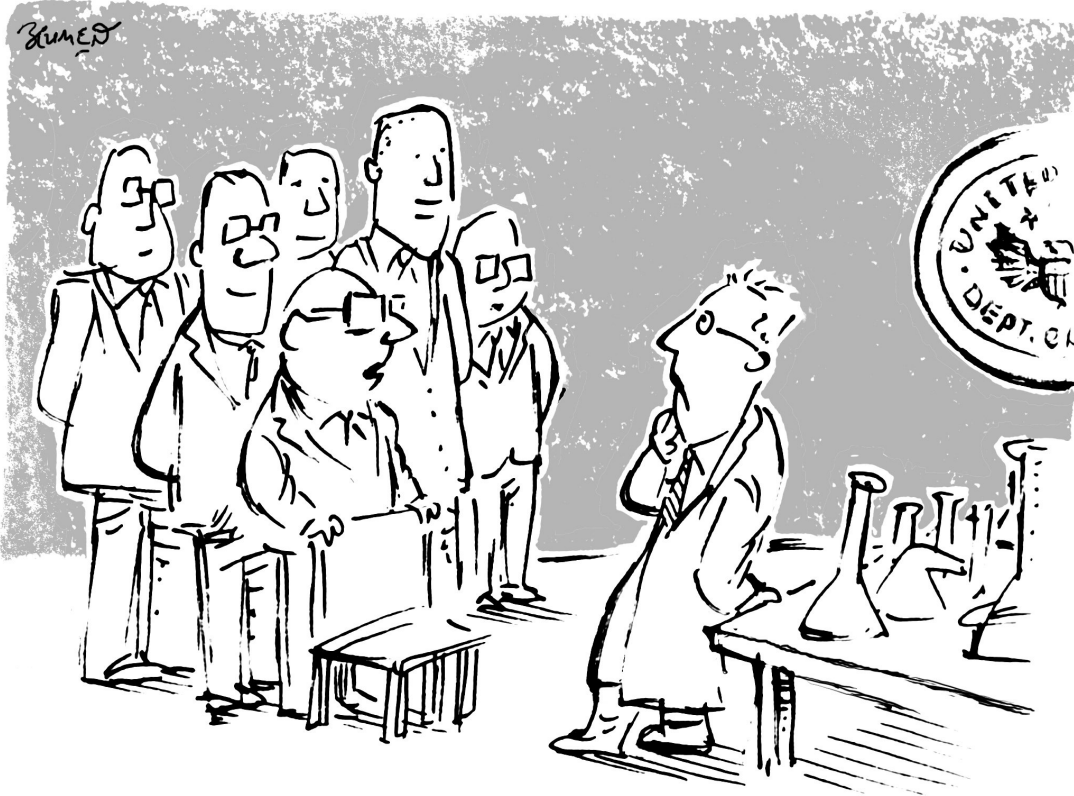




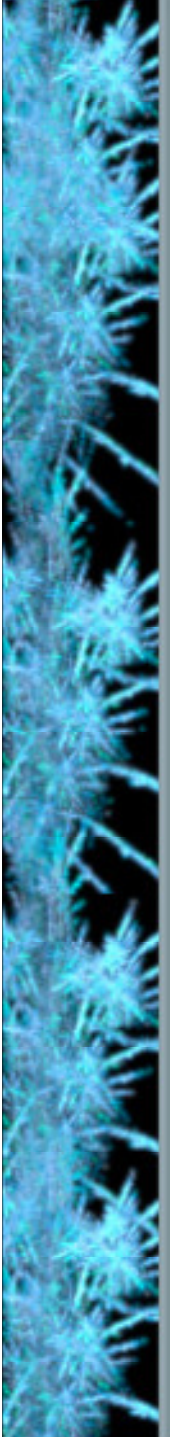
Protecting the Integrity of Policy- Relevant Science

**A classroom lecture prepared by
the Union of Concerned
Scientists (UCS)**

Federal Science – Compromised by Politics



“Don’t think of it as fudging the facts. Think of it as Science Fiction.”



Federal Science – Compromised by Politics

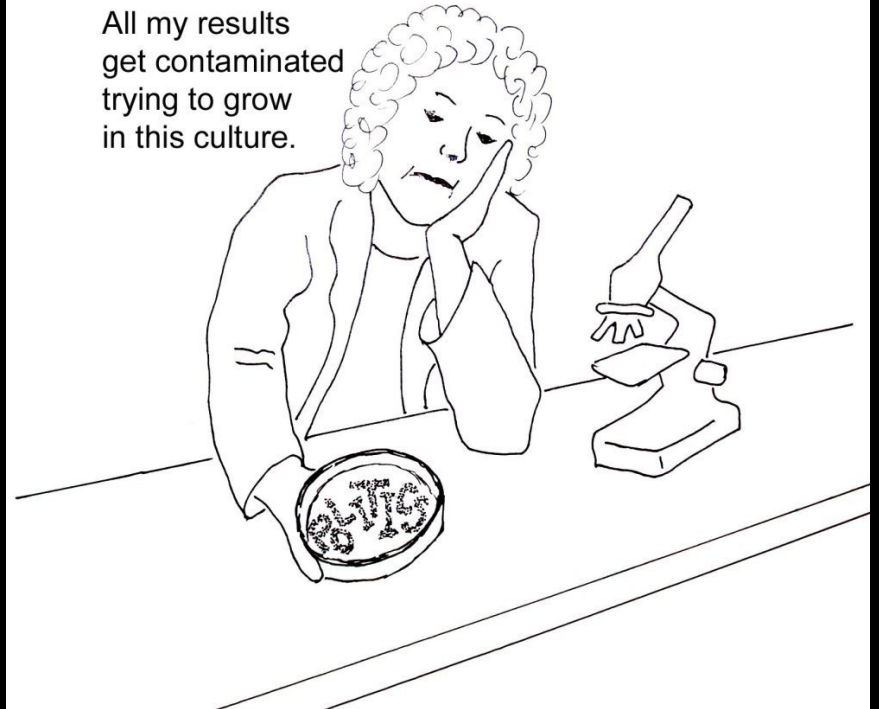
As a result of political interference in science:

- Americans take unsafe drugs, and tens of thousands have died from them.**
- Products sold to children are contaminated with toxins.**
- Environmental problems like global warming do not have effective policy solutions.**
- Critically endangered species are denied protections.**
- Communities and environments are polluted with dangerous chemicals.**

Federal Science – Compromised by Politics

Over 15,000 U. S. scientists have joined the Union of Concerned Scientists to call for reforms that would restore scientific integrity to federal policy-making.

All my results
get contaminated
trying to grow
in this culture.





Outline: Protecting the Integrity of Policy-Relevant Science

- **The Boundary of Science and Policy**
- **Defining Political Interference**
- **Example: Particulate Matter**
- **Integrity in the Scientific Process**
- **Methods of Political Interference**
- **Example: Climate Change Research**

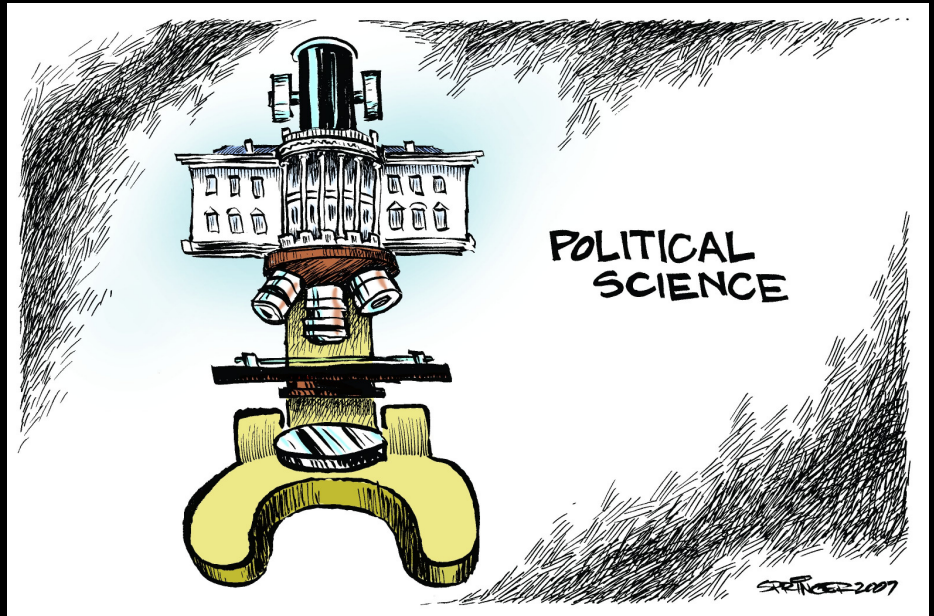


The Boundary of Science and Policy

- **Science builds on shared knowledge—a greater understanding of nature is achieved only through an open and public exchange of ideas**
- **When scientific applications cross into the policy realm, the openness of science can clash with often-valid restrictions such as individual privacy, national security, and corporate policies intended to restrict public access to information**

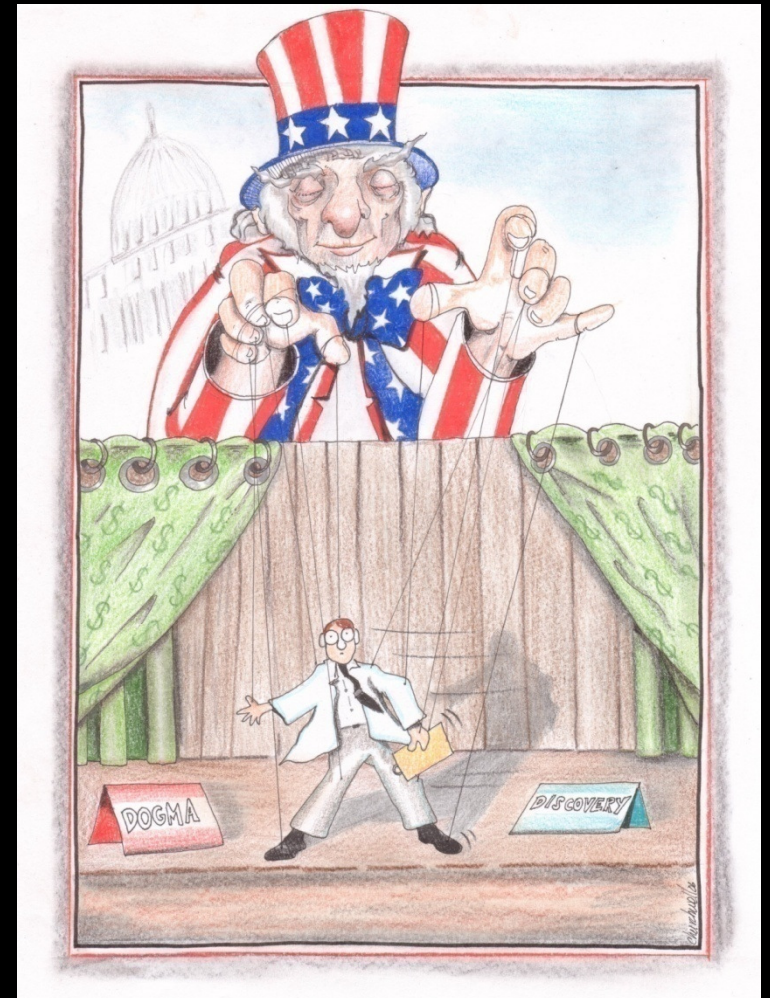
The Boundary of Science and Policy

- When policy making distorts science, we risk:
 - Human health
 - Global security
 - Environmental sustainability
- Good science is a necessary component of good policy



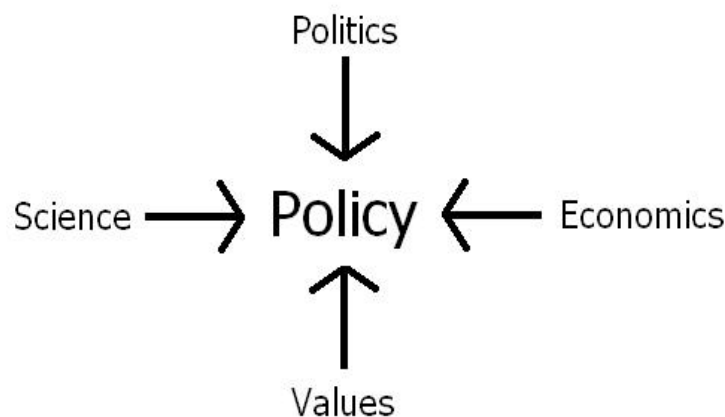
Political Interference

Attempts to inappropriately undermine, alter, or otherwise interfere with the scientific process or scientific conclusions for political or ideological reasons



Science in the Policy Arena

- Science is an increasingly important factor in decisions the government makes about health, security, and sustainability
- Science is only one aspect of the policy process, but it must remain an independent one



- Manipulation or suppression of science *before* it enters the public policy arena is not “politics as usual” and is not OK



Science is Nonpartisan

“Science, like any field of endeavor, relies on freedom of inquiry; and one of the hallmarks of that freedom is objectivity. Now, more than ever, on issues ranging from climate change to AIDS research to genetic engineering to food additives, government relies on the impartial perspective of science for guidance.”

**President George H.W. Bush, April 23,
1990**

Example: Lead in Children's Lunchboxes

- Lead is a powerful neurotoxin in children which can cause brain damage, mental retardation, behavior problems, liver and kidney damage, and in extreme cases, death.
- Lead has been detected in dangerous quantities in paint, children's metal jewelry, candy, and in vinyl products such as baby bibs and lunchboxes.





Example: Lead in Children's Lunchboxes

- In 2005, the Consumer Product Safety Commission (CPSC) told parents that they found “no instances of hazardous levels” of lead in the vinyl linings of children's lunchboxes
- Internal documents obtained through the Freedom of Information Act later revealed that CPSC had tested fewer than 10 lunchboxes at the time of the statement.
- CPSC also manipulated its testing procedure to produce artificially “safe” results.

Example: Lead in Children's Lunchboxes

- Initial lead testing involved dissolving pieces of the vinyl – these tests showed lead content levels up to 16 times the federal standard.
- CPSC replaced this with a swipe test which only measured lead on the surface of the bag.
- Testers wiped a small area of the vinyl several times with the same pad, removing the highest amounts of lead with the first few swipes.
- CPSC then averaged more and more wipes of the same location to lower the amount of lead detected.



Example: Lead in Children's Lunchboxes

- CPSC defended their use of an average exposure, even though lead accumulates in the body, meaning exposures add up instead of average out.
- Because of CPSC's manipulation of data and testing, nothing was done to prevent toxic lunch bags from getting in the hands of children.



The Scientific Process: How do we know what “good science” is?

- Scientists follow logical paths that refine our knowledge
- The modern scientific process looks like this:

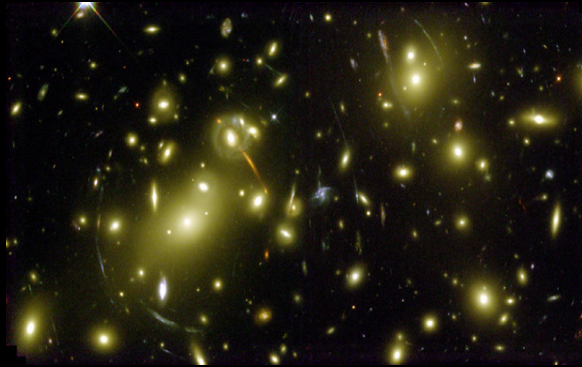
Idea → Funding → Research → Conclusions → Publication

- All scientific ideas are subject to challenge and modification



The Scientific Process

- When the scientific community comes to a consensus, this means the idea has withstood rigorous testing and represents our best understanding of the subject being studied
- Some uncertainty will always remain; science strives to minimize that uncertainty to reasonable levels





Quality Control

- **The scientific community polices itself for quality; publication of a paper in a peer-reviewed journal means that independent scientists believe the paper is “good science” (i.e., uses quality data and methods to arrive at a defensible position)**
- **This does not necessarily mean “correct science”—all experiments must have repeatable results**

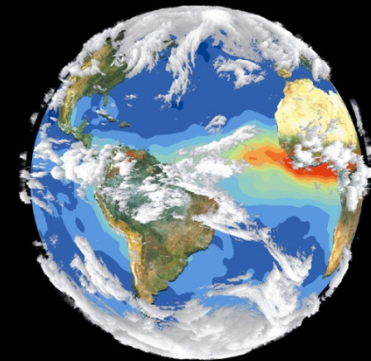
Quality Control

- Research that does not agree with the accepted consensus is still published as long as the scientific method behind it is valid
- Over time, science is self-correcting—an open debate of theories weeds out weak ideas until a strong consensus is reached



Policy-Relevant Science Should:

- Be question-driven
 - Serves the public interest
- Be independent
 - Unconstrained by conflicts of interest
 - Objective and unbiased
- Reach evidence-driven conclusions
- Be Open and transparent
 - All data analyses and results are publicly available
- Have results can be reviewed, reproduced, and verified as free of bias, fraud, and falsification



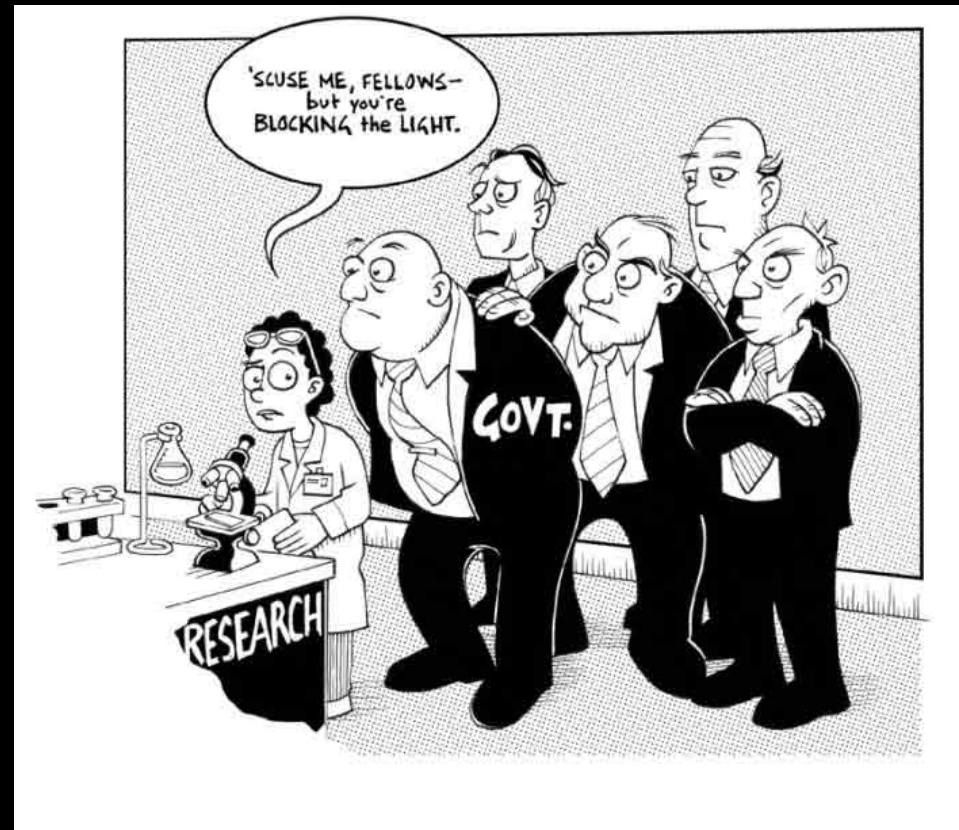


Some Methods of Political Interference

- **Direct Interference**
 - Scientific results are suppressed, selectively withheld, or intentionally delayed from being released to the public
 - Scientific results are altered, manipulated, or distorted to justify policy decisions
 - Qualified scientists are excluded from the policy process because of their political beliefs
 - Government scientists are silenced, muzzled, or intimidated

Some Methods of Political Interference

- Indirect Interference
 - Limiting access to information
 - Reducing transparency
 - Sidelining science from the decision-making process



Interference Example: Climate Change

There exists, and has existed since the 1990s, an overwhelming consensus among scientists that the planet is warming and that humans' heat-trapping emissions are the primary cause of this change





Example: Climate Change

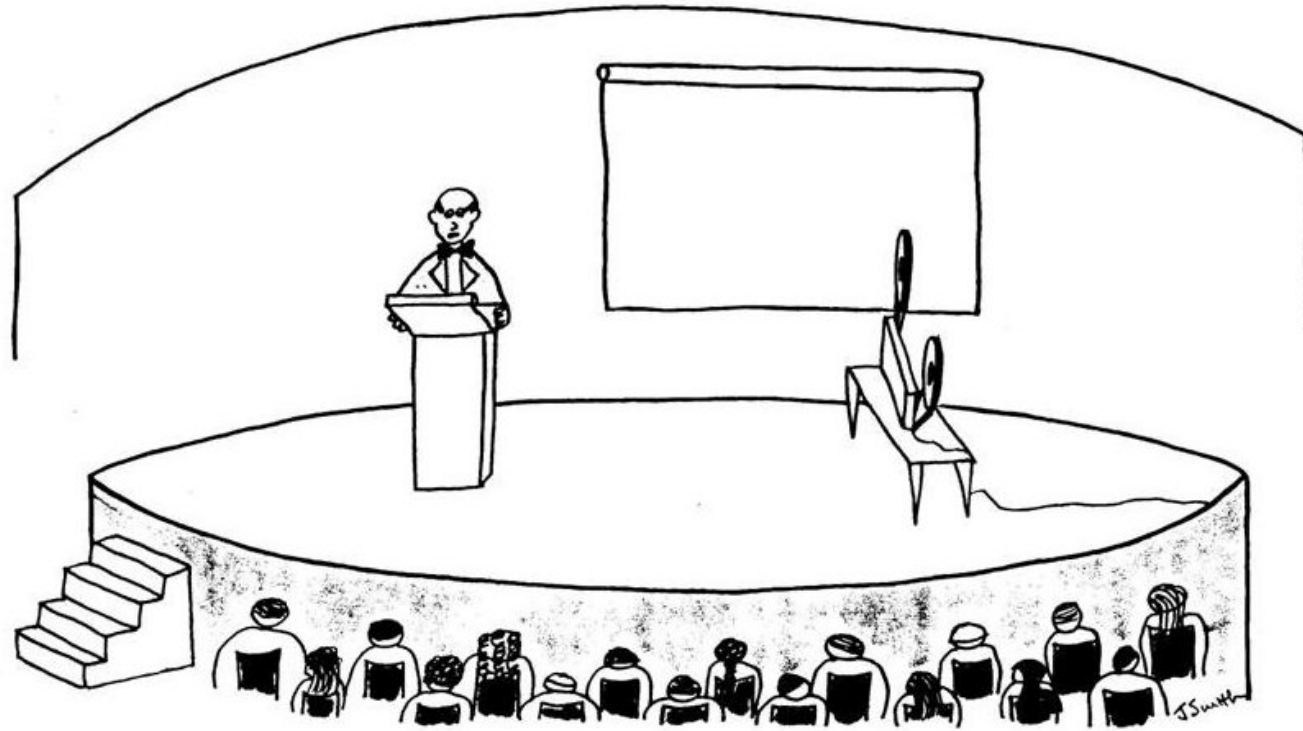
- The Intergovernmental Panel on Climate Change Fourth Assessment (2007) states:
 - “Most of the observed warming over the last 50 years is very likely to have been due to the increase in greenhouse gas concentration” (“very likely” is defined as >90% likelihood)
 - It is “extremely unlikely” that all observed warming could be due to natural cycles (“extremely unlikely” is defined as <5% likelihood)
- In the United States, political interference in climate change science contributes to the appearance of an ongoing debate about the causes



Example: Climate Change

- **Editing and censoring science**
 - A Bush administration oil lobbyist edited an EPA report on climate change
 - References to global warming were deleted from a National Oceanic and Atmospheric Administration (NOAA) draft report
 - Government scientists were told not to use the term “climate change” in titles and abstracts of papers for a CO₂ conference
 - White House officials heavily censored Congressional testimony from the CDC that described the hazardous effects of climate change on public health

Example: Climate Change



“Thus, when the film is run backwards, we see that it contains a hidden message: the glaciers are actually getting larger.”



Example: Climate Change

- **Muzzling scientists**
 - Scientists have been told not to speak to the press
 - Public affairs offices have:
 - Forced scientists to get permission for all media interviews
 - “Routed” interview requests to scientists with “policy-favorable” opinions
 - Accompanied scientists to interviews to act as “minders”
 - Edited or withheld press releases about climate change science

Example: Climate Change



- Consequences
 - We fail to protect future generations and our planet from the consequences of global warming
 - Policy makers cannot make fully informed decisions
 - Federal agencies are unable to fulfill their scientific missions



Example: Climate Change

- **Consequences**
 - The public is widely misinformed about the existence of a scientific consensus
 - According to a Pew Research Center for the People and the Press poll (July 2006):
 - 70% believe there is solid evidence that the earth is warming
 - Only 41% believe it is due to human activity
 - According to an ABC News poll (March 2006):
 - 64% say there is “a lot of disagreement” among scientists on the question (compared with 67% in a similar poll in 1998)
 - Only one-third think scientists agree that global warming has begun
 - Public confusion means policy inaction



Protecting the Integrity of Policy- Relevant Science: Part 2

**A classroom lecture prepared by
the Union of Concerned
Scientists (UCS)**



Politicization of Science

- While science is only one part of policy making, its role must remain independent and free
- Scientific integrity is compromised when politics infringes on the scientific process by manipulating, suppressing, or undermining scientific conclusions with the intent of justifying policy decisions
- Use of politicized science leads to policy decisions not based on the best available science of the day, and can lead to severe consequences for human health, the environment, and national security



Outline: Protecting the Integrity of Policy-Relevant Science

- **Direct Politicization of Science**
 - **Censorship and Suppression**
 - **False or Inaccurate Science**
 - **Distortion of Scientific Advice**
- **Indirect Politicization of Science**
 - **Example: Regulatory Policy**
- **Broad Scope**
- **Consequences of Political Interference**
- **Solutions and Reforms**

Politicization of Science

Political interference occurs
both through direct and indirect means

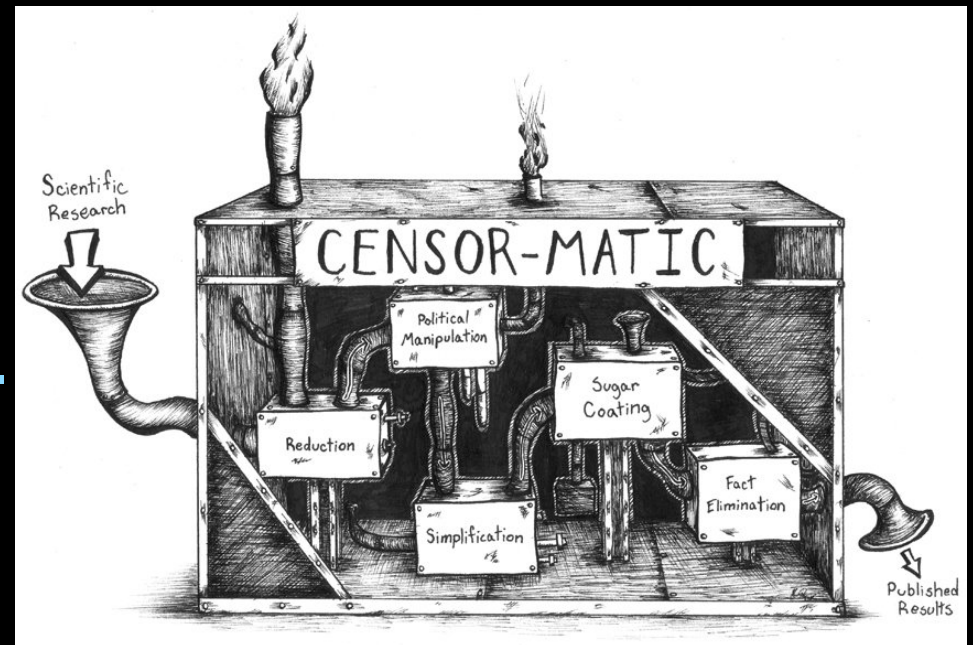


"You are completely free to carry out whatever research
you want, so long as you come to these conclusions."

Direct Politicization of Science

Most direct politicization of science falls into three categories:

- Censorship and suppression of federal science
- Dissemination of inaccurate science-based information
- Manipulation and distortion of scientific advice



Censorship and Suppression

- **Clear Skies Initiative**
 - The EPA withheld an analysis that showed a Senate plan would be more effective at reducing pollution at about the same cost as the White House's Clear Skies Initiative



Censorship and Suppression

- Antidepressants and children
 - A Food and Drug Administration (FDA) official barred a top agency expert from testifying about his research on suicide risks
 - He was told to delete information being submitted to Congress and to conceal those deletions



Censorship and Suppression

- **Vioxx**
 - An FDA official attempted to suppress studies that showed the pain medication Vioxx increased the risk of heart attack
 - Dr. David Graham, who conducted the studies, said agency officials subjected him to “veiled threats” and suggested “watering down” the report



Censorship and Suppression

- **Bull trout**
 - The U.S. Fish and Wildlife Service (FWS) deleted 55 pages of analysis showing the economic benefits of bull trout recovery
- **Endangered salmon**
 - Science-based recommendations from six top marine ecologists were stripped from an official National Marine Fisheries Service (NMFS) report



Censorship and Suppression



False or Inaccurate Science

- **Breast cancer and abortion**
 - False information suggesting a link between abortion and breast cancer was placed on a Centers for Disease Control (CDC) website
- **Lead content in vinyl lunch boxes**
 - The U.S. Consumer Product Safety Commission (CPSC) assured parents that children's vinyl lunch boxes were safe even though its own testing revealed high levels of exposure to lead
 - The CPSC then changed its testing procedures to manufacture data that would fall within current lead exposure limits



Distortion of Scientific Advice

Scientific advisory panels, which review the scientific basis for federal regulations, have been manipulated





Distortion of Scientific Advice

- **Scientific advisory panels compromised and marginalized**
 - A doctor with questionable qualifications was confirmed to a panel on reproductive health; he has recommended scripture readings for premenstrual syndrome and refused contraceptives to unmarried women
 - A CDC panel on childhood lead poisoning was stacked with five members likely to vote against stricter lead exposure limits
 - A panel at the CDC's National STD Prevention Conference was changed to include a pro-abstinence speaker
 - A panel of nuclear arms experts was dismissed after publishing reports contrary to the Bush administration's policy



Distortion of Scientific Advice

- **Particulate matter**
 - The White House inserted last-minute changes to a proposed rule on particulate matter that distorted the science, according to scientists on the Clean Air Science Advisory Committee
 - When issuing the final regulations, the Bush administration ignored the committee's recommendations
- **Ketek (antibiotic medication)**
 - The FDA ignored its own safety officials, who recommended Ketek be withdrawn from the market
 - The FDA relied on post-marketing surveillance from other countries (often less reliable than in the United States) in its decision to approve Ketek

Distortion of Scientific Advice

- Gunnison's prairie dog, white-tailed prairie dog, roundtail chub, Gunnison's sage grouse
 - Manipulation and distortion of scientific information by Interior Department political appointees
 - Edits to scientific documents preserved by Microsoft Word's "track changes" feature
 - Scientists' determinations reversed



Photo by Rob Bennetts



Distortion of Scientific Advice

- Florida panther
 - The U.S. Fish and Wildlife Service (FWS) used faulty data to limit the protection of Florida panther habitat
 - After blowing the whistle, FWS biologist Andrew Eller was fired
 - Eller was reinstated after the government admitted its errors



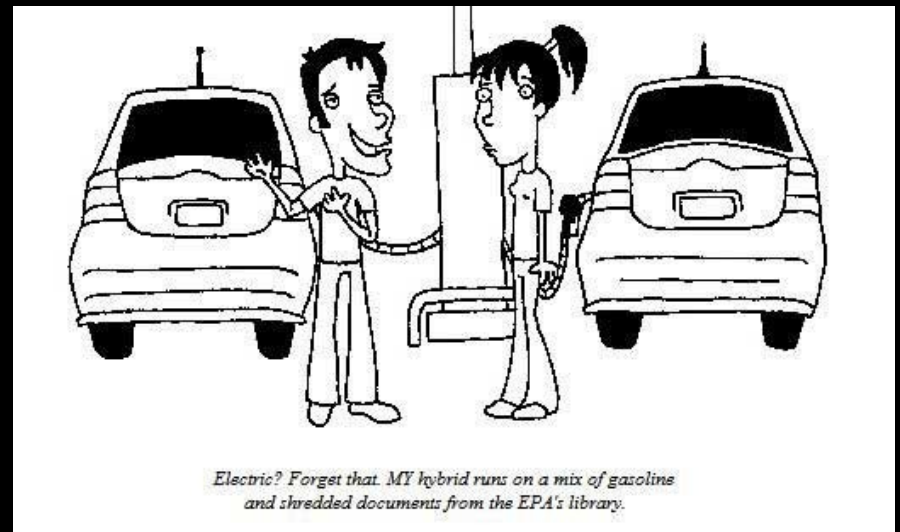


Indirect Politicization of Science

- Besides the more obvious attacks on scientific integrity such as censorship and editing, subtle encroachments include limiting access to information, reducing transparency, and sidelining science from the decision-making process
- Examples:
 - The EPA plans to scale back reporting requirements for industries producing and releasing toxins, reducing the public's right to know about toxins released in local communities

Indirect Politicization of Science

- **Examples continued:**
 - The EPA has closed many scientific libraries, cutting off scientists and citizens from unique documents
 - The FWS only allows biological science that would refute a petition to list an endangered species in the decision-making process





Sidelining Science: Regulatory Policy

- **Executive Order 13422 centralizes regulatory processes under the White House by:**
 - **Placing political appointees at the head of all regulatory work at each agency, giving them first right of refusal for new regulations (even before the scientific research begins)**
 - **Insisting agencies justify new regulations as a “market failure” instead of citing the consequences the regulation is meant to avoid (for example, regulating a toxin after it has caused damage rather than before it comes into contact with sensitive populations)**

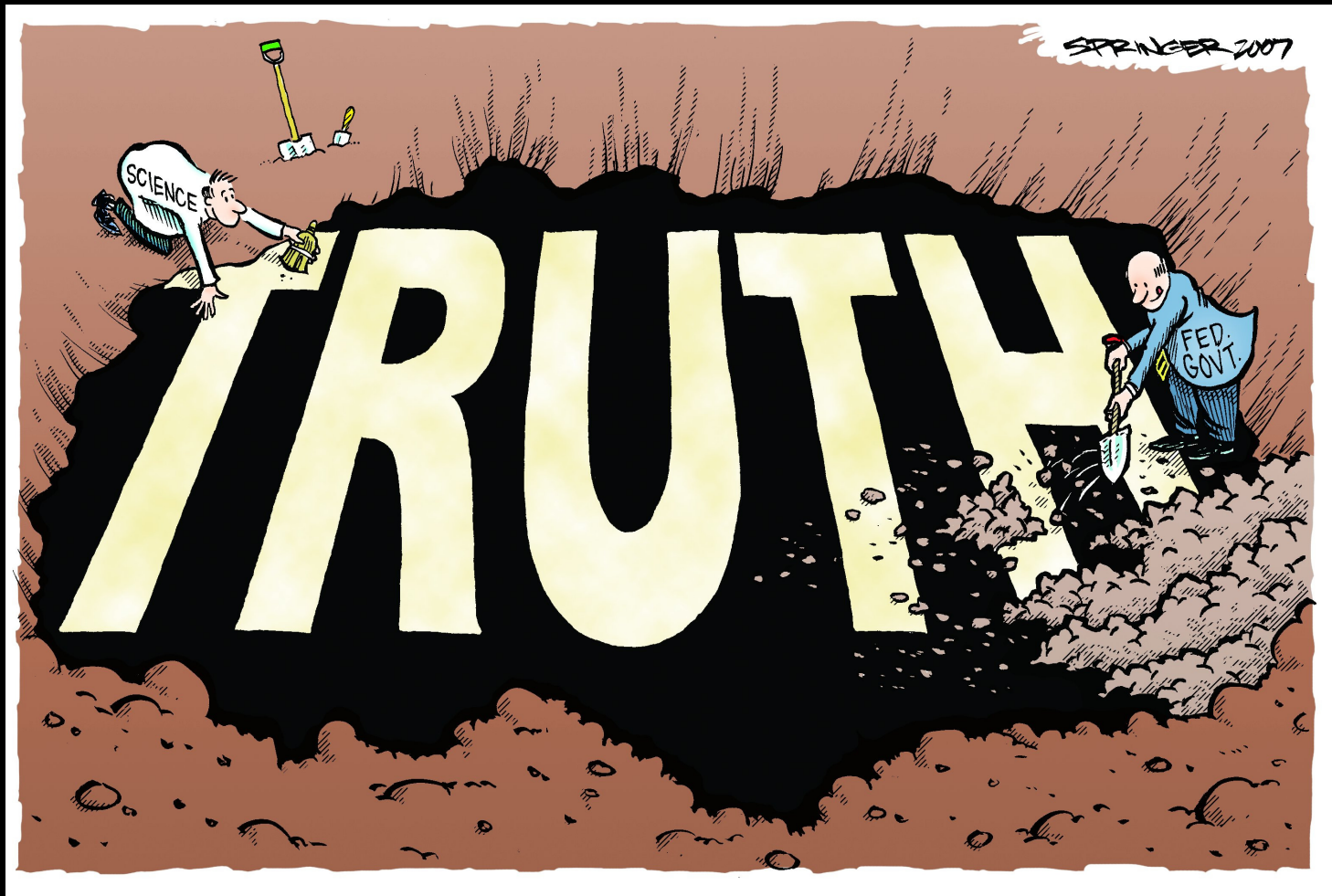
Sidelining Science: Regulatory Policy

These changes upset our system of checks and balances:

- Agencies receive the authority to write regulations from Congress
- The new executive order gives the White House and its political appointees control over the passage of new regulations



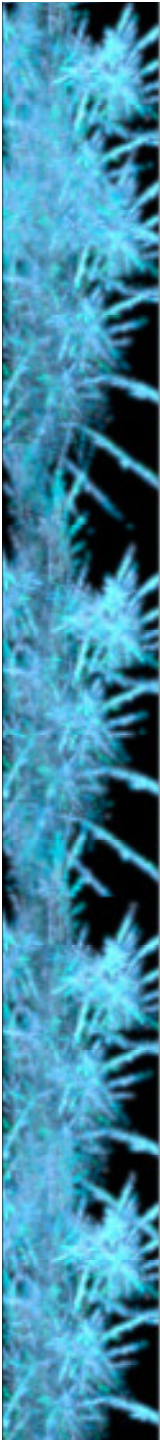
Politicization of Science





Broad Scope

- **Politicization of science is pervasive throughout many federal agencies**
 - **Centers for Disease Control and Prevention (CDC)**
 - **Consumer Product Safety Commission (CPSC)**
 - **Fish and Wildlife Service (FWS)**
 - **Food and Drug Administration (FDA)**
 - **Environmental Protection Agency (EPA)**
 - **National Aeronautics and Space Administration (NASA)**
 - **National Oceanic and Atmospheric Administration (NOAA)**
 - **U.S. Department of Agriculture (USDA)**
 - **And more**



Broad Scope: Scientist Surveys

The Union of Concerned Scientists (UCS) has conducted numerous surveys of federal scientists to gauge the levels and consequences of political interference. Of the respondents:

FDA	FWS	NOAA Fisheries
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18%	20%	24%
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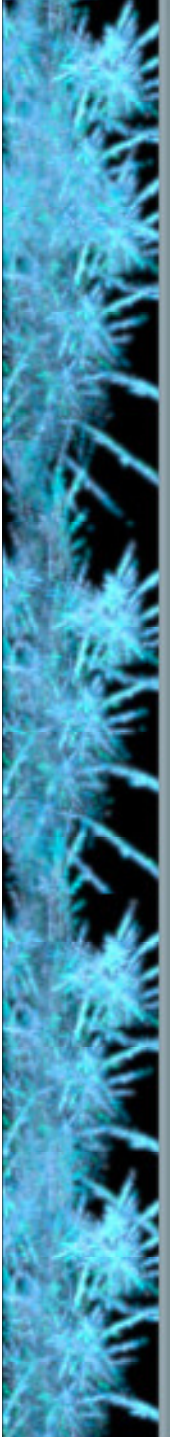
... were asked to inappropriately exclude or alter scientific information in documents for non-scientific reasons

61%	70%	58%
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... knew of cases where political appointees had inappropriately injected themselves into decisions or actions

60%	56%	53%
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... knew of cases where commercial interests had inappropriately induced or attempted to induce the reversal, withdrawal, or modification of agency determinations and actions

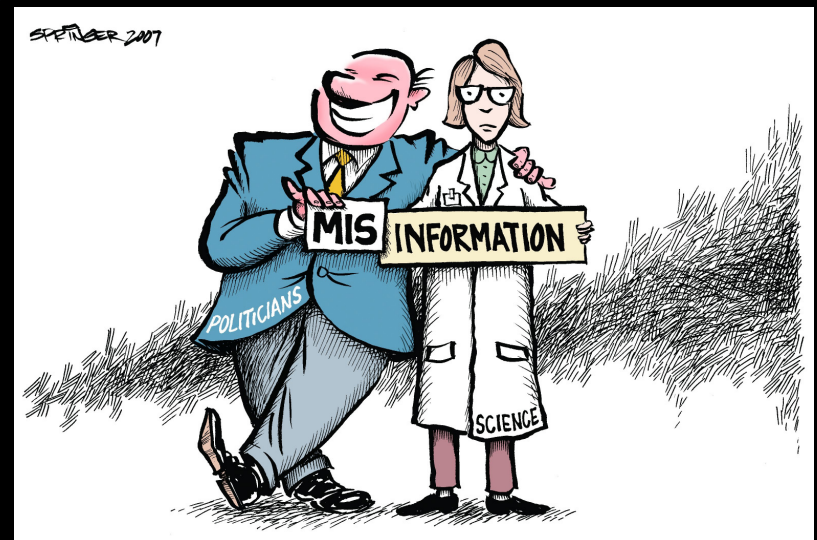


Broad Scope: Scientist Surveys

- **Of more than 1,800 federal scientists across nine agencies who responded to UCS surveys, 699 (39%) reported that they fear retaliation for openly expressing concerns about their agency's mission-driven work—this number should be zero**

Political Interference has Broad Consequences

- Institutionalization of the abuse of science
- Centralization of policy making
- Increased power of political appointees
- “Cultural” acceptance of interference
- Growing public scientific illiteracy and loss of faith in scientists





Consequences of Political Interference

- **Climate Change**
 - **Interference:** Political appointees with no scientific training edited EPA climate reports and barred climate scientists from speaking to the press
 - **Consequence:** The public becomes misinformed about the harmful consequences of climate change, indirectly supporting policy inaction

Consequences of Political Interference

- **Endangered Species**
 - **Interference:** Widespread suppression, manipulation, and editing of scientific research on numerous endangered species
 - **Consequence:** Critical habitat is not protected and many endangered species face increased risk of extinction

ENDANGERED
SPECIES



BALD EAGLE



BLUE BUTTERFLY



DESERT TORTOISE



INDEPENDENT SCIENTIST



Consequences of Political Interference

- **Drug Safety**
 - **Interference:** The FDA suppressed studies showing that medications such as Vioxx and antidepressants potentially increase the risk of various life-threatening conditions
 - **Consequence:** Those using the medications were exposed to these risks without their knowledge, resulting in serious side effects such as heart attack and death (for example, 55,000 premature deaths estimated for Vioxx)



Consequences of Political Interference

- **Air Pollution**
 - **Interference:** When the EPA set limits on mercury emissions, it suppressed the results of a study showing the benefits of a stricter standard
 - **Consequence:** Weak restrictions on pollutants such as mercury can result in unnecessary health problems



Consequences of Political Interference

- **FEMA Emergency Housing**
 - Despite warnings, FEMA delayed testing the federally-provided travel trailers of Hurricane Katrina evacuees for formaldehyde, a hazardous chemical
 - Over 100,000 households lived in toxic housing before public and Congressional pressure forced them to test the trailers
 - After 2 years of stalling, testing revealed formaldehyde levels in excess of 4 to 40 times acceptable levels.

Solutions and Reforms

- The government should develop policies that will ensure:
 - Openness
 - Transparency
 - Accountability
 - Prevention





Solutions and Reforms

- **Federal agencies should develop clear media policies that explicitly:**
 - **Limit the power of political appointees to interfere with press releases and contacts with the media**
 - **Give scientists the right of last review before their research is published**
 - **Affirm the right of agency scientists to express their personal views, as long as they clearly state they are doing so in a private capacity**



Solutions and Reforms

- **Whistleblower protections should be strengthened**
 - Whistleblowers are employees that report misconduct such as fraud, safety violations, and corruption
 - Whistleblower protections would shelter these citizens from repercussions such as harassment, suspension, or termination
- **Agencies should explicitly inform and train scientists about their personal rights (in respect to publication, communication, and protection)**



Solutions and Reforms

- **The independence of scientific advisory committees must be ensured**
 - **Enforce the Federal Advisory Committee Act (FACA), which requires the disclosure of any conflicts of interest**
 - **FACA also requires a balance in viewpoints, which is meant to prevent the stacking of committees with proponents of a single viewpoint**
 - **Forbid the questioning of nominees about their political affiliations and views**

Solutions and Reforms

- Congress should ensure the quality of federal science by:
 - Increasing oversight of federal science agencies through hearings and investigations
 - Restoring the Office of Technology Assessment (OTA), which produced independent scientific analyses for Congress before it was abolished in 1995



Solutions and Reforms

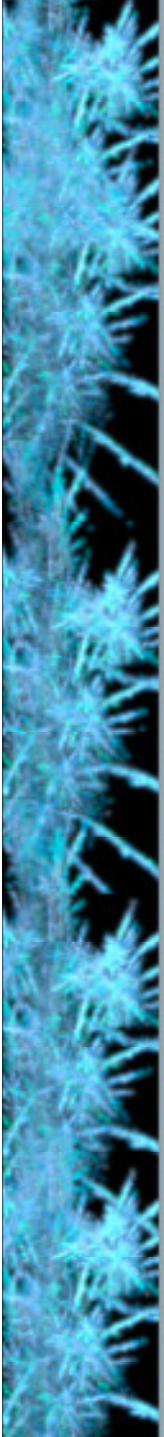
- **The president should strengthen the scientific advice provided to the executive branch**
 - **The Director of the White House Office of Science and Technology Policy (OSTP) should be restored to the level of assistant to the president**
 - **The staff at OSTP should be expanded to increase access to independent scientific advice**





Solutions and Reforms

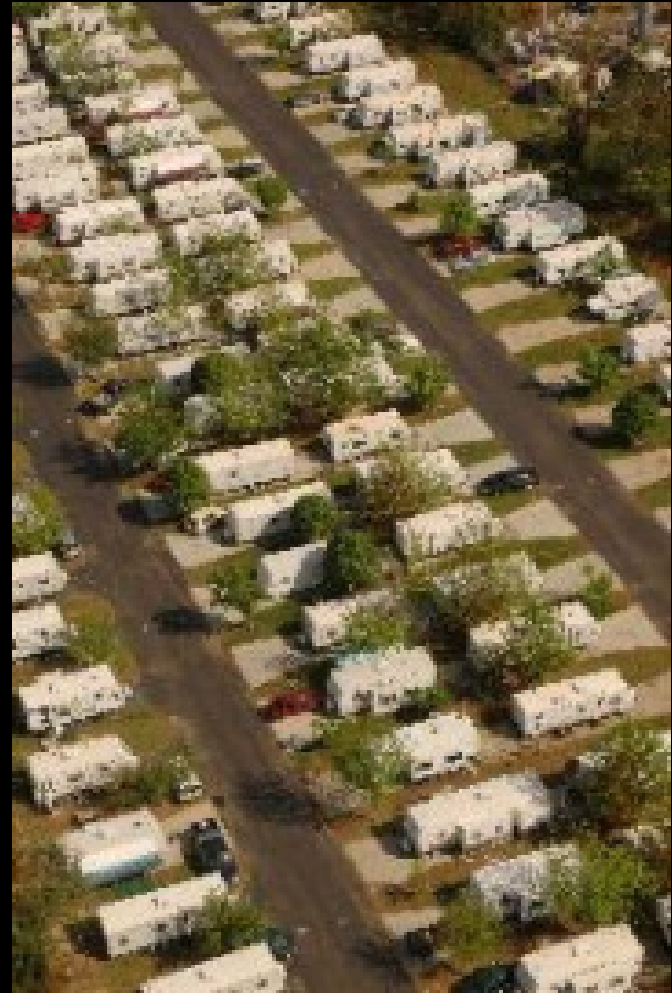
- **Action you can take at the grassroots level:**
 - **Join or support an organization advancing the cause of scientific integrity**
 - **Engage your friends, relatives, teachers, etc. in a dialogue about the politicization of science**
 - **Urge your elected officials to support scientific integrity legislation and initiatives**
 - **Hold an event, invite a speaker, or host a roundtable with a scientific integrity theme**



- **Additional Examples**
- **Additional Examples**
- **Additional Examples**

Example: FEMA Trailers

- After Hurricane Katrina, the Federal Emergency Management Agency (FEMA) provided 120,000 mobile homes and travel trailers to Gulf Coast Evacuees.
- Residents soon began to experience respiratory problems, and independent testing attributed these complaints to high levels of formaldehyde in the trailers





Example: FEMA Trailers

- Instead of assessing the immediate danger to residents, FEMA and the EPA agreed to test ventilation methods on unoccupied trailers
- Internal documents show that they suspected that formaldehyde levels would be dangerously high, but they wanted to avoid having “ownership of the issue”
- The analysis that was done of the unoccupied trailers test manufactured a high “level of concern” value for formaldehyde, instead of using any of the accepted federal guidelines for exposure



Example: FEMA Trailers

- **After pressure from Congress, FEMA and CDC conducted testing on occupied trailers.**
- **Preliminary testing completed in early 2008 showed that formaldehyde levels in trailers were, on average, 4 times higher than acceptable.**
- **As a result of FEMA's foot dragging, some families spent over 2 years in unsafe levels of formaldehyde.**

Example: Southwestern Bald Eagle

- A petition to retain Endangered Species Act protections for the southwestern population of the bald eagle was denied
- Internal documents show that high ranking officials told the scientists that they had “reached a policy call” that the bird did not need extended protections





Example: Southwestern Bald Eagle

- **Scientists were forced to manipulate their conclusions to support this policy decision.**
- **In addition, internal documents show that FWS only uses their scientific information to refute petitions for protection.**
- **In this system, scientists are not allowed to include anything that supports giving species protections.**
- **This contradicts their responsibility under the Endangered Species Act to make their decisions “solely on the basis of the best scientific and commercial data available”**

Example: Particulate Matter

- **Health effects**
 - Fine particulate matter (PM 2.5) consists of particles less than 2.5 micrometers in diameter
 - Sources include agricultural activity, vehicle exhaust, and emissions from coal-fired power plants
 - PM 2.5 exposure is linked to heart disease, respiratory ailments, and premature death
 - More than 165 million people live in areas with dangerous levels of PM 2.5





Example: Particulate Matter

- **Scientific recommendations twisted**
 - In 2005, the Environmental Protection Agency's (EPA) Clean Air Scientific Advisory Committee (CASAC) recommended lowering the average annual limit for PM 2.5
 - In September 2006, EPA Administrator Stephen Johnson issued a final ruling on PM 2.5 that left the regulations unchanged
 - No EPA administrator has disregarded CASAC's advice in its almost 30-year history



Example: Particulate Matter

- **New standards not protective**
 - Johnson justified his decision by claiming there had been disagreement within **CASAC**
 - In reality, 20 of the 22 committee members had voted in favor of tightening the standard
 - Some **CASAC** members alleged that the EPA had also “twisted” and “misrepresented” their recommendations by adding last-minute edits from the White House that attempted to cast doubt on the need for a tighter standard



Example: Particulate Matter

- **Science marginalized for future studies**
 - The EPA has since proposed changes to the way Clean Air Act standards are drafted and finalized
 - The new process replaces scientific assessments with a “narrowly focused policy assessment document” that should “reflect the agency’s views”
 - CASAC has been removed from the process and is only allowed to comment after standards have been proposed

Example: Particulate Matter

