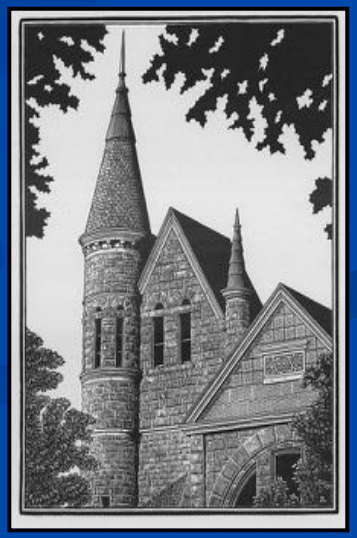
Oberlin College: Green Energy and Environmental Justice

John Petersen, OC '88

- What is environmental justice?
- Climate change as an issue of justice
- Green energy at OC
- Other environmental developments at OC



Earth in daylight

10^6 km

Earth at night

Earth at night

Environmental Justice:

- Distribution of power and environmental benefits and burdens among different groups of people
  1. Distributive justice
  2. Participatory justice

Distributive justice:

- How are benefits and burdens distributed?
  - Among groups
  - Across regions
  - Across generations

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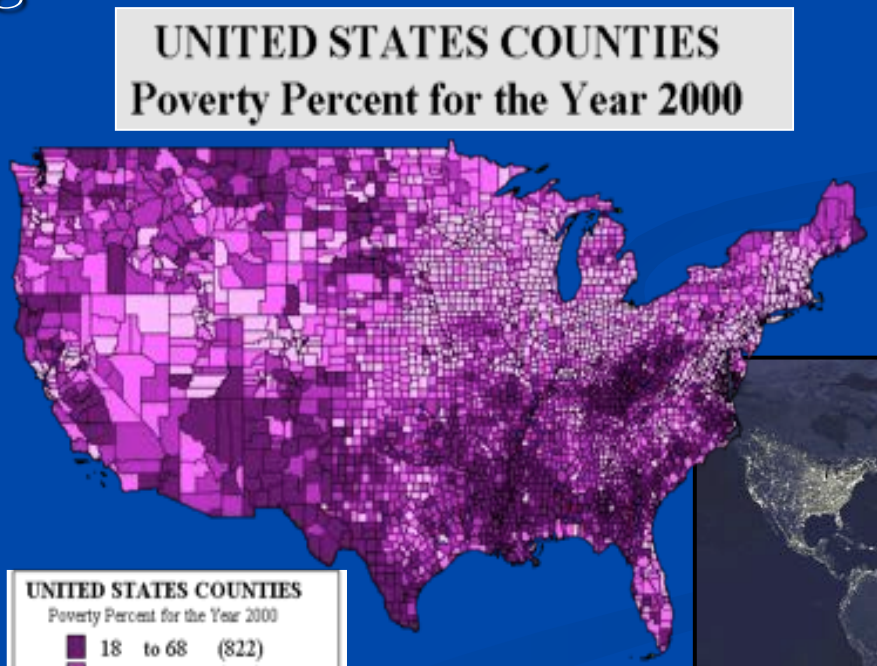


Distributive justice:

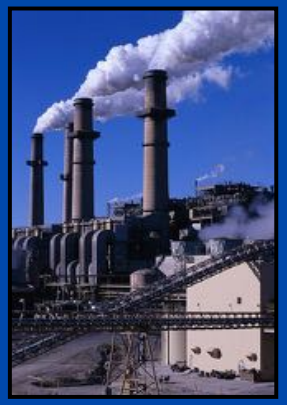
- How are benefits and burdens distributed?
  - Among groups
  - Across regions
  - Across generations

Participatory justice:

- Who participates in decision making?



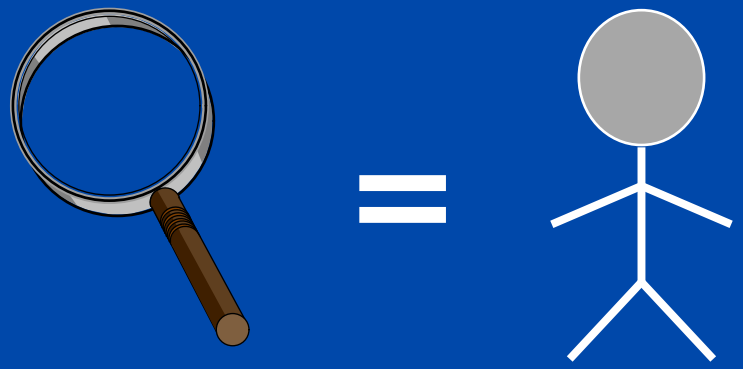






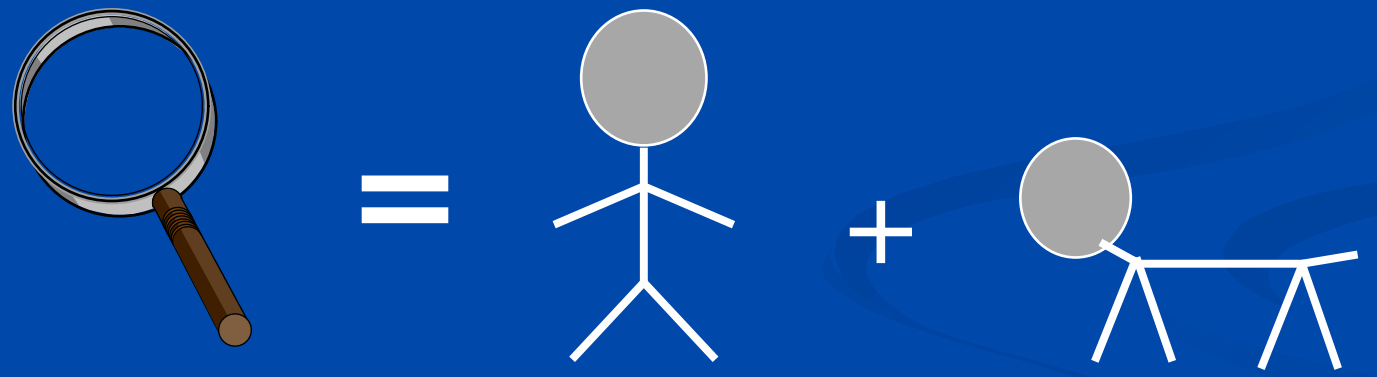

Contrasting ethical systems

1. Ethical humanism (traditional Western ethics)



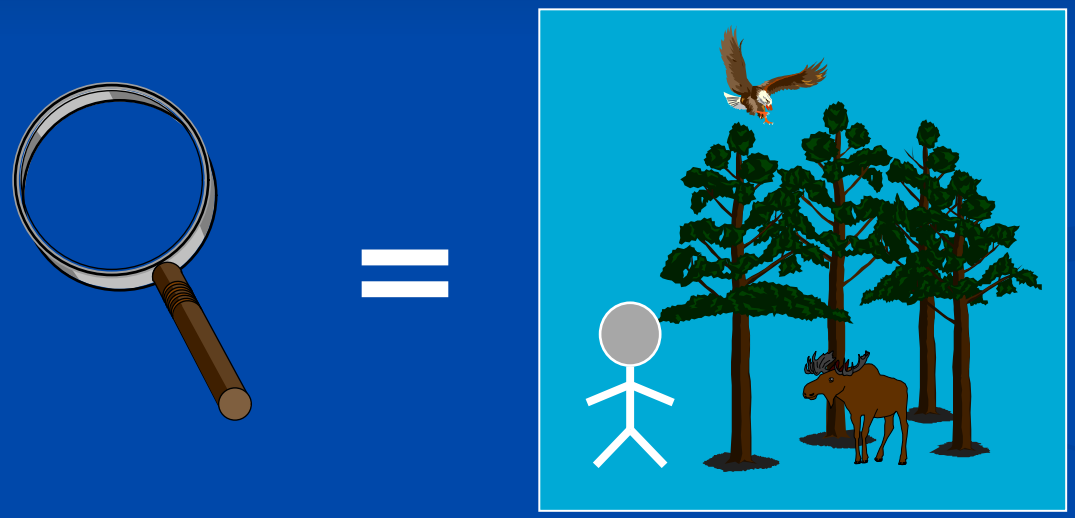
Contrasting ethical systems

1. Ethical humanism (traditional Western ethics)
2. Humane moralism



Contrasting ethical systems

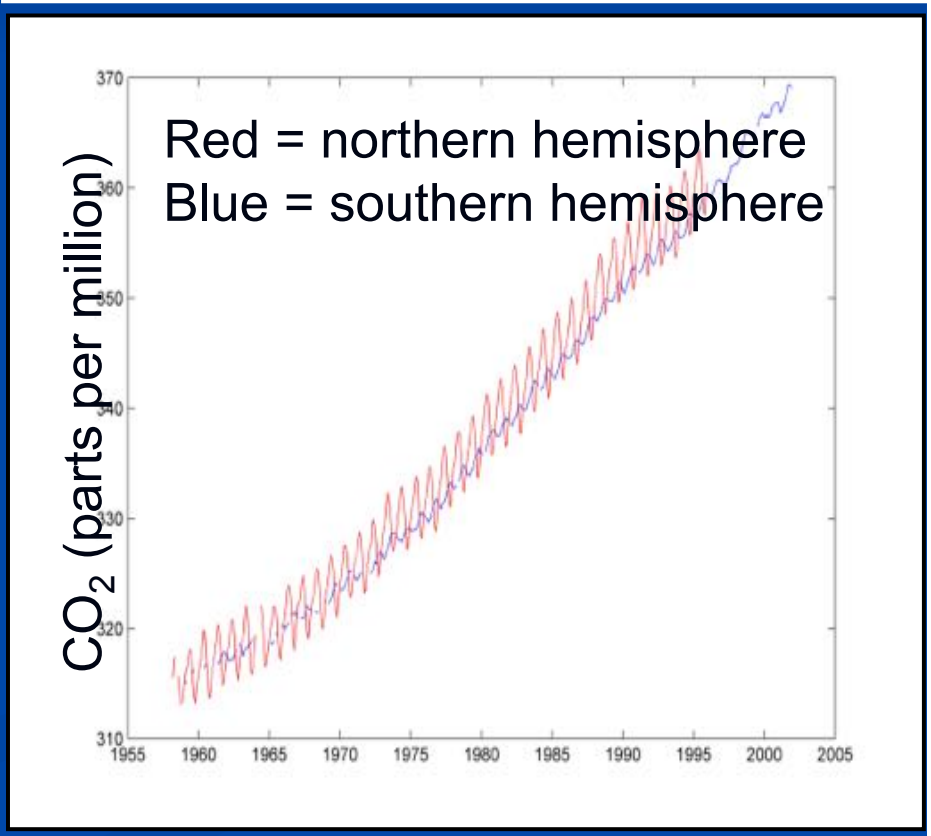
1. Ethical humanism (traditional Western ethics)
2. Humane moralism
3. "Land ethic" (Aldo Leopold)



"A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise."

What we know about climate change

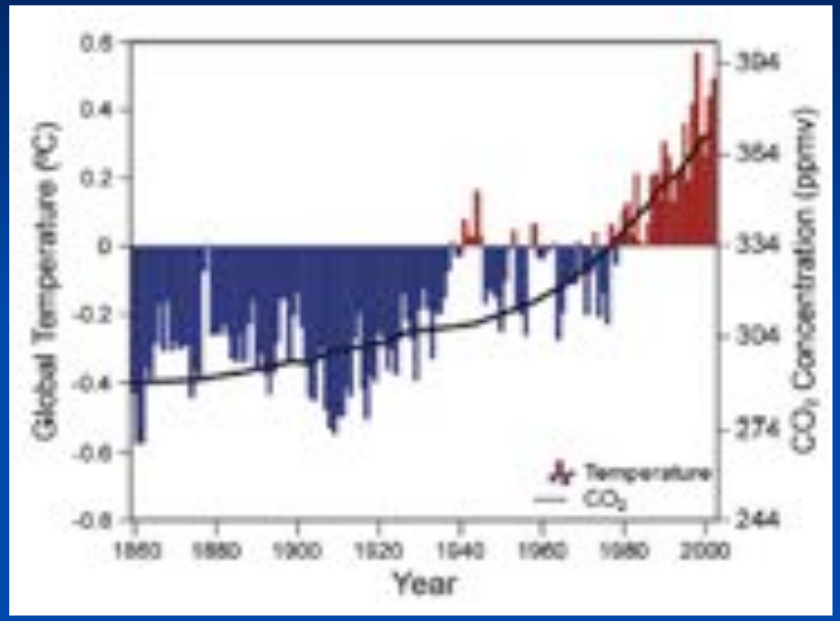
- The scientific consensus
  - It is real
  - Humans are responsible
  - It will accelerate
  - It already effects people and ecosystems



Climate change is unequal in extent

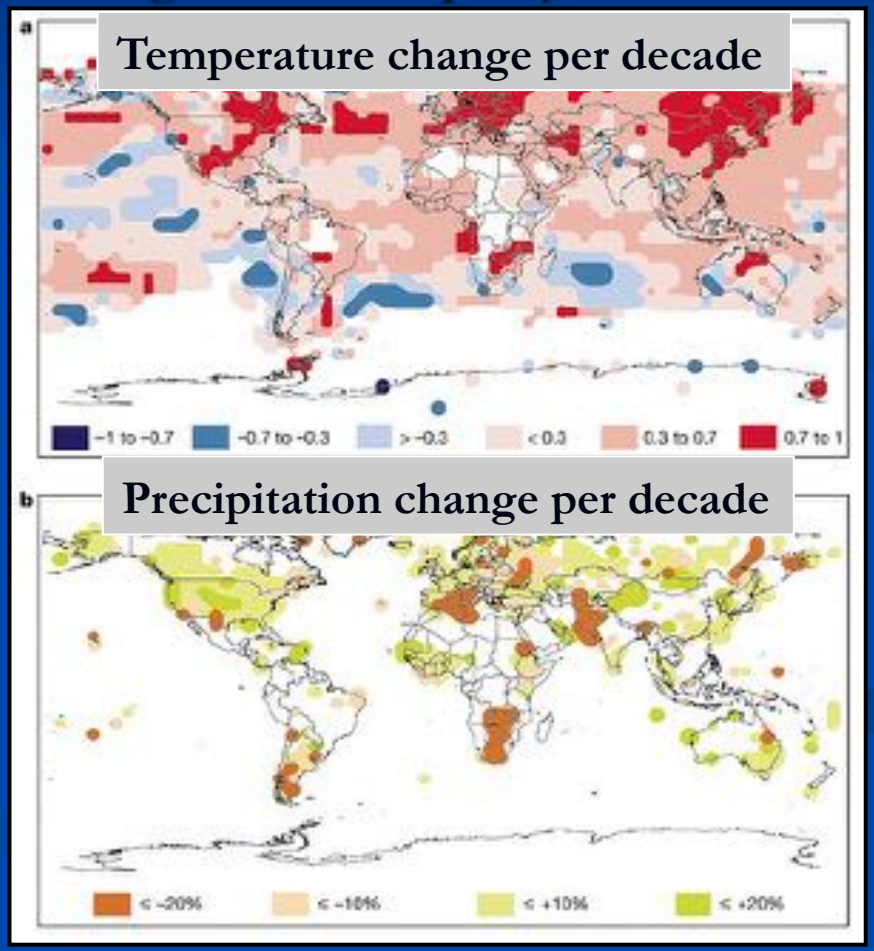
Increases in average temperature

Average Temperature



(Karl and Trenberth. 2003. Nature)

Changes are unequally distributed



(Walther et al. 2002. Nature)

Melting glaciers

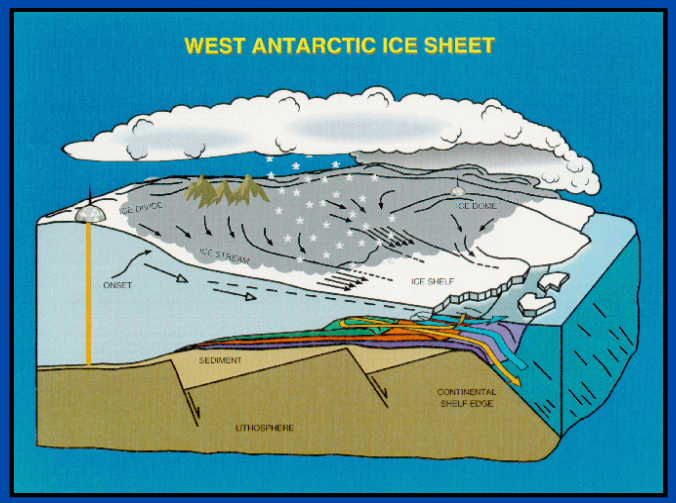
- Kilimanjaro

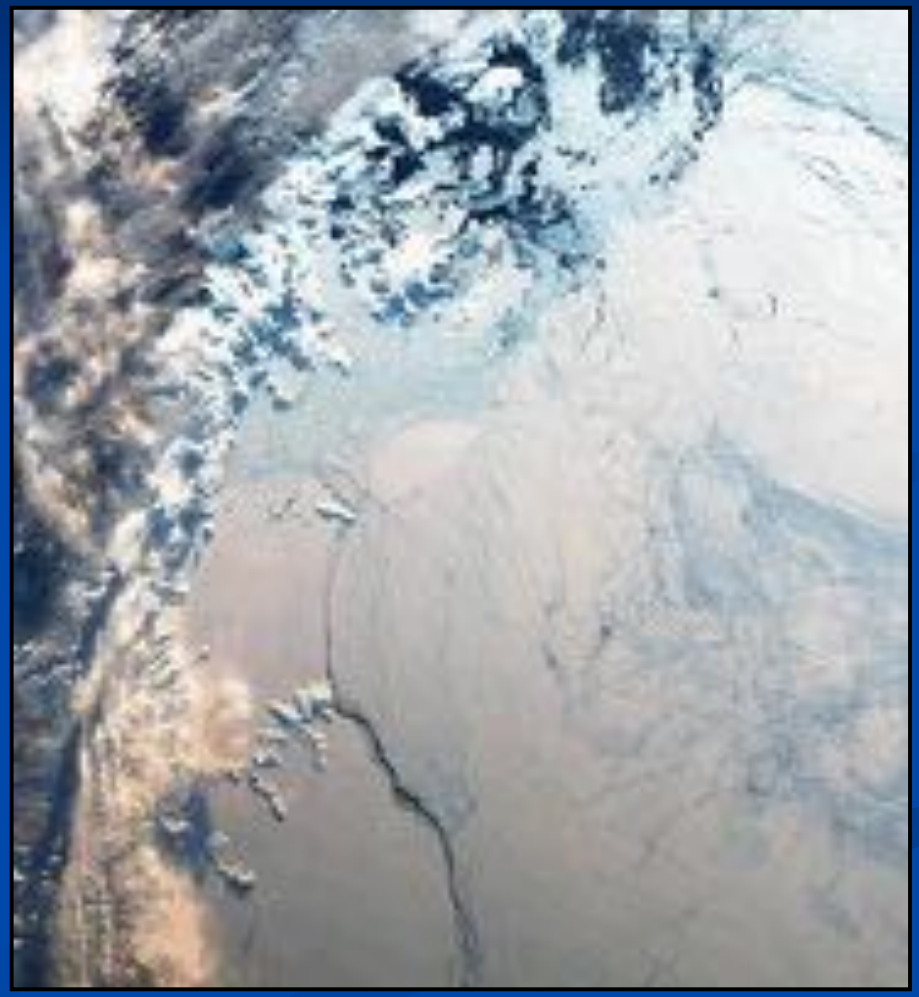
- Qori Kalis Glacier (Peru)

(Source: Lonnie Thompson, OSU)

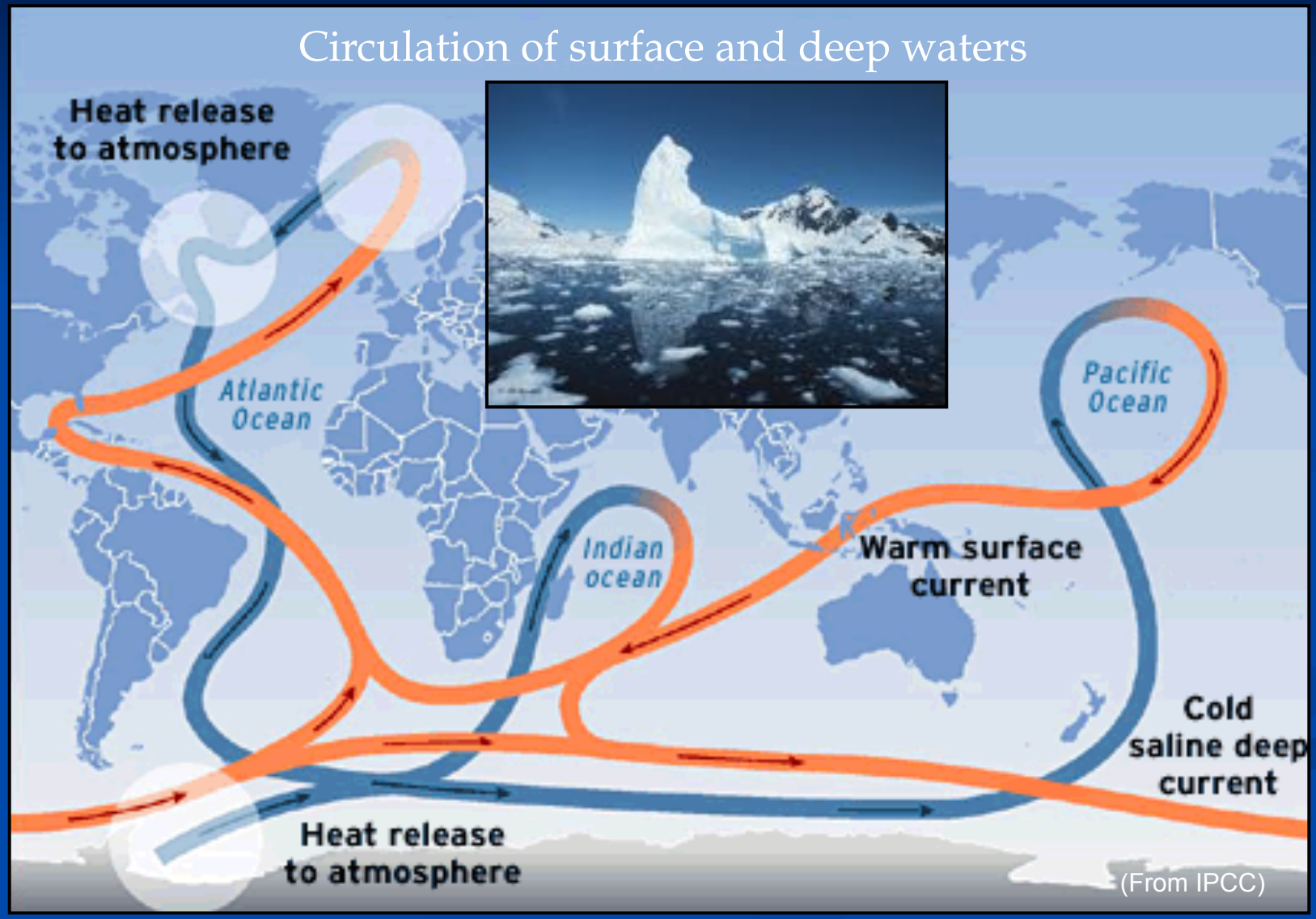
Melting of Arctic and Antarctic ice

- The West Antarctic ice sheet



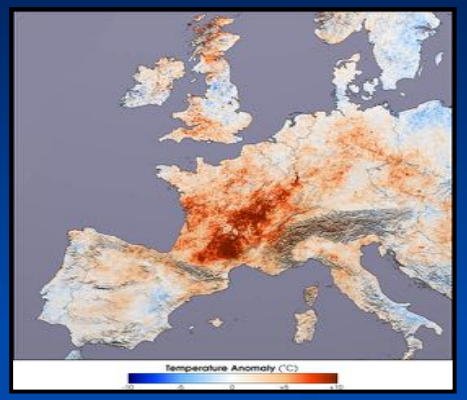


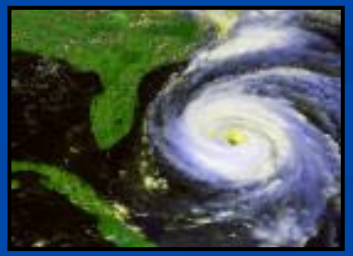
Changing thermohaline circulation



Effects of extreme climate on humans

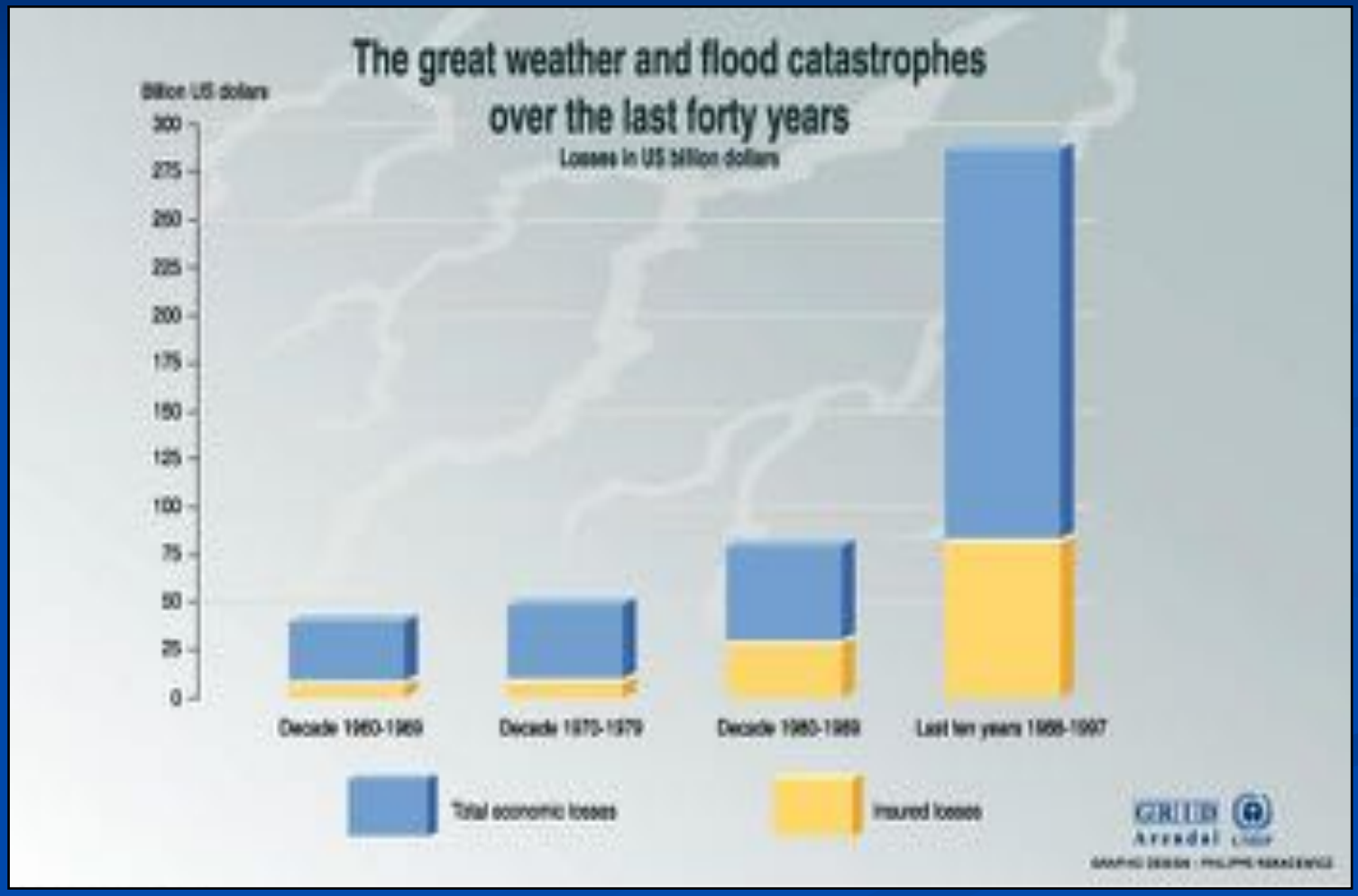
- European heat wave summer '03:
  - 35,000 heat related deaths
  - 13% drop in European grain harvest
- South Asian floods and landslides '03:
  - 1,000 summer deaths from floods & landslides
- Brazil floods'03:
  - 119 dead, 180,000 lost homes
- California wildfires '03:
  - Destroy 750,000 acres, 3,500 homes
- Northern India extreme cold '03:
  - 189 deaths in December





Increased payout for weather events

- 2004 Total global insured losses = $44 billion
- 2004 $40 billion for hurricanes in U.S./Caribbean and typhoons in Japan



Climate refugees

- Shishmaref Alaska

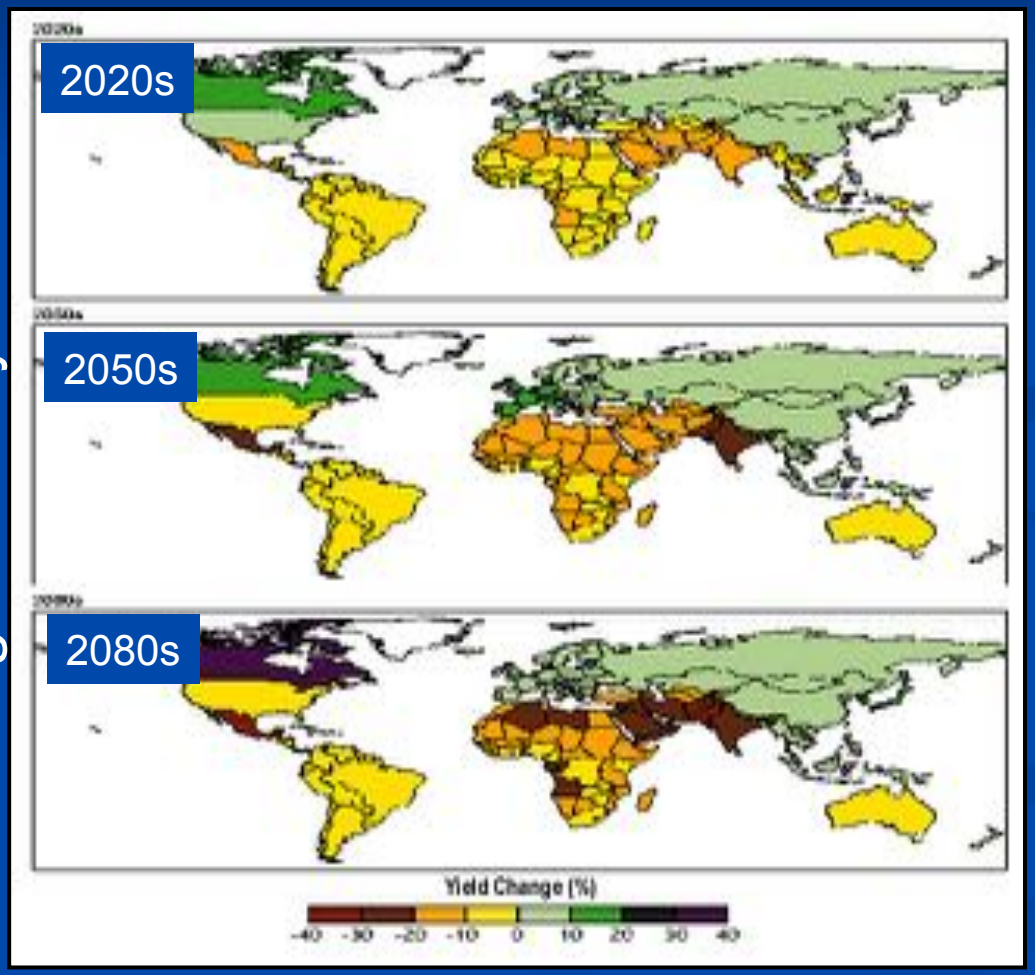
- Island and low-lying countries
  - Tavalu, Maldives, Bangladesh

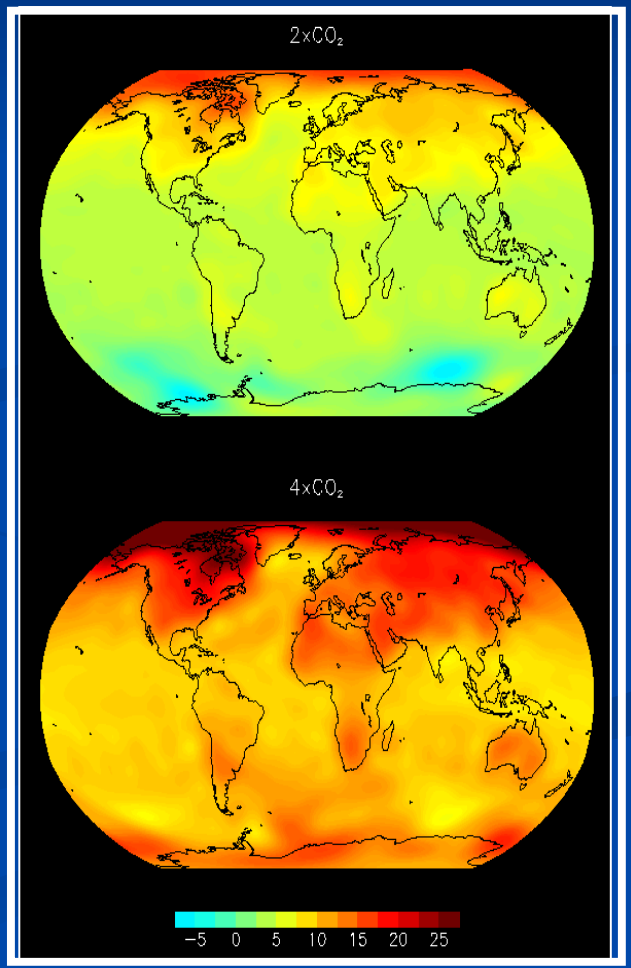
- Low-lying cities
  - New York, London, Tokyo, Bombay, Calcutta

Change in agroecosystems

- 50% expansion in food production necessary in next 30 years to keep up with additional 3 billion people
- Tropical regions loose productivity under *all* warming scenarios

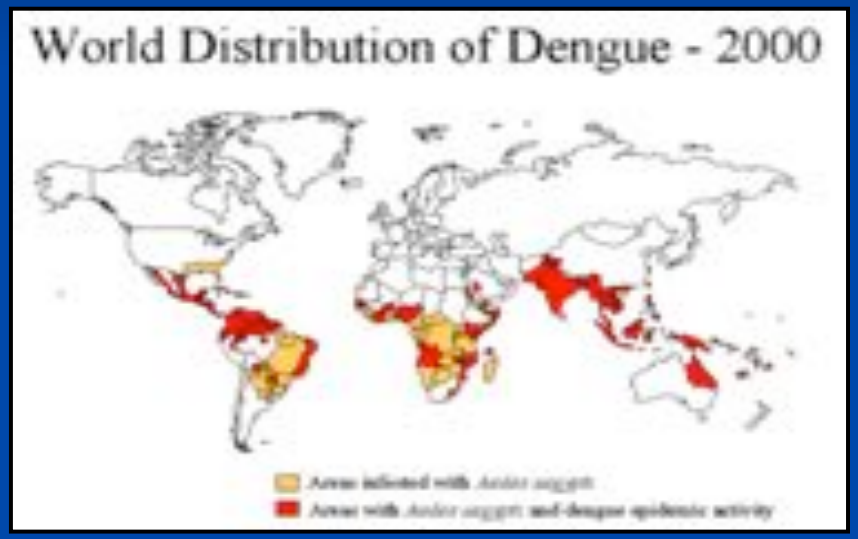
Predicted changes in agricultural yield

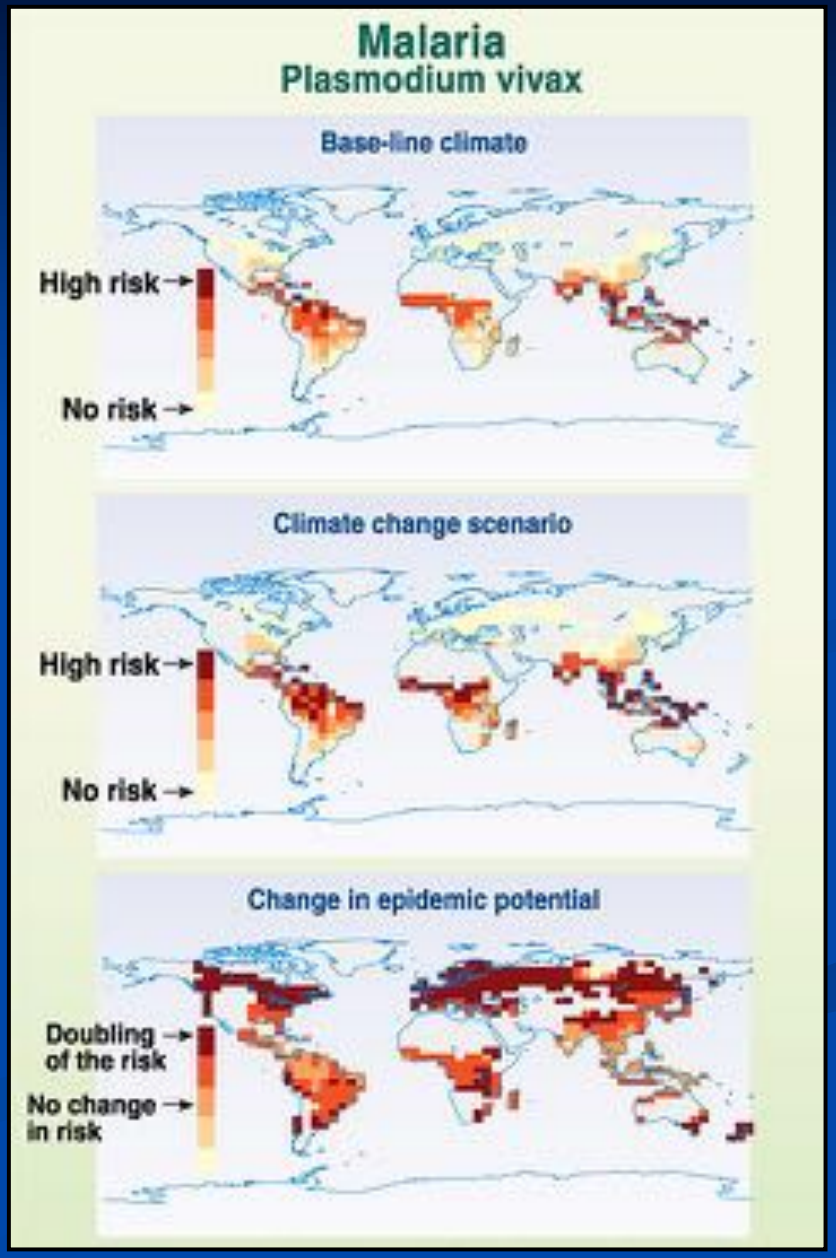




Human health effects

- Food
- Water
- Disease
  - e.g. Malaria & Dengue

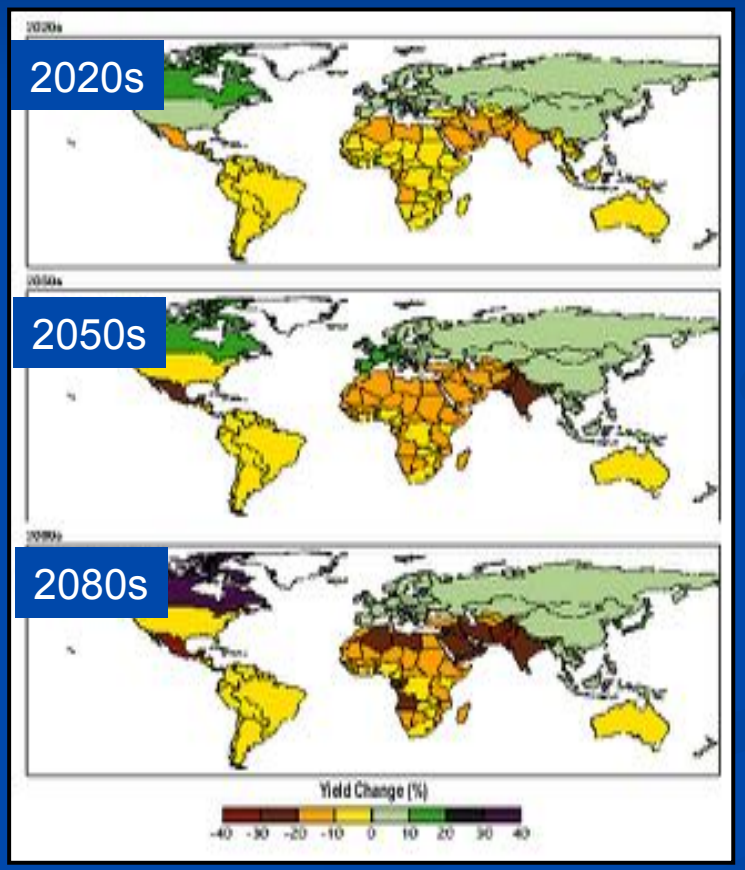




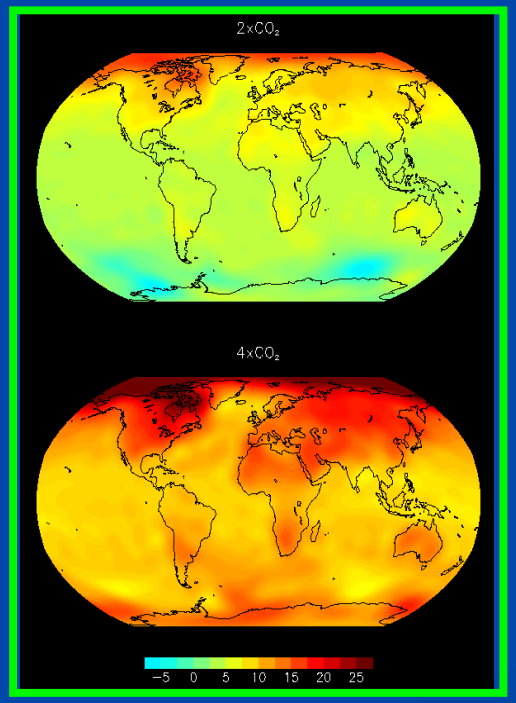
Climate change & ecological justice

- USA: 6% of population → 23% of CO_2
- Richest 20% of global population → 53% of CO_2
- Early effects disproportionately born by poor nations

Predicted changes in agricultural yield

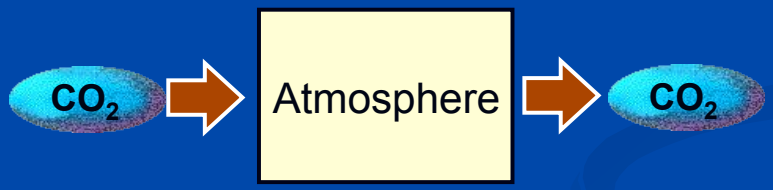


Everything worth caring about is affected by climate change!



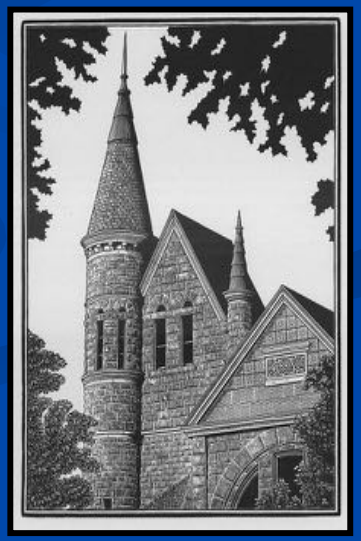
Options for managing climate change

- Adaptation
- Mitigation
  - *Decrease Input of CO_2 to atmosphere*
  - *Increase Output of CO_2 from atmosphere*



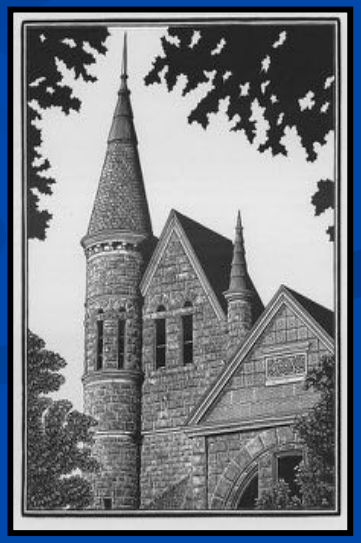
Oberlin College: 0→60 on Green Electricity

- Synopsis
- Environmental impact of electricity use
- What is "green" electricity?
- What does green energy do for the College?
- How will we pay for it?
- What are the potential benefits?



Synopsis

- In 2004, Oberlin College signed an agreement with Oberlin Municipal Light and Power Systems to purchase 13,000 megaWatt-hours/yr of "green" electricity.
- This agreement resulted in:
  - 60% green electricity
  - 25% reduction in greenhouse gas emissions
  - "Sustainable Energy Reserve Fund" for the town

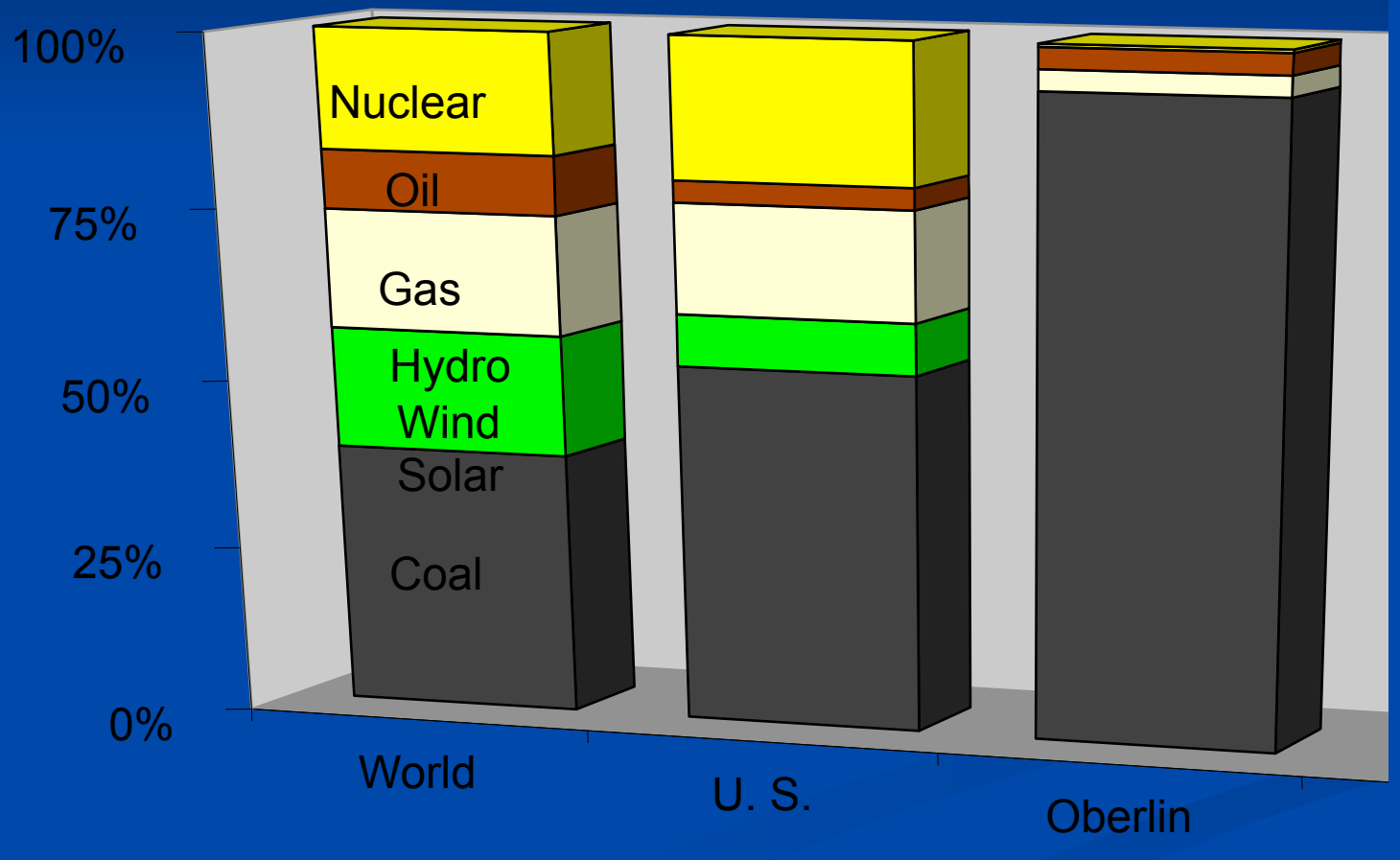


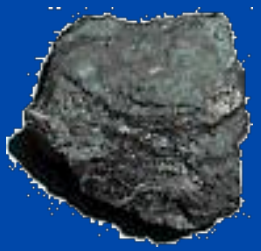
Environmental impact of electricity

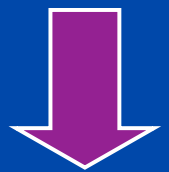
- Different regions use different mixes of resources to produce electricity

Environmental impact of electricity

- Oberlin is in "Coal country"





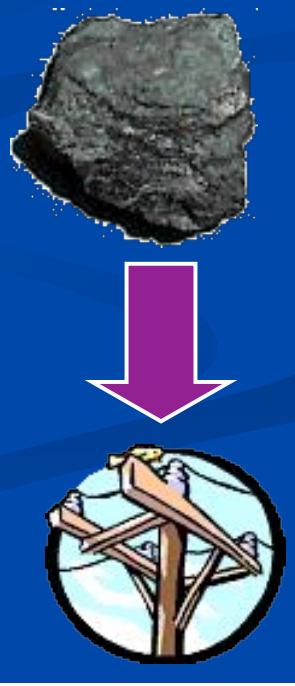


Environmental impact of electricity

- Coal is one of the most polluting sources of electricity
  - CO_2 → Climate change
  - SO_2, NO_x → Acid rain, smog
  - Mercury, Particulates → Human health

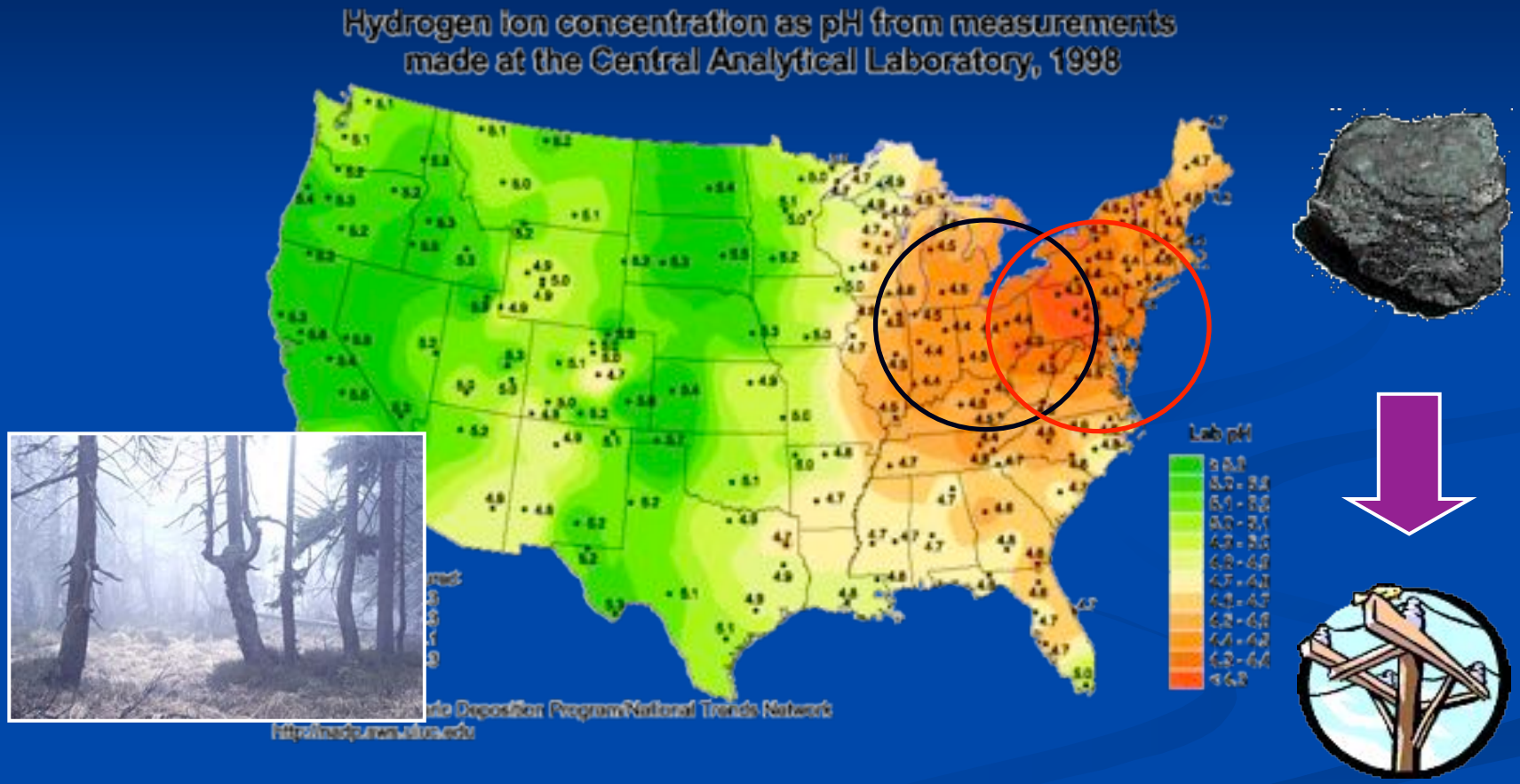
Environmental impact of electricity

- Oberlin College consumes 20,000 MWh/yr
- Emissions intensities for Oberlin mix
  - CO_2 (1 ton/MWh)
  - SO_2 (7.6 lbs/MWh)
  - NO_x (20 lbs/MWh)



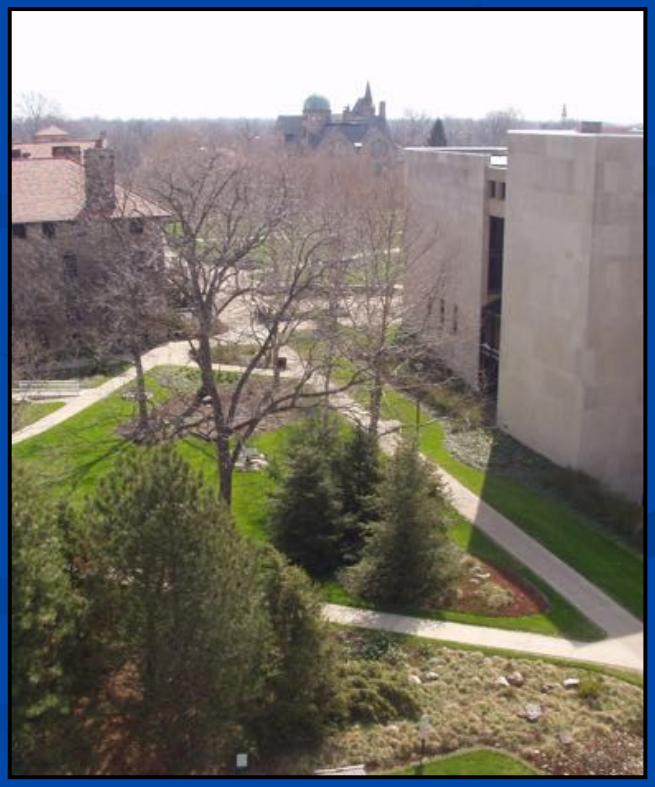
Environmental impact of electricity

- Acid rain



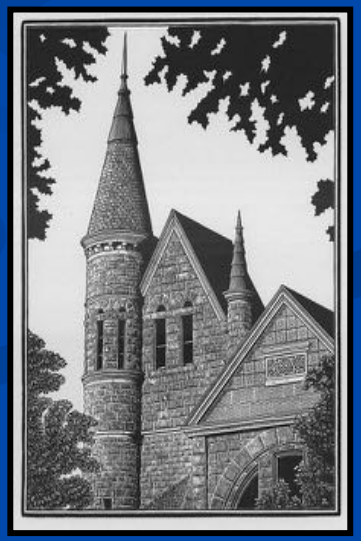
Greenhouse gas budget for Oberlin College prior to agreement

- Rocky Mountain Institute "2020" Report
  (in thousands tons of CO_2/yr)
  - Electricity = 24
  - Coal = 15
  - Natural gas = 5
  - Transportation = 3
  - Refrigerants = 3
- Total = 50,400 tons/yr
  - = 18 tons/student
- 41% is from electricity



The point:

- Magnitude of energy use on campus has consequences
- Source of electrical energy has consequences
- Choices exist for reducing impact

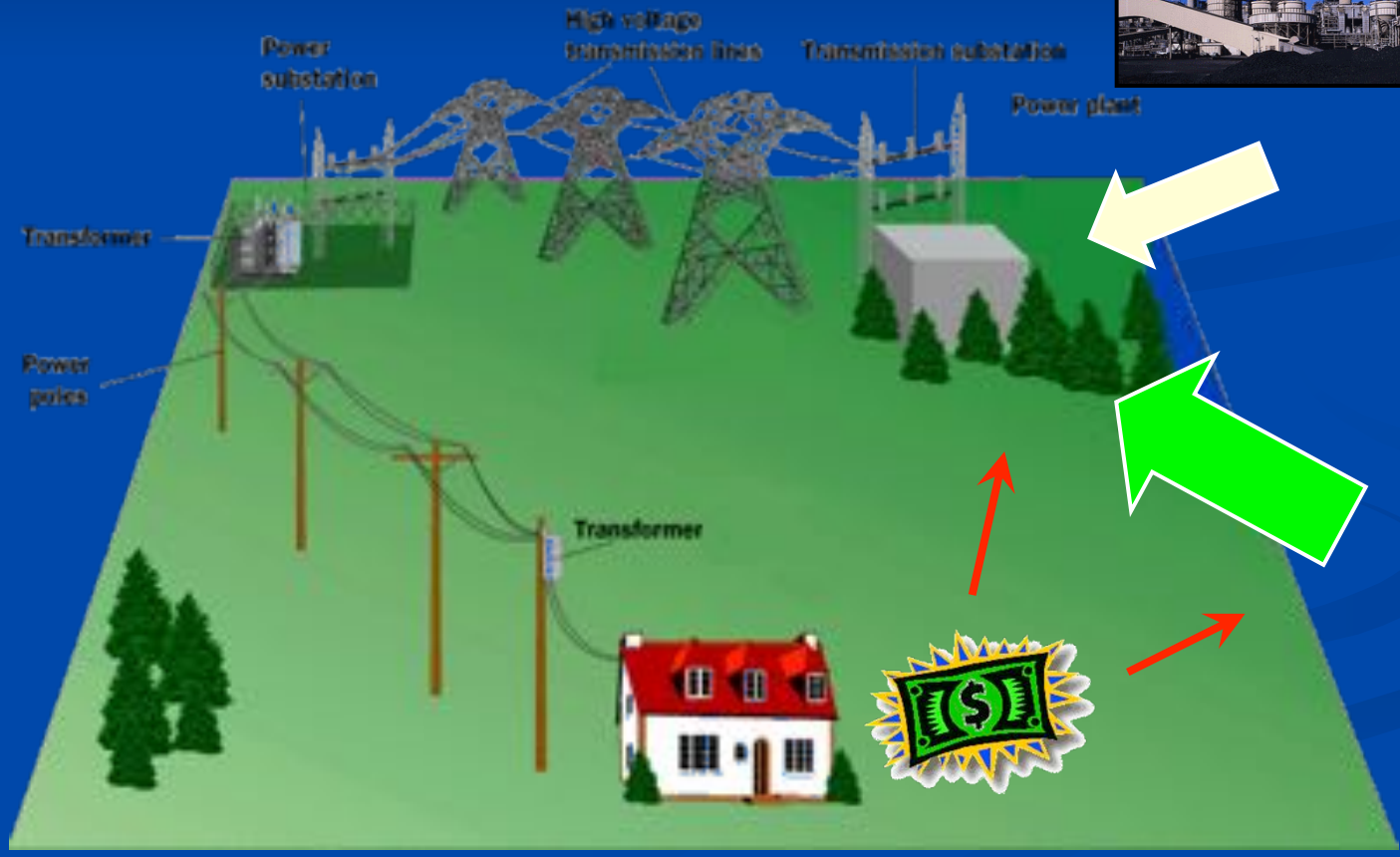


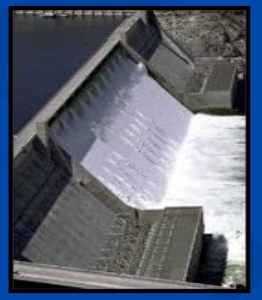
What is "green" electricity?

- Electricity generated in ways that minimize environmental impacts
  - Renewable energy
  - "Salvaged" energy

How does green energy get bought and sold?

- The "grid"





What does our purchase do for Oberlin's emissions?

- 13,000 MWh/yr of green power displaces the pollution of coal

	CO_2	SO_2	NO_x
Total pollution averted per year	12,600 tons	100 tons	40 tons
Pollution averted per OC ***student***	4.5 tons	90 lbs	30 lbs
%Pollution reduction in electricity	63%		
%Pollution reduction in total energy consumed by OC	25%		

What is the price tag?
How will it be paid?

- Total energy expenditures for OC
  = $ 2.4 million/yr
- Total cost of green power
  = $26,000 (1%)
- Financed through energy conservation
  - 1% cost savings → 25% CO_2 reductions

What happens to the money paid for green energy?

- "Sustainable Energy Reserve Fund" to promote:
  - Energy conservation
  - Renewable energy promotion
  - Carbon sequestration

Benefits to Oberlin College and Community:

1. Purchase reduces OC's contribution to pollution & promotes market for green energy
2. Energy conservation used to finance reduces OC's pollution
3. Sustainable Energy Reserve Fund reduces pollution in town & benefits local economy
4. Local solution serves as a national model?

Environmental developments

- Trustees adopt policy
  - Energy, buildings, land, transportation, materials
- Formation of "EPIG"
  - Petition, transportation, education, project binder
- Campus sustainability coordinator position
- Environmental sustainability incorporated into long range, "strategic plan"

Building on a tradition of moral courage and leadership

- 1835 Oberlin is first college to admit blacks
- 1838 Oberlin is first college to admit women
- 1999 Athletic apparel policy

"Probably the strongest anti-sweatshop agreement of any college or university in the United States."
John Sweeney, president AFL-CIO

- 2005 Environmental policy?