

*It's Gettin' Hot in Here!*

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*Presented by :*

***ECOSCI***

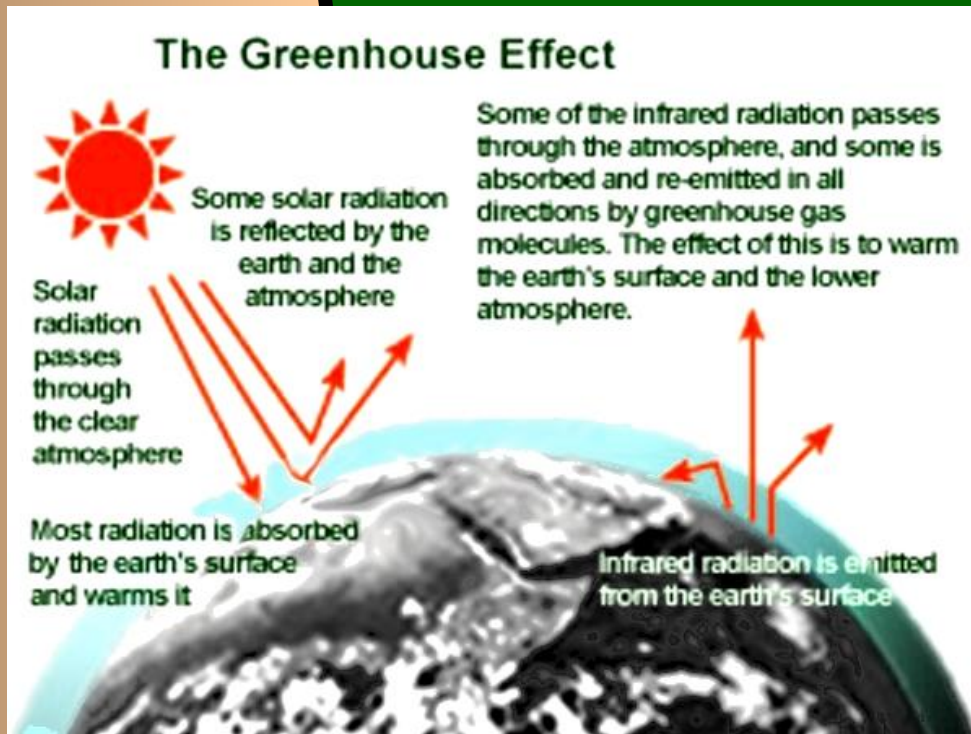
*The Academy of Mt. St. Ursula*

# *Global Warming – What is it?*

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- *Rise in earth's temperature*
- *Results from changes in the natural environment*
- *Caused by too much carbon dioxide*

# The Greenhouse Effect



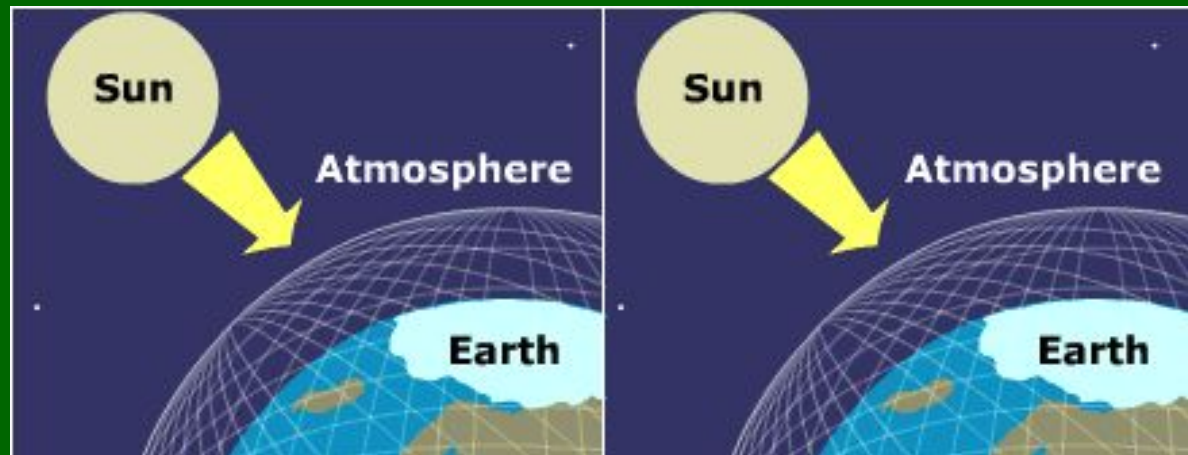
- *Solar radiation from the Sun reaches the Earth's atmosphere*
- *The surface of the Earth absorbs most of the short-rayed insolation and later releases this heat in the form of infrared radiation into the atmosphere.*
- *Some of the heat is absorbed by particles known as “greenhouse gases.”*
- *The heat retained by the gases acts as a “heat blanket.”*

# *The Greenhouse Effect*

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*Without*

*With*



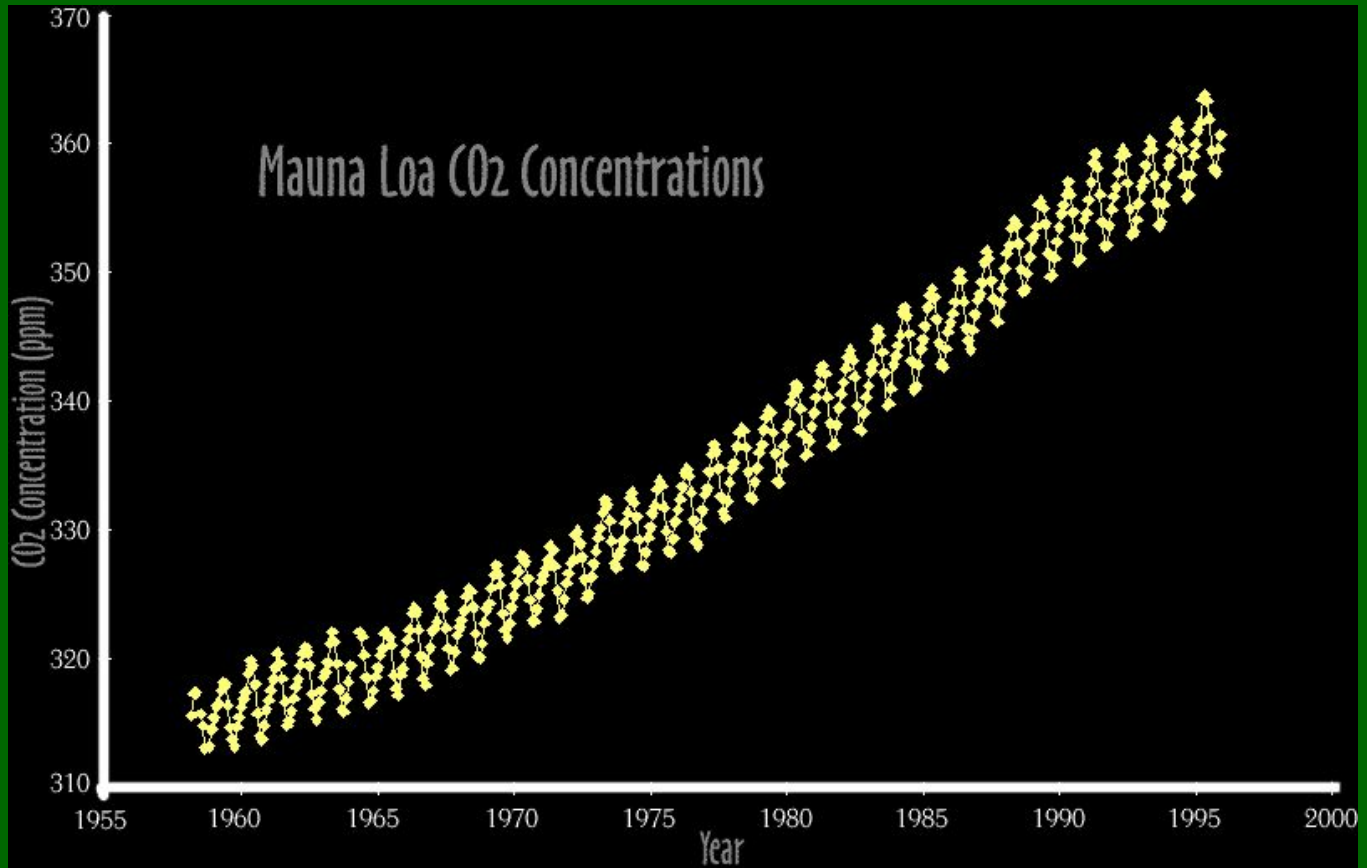


# *Burning of fossil fuels*

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- *The burning of fossil fuels releases Carbon dioxide in the atmosphere.*
- *In the past 150 years, burning fossil fuels has caused a 25 % increase in Carbon dioxide emissions.*

# *Carbon dioxide*





# *Burning of fossil fuels*

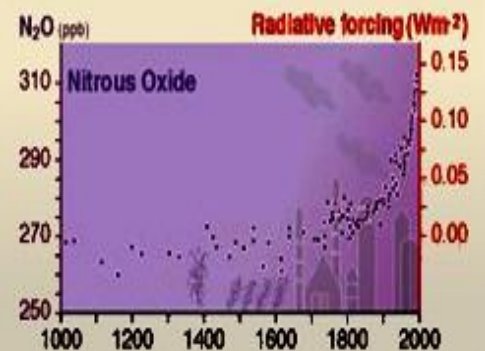
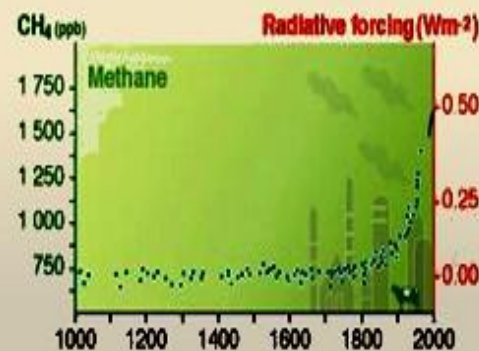
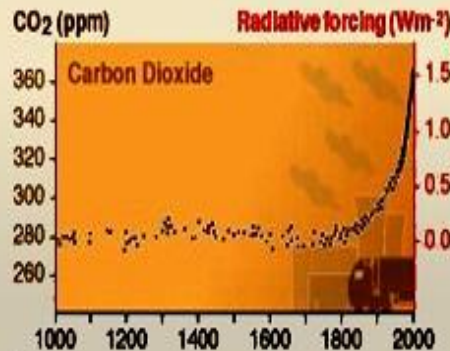
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*In the last 200 years:*

- *Nitrous oxide has increased 17%.*
- *Methane has increased 150%!!*



## Indicators of the human influence on the atmosphere during the industrial era : changing chemistry







# *The Ties Between Sardines & Global Warming*

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- *The over-hunting of sardines has caused higher levels of phytoplankton in the ocean.*
- *While living, phytoplankton release oxygen into the atmosphere and use Carbon for photosynthesis*
- *When they die, their decay releases large amounts of methane and the poisonous gas, hydrogen sulfide. It also uses large amounts of oxygen.*

# *Sardines & Global Warming*

*(Cont.)*

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- *Methane is 21 times more effective than carbon dioxide in maintaining heat in the atmosphere.*
- *This results in the deaths of numerous marine animals.*

# *Effects of global warming*

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- *More carbon dioxide -> increase in plant growth.*
- *The increase in temperature -> rise in sea level from melting glaciers and polar ice caps (adds 0.2 mm annually)*
- *Rising temperatures will also cause drier conditions in many important agricultural regions.*



# ***GLOBAL WARMING:***

## ***Sea Life***

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### **GLOBAL WARMING'S NEGATIVE IMPACT ON SEA LIFE—**

#### **Coral Reef Bleaching—**

- Change in temperature and elevated sea level cause loss of algae in the coral.
- Coral appears white, or “bleached.”
- Result is mass death of sea animals, which are dependent on the coral reef.

The penguin population near Antarctica has been declining as the distance between them and their food has increased.



# Rising Sea levels

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- *The rise of temperature, even to a few degrees, could lead to the melting of ice shelves that hold back glaciers. This results in rising sea levels*
- *The Larsen area of North Antarctic, South of Chili and Argentina have lost more than 5,200 sq miles of area.*

# *The Effects of Global Warming on Land animals*

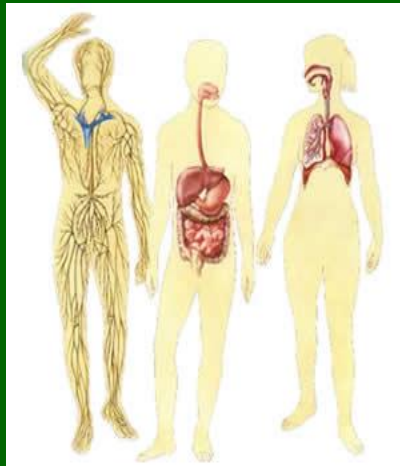
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- *Global warming can disrupt the migration, hibernation and reproductive cycles of certain types of animals.*
- *Plants and animals will find it hard to escape or adjust to the effects of warming because humans occupy so much land.*
- *Farmland or cities interrupt the movement of species between habitats.*

# Health & Global Warming

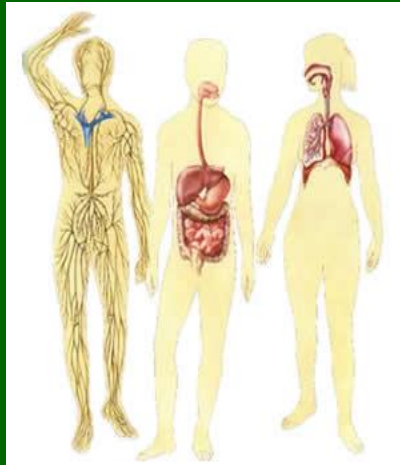
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- *Extreme temperatures can directly cause the loss of life (ex: 35,000 people died during heat wave in Europe, Aug '03.)*
- *Warmer weather provides an ideal breeding environment for mosquitoes. Diseases such as West Nile will be more common.*

# *Health & Global Warming (cont.)*

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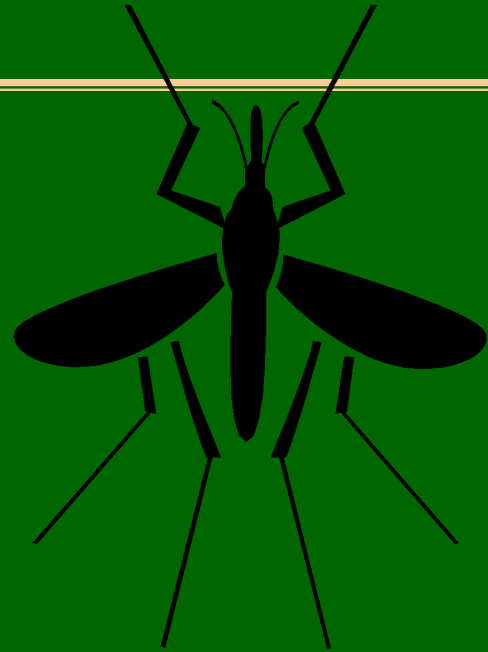
- *High temperature can increase pollution of water and air, which harms the human body.*



# *Tropical Diseases*

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- *Global Warming increases drought which lessens the supply of clean drinking water.*
  - *Cholera*
- *It increases temperature providing an ideal breeding environment for mosquitoes.*
  - *Dengue fever*
  - *Malaria*
  - *Yellow fever*



# IMPACT ON AIR

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*The atmosphere's ultimate fate is unclear.*

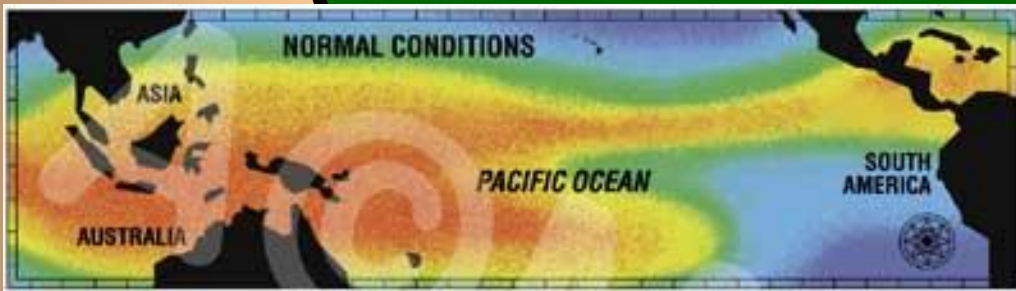
*More evaporation □ increase in cloud cover*

*How High Will the Clouds Be? It makes a difference!*

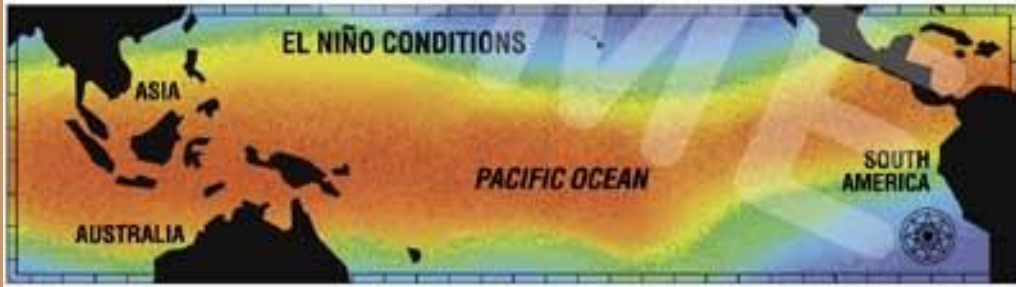
- *Clouds close to the earth reflect sunlight □ cooling effect.*
- *Clouds high in the atmosphere trap heat □ warming effect.*

*Generally:*

- *Cloud cover increases*
- *Levels of the greenhouse gas methane may increase*
- *Hurricanes range farther north, south on warmer water*



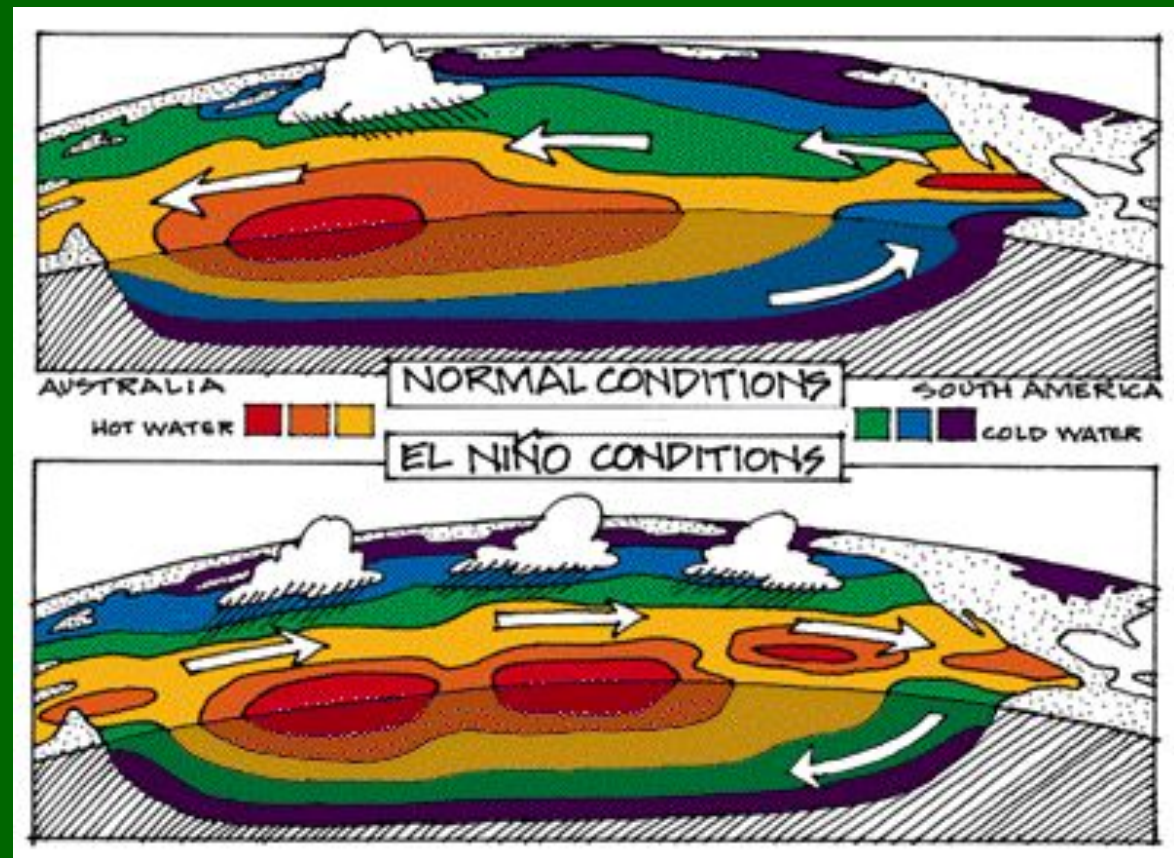
# *El Niño Effect*



- *Severe oceanic/atmospheric disturbance, every 7-14 yrs (“the child”)*
- *Warm surface waters suppress cold, nutrient-rich upwelling of the Humboldt Current*
- *Fall in the number of plankton*
  - *Wreaks havoc upon the entire ocean food chain*
  - *Devastates the fishing industry*

# El Niño Effect

- **Complete reversal of the trade winds:** torrential rain, flooding, and mudslides to the usually dry coastal areas of Peru and Ecuador.



# *El Niño Effect*

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- ***Collapse of the monsoons*** in Asia □ severe drought to Indonesia and northern Australia.
- ***Severe weather disturbances*** in other parts of the world, such as droughts in areas of Africa and central North America.

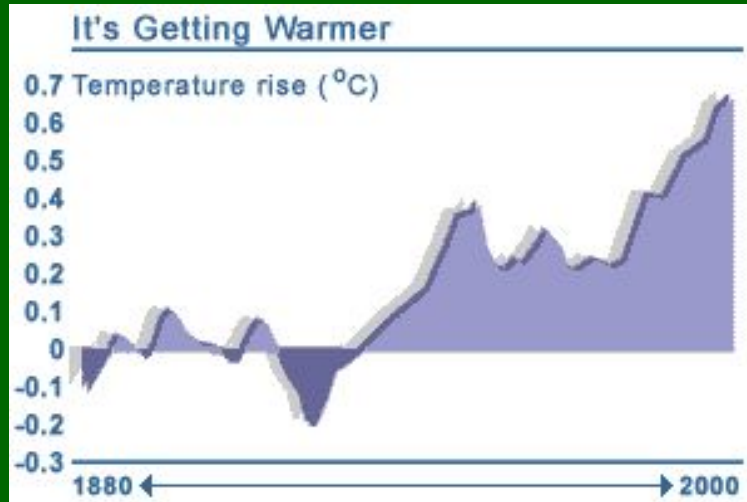
# *Kyoto Protocol*

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- The Kyoto Protocol is an amendment to the United Nations Framework Convention on Climate Change (UNFCCC)
- UNFCCC, an international treaty on global warming
- Countries which ratify this protocol commit to reduce their emissions of carbon dioxide and five other greenhouse gases
- A total of 141 countries have ratified the agreement. Notable exceptions include the United States and Australia

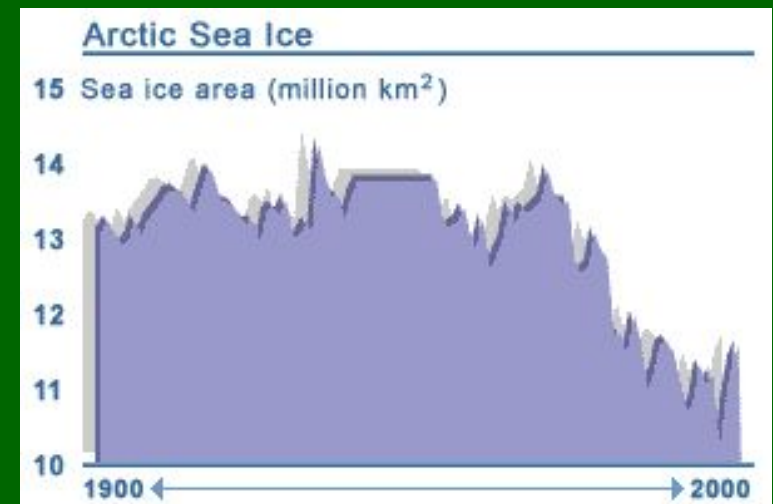
# Kyoto Protocol

It's Getting Warmer!



□ Temperature

Area of Ice →



# Continued..

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- It was negotiated in Kyoto, Japan in December 1997, opened for signature on March 16, 1998, and closed on March 15, 1999
- Current estimates are that even if successfully and completely implemented, the Kyoto Protocol is predicted to reduce the average global temperature by somewhere between  $0.02^{\circ}\text{C}$  and  $0.28^{\circ}\text{C}$  by the year 2050



# *UN Framework On Climate Change*

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- Article 2 (iv) Research on, and promotion, development and **increased use of, new and renewable forms of energy, of carbon dioxide sequestration** technologies and of advanced and innovative environmentally sound technologies
- (vi) Encouragement of appropriate reforms in relevant sectors aimed at promoting policies and measures which **limit or reduce emissions of greenhouse gases** not controlled by the Montreal Protocol;
- (viii) Limitation and/or **reduction of methane** emissions through recovery and use in waste management, as well as in the production, transport and distribution of energy



# *The Climate Stewardship Act*

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- *First introduced in the senate in 2003 and reintroduced in February 2005*
- *It would reduce carbon dioxide, methane, nitrous oxide, hydroflurocarbon and perfluorocarbons which are released by power plants to 2000 levels by 2010.*
- *The bill reduces the risk of global warming without hurting the economy.*



# How To Prevent Global Warming:

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❖ *Plant trees*

❖ *Conserve energy:*

*(examples: 1. use low-energy, low-water-use washing machines, 2. use a solar heated system for hot water, 3. use an electric or push mower for gasoline powered mower)*

❖ *Buy energy efficient products*

❖ *Buy products that have reusable or recyclable packaging*

❖ *Reduce use of car (walk instead)*

# 3R's

of Saving Mother Nature

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Reduce,

Reuse,

Recycle!