Lecture 18  
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# Climate change

# Generating understanding: from ignorance to knowledge

## Evidence that climate change is a hard problem

### Magnitude: impacts of inaction and costs of action are large

### Trends and timelines: population and affluence (IPAT) growing by 1.8% and 1.3% per year, technology declining by 0.7% per year

### Responsible behaviors: numerous and deeply embedded in all aspects of life

### Alternatives: not available or economically unattractive

### Evidence that its hard: 30 years of knowledge, 20 years of policy, yet little progress

## Basic science

### Climate vs .weather

#### Climate is long term trends and conditions

#### Weather is short term changes

### Gases causing the problem and their sources

#### 75% of problem: Carbon Dioxide (CO2): Fossil fuel use for transport, electricity, heating, cooling, manufacturing; Deforestation

#### 15% of problem: Methane (CH4): Livestock and manure; Rice cultivation

#### 8% of problem: Nitrous Oxide (N2O): Agriculture fertilization

### How those gases cause global warming

#### Many causes of greenhouse effect but few non-human causes of increase in greenhouse effect

#### CO2 and CH4 are VERY small fraction of atmosphere N2: 78%; O2: 21%; Ar: 1%; CO2: 0.04%; CH4: 0.0002%

#### BUT atmosphere is in equilibrium

#### Allow short wavelength light through but block long wavelength light and re-reflect it

### How do we know humans are the cause?

#### Correlation of temperature with human activities

#### Computer models only match observations of temperature when BOTH natural and human forcings are included.

## Why should we trust the science? Isn’t it just an opinion? The differences between knowledge, opinion, and faith. Trust the “preponderance of skeptically-evaluated evidence” not the consensus

### Credible sources: expertise and trustworthiness

### Individuals using scientific method

### Sociology of science and peer review; institutionally conservative IPCC

### Confirmation of predictions from theory

### Multiple independent sources of same info

### Multiple indicators of same trend

### Best explanation, not just a possible explanation

### Accounting for all data, not just selected data

## Impacts of climate change: Why it’s better referred to as “Climate change” vs. “global warming” -- better yet, “human-caused climate variation”

### Temperature: most areas warmer; some colder; many different

### Precipitation: some areas more; some less; some different

### Sea level rise and wave heights

### More extreme weather: drought, floods, hurricanes

### Economic losses

### Species loss

### Disease “vectors”

### Some abrupt changes or “surprises”

# Generating concern: from knowledge to negotiation (“getting to the table”)

## When do politicians listen to “science” and “scientists”? When the science is “SCL”

### Salient – relevant to the policy-makers current or near-term decisions

### Credible – generated by people who have the appropriate:

#### Expertise – do they have the training to “know the scientific truth” (or, put more accurately, “have a better sense of the truth”) than others?

#### Trustworthiness – will they report what they know accurately?

##### Are they funded by actors with vested interests in the policy outcomes?

##### Have they followed the standard “scientific method” and the social process of peer review that lead to the rejection of views that cannot withstand criticism from others with expertise.

### Legitimate – developed through a process that reflects the values, perspectives, and concerns of those likely to be affected by the policy

# Generating agreement: from negotiation to agreement (“getting to yes”)

## Why states take the positions they do? They calculate costs of agreement and compare them to the benefits of the agreement

### Negotiation position (dependent variable): potential values

#### Pusher

#### Dragger

#### Bystander

#### Intermediate

### Ecological vulnerability: 1st of 2 independent variables

#### Can view as “costs country will face if problem is NOT addressed” or “benefits country will receive if problem is addressed”

#### Potential values: High or low

### Abatement costs: 1st of 2 independent variables

#### Costs country will incur if they take action to address the problem

#### Potential values: High or low

## Goal of negotiations

### Find the ZOPA (“zone of possible agreement”) (Raiffa 1982, 48) -- intersection of different countries’ positions

### Overcome “collective action problems” (incentives to cheat in Tragedy of the Commons problems)

### Write agreement to reduce costs or increase benefits to make “pushers” out of draggers, bystanders, intermediates

### Negotiators “three-fold choice” (Ikle 1964):

#### Accept terms currently on the table

#### Keep negotiating

#### Exit the negotiations

## Six Obstacles to Progress

### Disincentives for unilateral action

#### Developing countries: Other issues & incapacity

#### Developed countries: Have the option to adapt

### Obstacles to collective action

### Epistemic and normative contestation

#### Large, hard, and poorly understood problem

#### Real and manufactured uncertainty

#### Underlying conflict b/w two human values

### Psychological barriers to action

### Two of the three major drivers of emissions remain unaddressed

### Technological solutions alone may be inadequate

# Generating action: from agreement to action

## Alternative mechanisms for an effective climate agreement. [Examples from other areas where these mechanisms have worked in square brackets.] Obstacles to use of mechanisms in bold italics.

### “Sticks:” Punishment and deterrence. Sanction increases in emissions: Noncompliers conceal themselves. [WTO reciprocity rules.] Rarely used in international institutions.

### “Carrots:” Reward reductions in emissions. [Ozone case and North Korea nuclear case.] Noncompliers reveal themselves. But who will pay the rewards?

### “Locks:” Prevent activities that increase emissions. [Oil pollution equipment requirements.] But cannot prevent many such behaviors.

### “Fields of Dreams:” Create new opportunities to reduce emissions – promote provision of green energy technology “at cost” to developing countries. [Swedish nuclear weapons case. Ocean pollution inspection rules.] How do you manage political resistance to doing this?

### “Labels:” Improve knowledge about how there are short-term and significant non-climate change costs of certain behaviors. [Acid rain case.] What if it IS NOT in our short-term interests to act?

### “Sermons:” Normative education. Increase concern about the planet and future generations. [Human rights and democracy promotion.] Altering norms is difficult and takes a long time.

## Promoting change based on the IPAT equation from previous class

### Technology – changing behavior – how hard can it be

### Changing Population Growth

### Changing Affluence Growth

# The future of international climate change policy

## Options for progress and reasons for optimism

### International treaties

#### Even if don’t prompt near term change, they can foster longer term norm development

#### Some states may see it as in their interest to act unilaterally and may teach other states

### There are alternatives to international treatis

#### Cities (ICLEI) and states are taking action

#### Individuals are taking action

#### NGOs are taking action

#### MNCs are taking action

## Policy options

### Mitigation

### Adaptation

### Geoengineering

### Grieving and loss

## What are we doing about it?

### UN Framework Convention on Climate Change of 1992

### Kyoto Protocol of 1997

### National environmental policy

### State policies

### Local policies

### NGOs

### Multinational corporations

# A hard and scary problem: So, some words to live by

## Everyone thinks of changing the world, but no one thinks of changing himself. ~Leo Tolstoy

## Nobody made a greater mistake than he who did nothing because he could only do a little. ~Edmund Burke

## The true meaning of life is to plant trees, under whose shade you do not expect to sit. ~Nelson Henderson

## Unless someone like you cares a whole awful lot, nothing is going to get better. It's not. ~Dr. Seuss