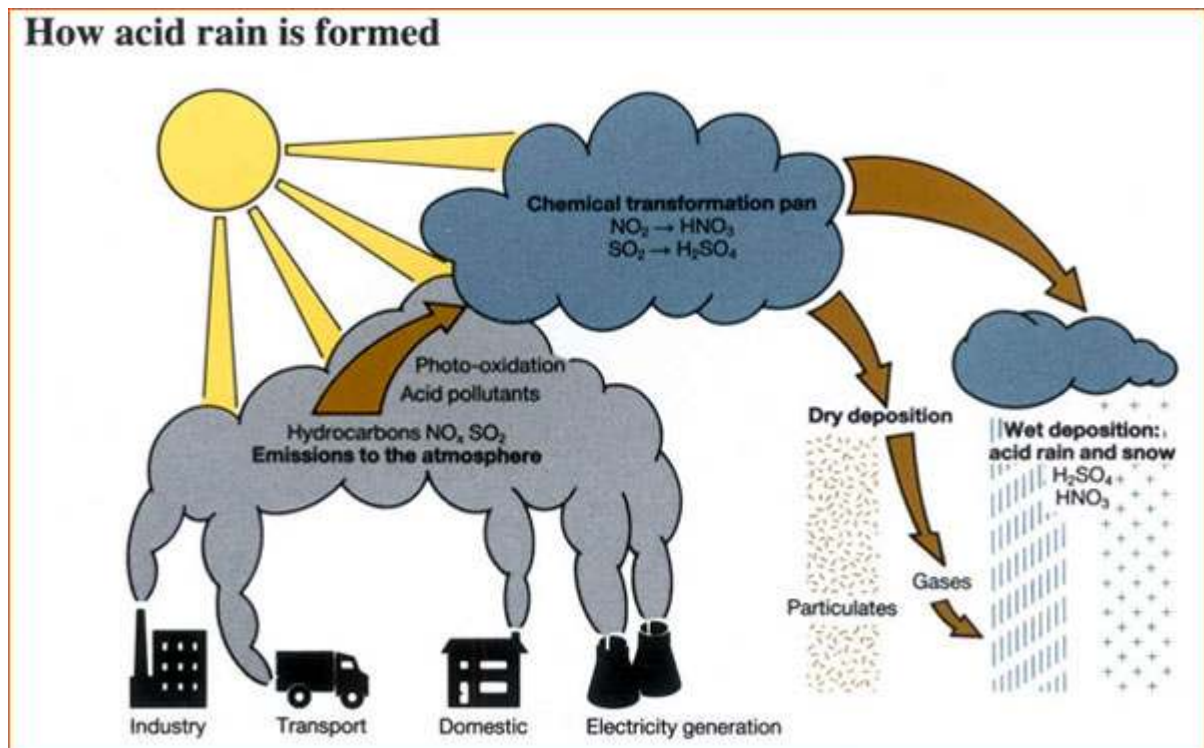
Humans have modified the environment more than any other species in history.

Effecting one part of an ecosystem may have unintended effects on another part of the ecosystem.

## Glossary of Major Environmental Problems

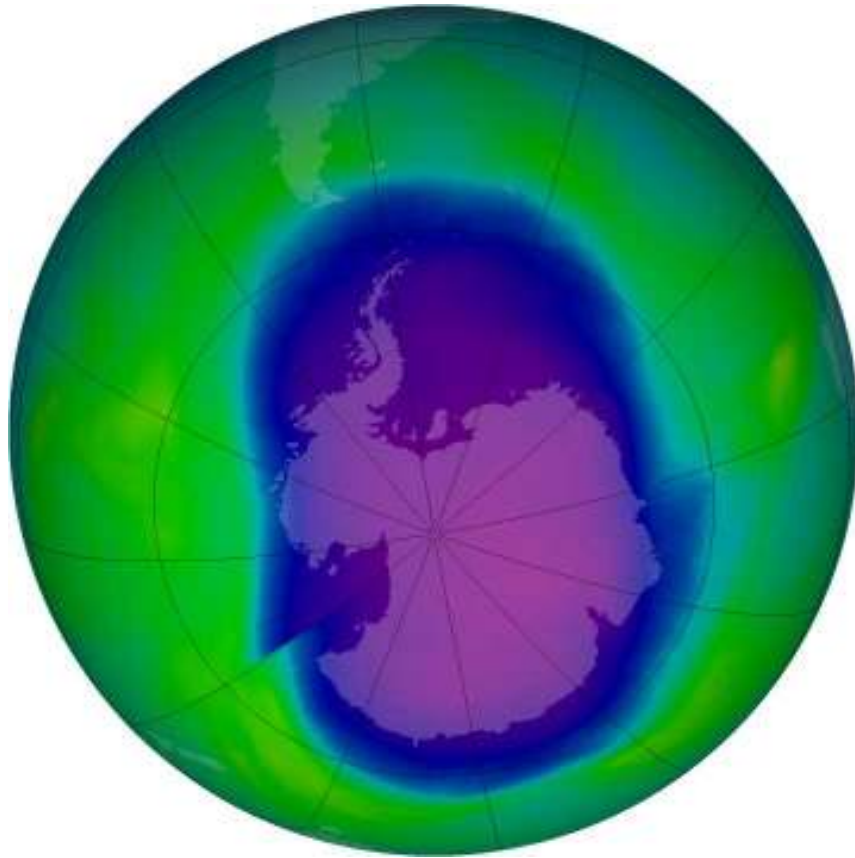
### Acid Rain

When coal is burned in a power plant small amounts of sulfur in the coal go into the air out of the smoke stack. This smoke mixes with the moisture in the air becoming sulfuric acid. The acid falls to the earth as acid rain contaminating the environment.



## Ozone Hole

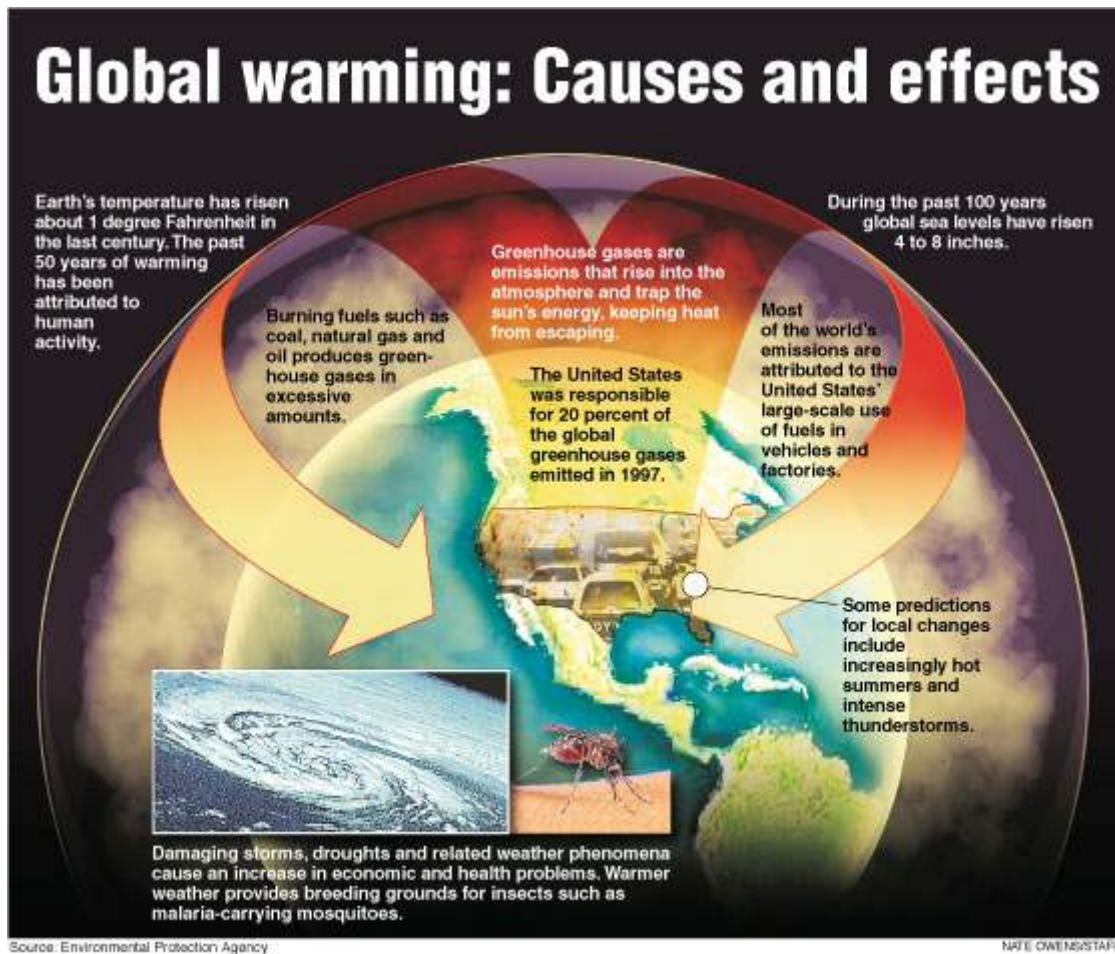
There is a layer in the upper atmosphere that protects the earth from cancer causing UV ray of the sun called the Ozone Layer. The Ozone layer has been destroyed by a chemical known as CFC that comes from aerosol spray cans and refrigerator coolant. A hole above Antarctica has formed in the ozone layer do to CFC use. CFC has now been banned and the ozone hole is getting smaller.





## Global Warming

The earth is getting warmer which causes glaciers to melt and sea levels to rise. The increase in global temperature may be caused by high levels of carbon dioxide being released into the air by burning fossil fuels. The CO<sub>2</sub> traps earth's heat that would normally be released into space.



## **Algae Blooms**

Fertilizers from farms, parks, golf courses and private lawns wash into streams, rivers, lakes and eventually the ocean and cause huge amounts of algae to grow. When the algae dies and sinks to the bottom of the water, bacteria that decomposes them suck the oxygen out of the water killing many of the fish.



## **Invasive Species**

Humans have introduced new organisms to an ecosystem. The new non-native or unnatural organism disrupts the natural environment. Zebra mussels are an example of an invasive species brought to the great lake from Asia in large cargo ships.

**Regents Living Environment Project**  
**Human Impact On The Environment**  
**How do these issues effect the environment we depend on?**  
**Topic Selections**

<b>Environmental Issues</b>
Acid Rain
Nuclear Waste Disposal
Ozone Hole
Algae blooms
Deforestation
Global Warming
MTBE fuel additive
Forest Fire Prevention
Hudson River PCB
Invasive species
Pesticides
Mercury contamination

Name: \_\_\_\_\_

Topic Selected: \_\_\_\_\_

Due Date: \_\_\_\_\_

Test on all presentations will be given

## Power Point Documentary

- Title page with picture

Cover topic thoroughly include when applicable

**How humans caused the problem**

**How the problem affects the environment**

How the problem affects Humans

How can the problem be fixed Include opposing views

- Include at least 4 graphics (1 map/ 1 graph/ 1 table/ 1 diagram)
- One comprehensive, student generated picture, indicated as such that summaries the presentation
- All slides organized/ legible / max of 100 words per slide
- All slides Appropriate Graphic/ sounds /colors
- NPR article on separate slide listed with 5 bullet facts
- Glossary of 10 scientific terms. Have terms in bold on PowerPoint
- 5 meaningful test questions with answers, which reviews the main points
- Complete project on the schools system

Store project in a folder in your proper class section