PLS 540 – Environmental Policy and Management
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Topic: Science and the Policy Process

Science and the policy process

- For champions of scientific rationality, the ideal policy process is one where science replaces politics
  - Presumably, environmental policy would be more effective if contending ideas and arguments were judged solely on their technical merits
  - If policymakers could only agree on what the facts were and what they meant, then debates would shift from questions about whether to act to how and when they should act
  - Science would guide policy while politicians argued over who should pay for policy reforms and how much risk was acceptable
- Environmental policymaking has several characteristics that set it apart from other policy areas
  - It alone treats nonhuman beneficiaries of policy as prominent target groups
    - An added dimension to Lowi's (1972) classic typology of regulatory, distributive, and redistributive policy
  - Grants science a strong voice in agenda setting, formulation, and evaluation
  - It tends to be more "science-driven" than other policy domains
  - Tends to be somewhat less incremental than other policy domains
- Real world of science and politics is complicated
  - Policy arguments seldom win strictly on their scientific merits
  - Science is rarely unequivocal: "Politics dominates when science equivocates (Hemple 1996, 119)
  - Congress is an assembly of scientific amateurs who must enact programs of great scientific and technical complexity even though they have little knowledge of the substance and details of the policy issues
- World of policymaking is different than the world of science
  - Policymaking is a process of incremental distribution or redistribution of wealth and power
  - It steers power and resources disproportionately to groups that are politically organized and are viewed positively by the policy elites.
  - Content of policy almost always reflects the process that made it
  - Because of the numerous points to block policy, policies often evolve as they are made and reflect compromises whereas science does not allow for compromise
  - Scientists are oriented towards the future while politicians are oriented towards the here and now
  - Politicians need information immediately but science often takes time and cannot be hurried

- Politicians are receptive to and are willing to give an important role to science
  - They know that they often know little about complicated scientific or technical problems
  - "Scientists" are often respected and are often perceived to be "unbiased" even though there is no reason to believe that will be the case
  - From a practical standpoint, resorting to science can help politicians deflect criticism they might otherwise incur
  - Science can provide a paradigm that help structure political debate by eliminating some possible policy options
  - Science often provides some unbiased objective information that helps inform political debates
- What public officials and scientists want from each other in the policy process can be very different (Rosenbaum 1998, 126)
  - Public officials want scientific information accurate enough to indicate precisely where to set standards and credible enough to defend in the conflicts that follow
  - Scientists want government to act quickly and forcefully on issues they believe are critical but they rarely can produce the information in the form and within the timeframe needed by decisionmakers
  - Often scientific information leaves public officials with the need to make decisions in the face of fragmentary or disputed information
  - Scientists are often frustrated that decisionmakers are unwilling to await the slow testing and validation of data.
  - Instead, decisions are made or unmade without the scientific information that presumably should guide decision making

Science plays many roles in the policy process

- Science plays many roles
  - Science can often raise issues on political agendas and helps define policy options
  - Unfortunately, existing data on environmental quality is often scarce, monitoring is often undervalued and underfunded
  - Experience with many problems is too recent to provide carefully tested evidence
  - Activities such as monitoring, forecasting, statistical analysis, C/B analysis, and risk assessment are tedious, time-consuming, underfunded, politically dull, and are done in time frames that don't match the realities of the policy process
  - Competition of policy analysts/scientific experts among government and NGOs makes it more difficult to rely on "science" to inform decisions
  - Interestingly, while the media can often take scientific results and arouse public and political concerns, science and conflicting results can simultaneously delay and confound the search for a solution
  - What weight should different information such as scientific, technical, cost/benefit, risk assessment, values, political feasibility have in the decision making process?
- Environmental issues present a challenging arena for problem solving
  - They are complex, plagued with uncertainty, and extremely political
  - They often seem intractable because they are ill structured
  - They are "*wicked*" problems in that they are complex, there are many ways of looking at the problem, there are many possible solutions, the problems are connected to other

problems, and there is rarely one solution – this raises questions about whether they are suitable for rational techniques
    - There is no definitive formulation of a wicked problem
    - Wicked problems have no stopping rule
    - There is no immediate or ultimate test for a wicked problem
    - Wicked problems do not have an exhaustibly describable set of potential solutions
    - Every wicked problem can be considered as the symptom of another problem
  - Science and transscience
    - Science includes problems or questions that can be formulated in the language of science and are subject to testing by formal scientific methods
      - EX: Will a marine organism accumulate a toxic compound above background levels
    - Solving environmental problems often involves questions of "*transscience*" in that the problems can be defined in the language of science but cannot be solved by science – some political or value judgments must be made
      - Setting a safety standard for a toxic substance
  - Making choices involves more than just finding a technical solution. Environmental choices reflect politics, values, and expectations as much as scientific facts
- In the policy process, we are concerned with two types of scientific information
  - *Scientific Information*:
    - Scientific information is "acquired by individuals through education and/or experience about the *regularities* of relationships among key variables rather than the particular state of those variables in a specific context (Ostrom et al. 1993, 50)."
    - Examples of scientific costs include basic research on how ecological systems function and the effects of contaminants on these systems.
  - *Time and place information*:
    - Time and place information refers to the knowledge "acquired by individuals who know the nature of a particular physical and social setting (Ostrom et al. 1993, 50)."
    - Examples of time and place information include the local, social, and physical environmental characteristics and the nature and extent of particular environmental problems.
- Not unusual that to find significant information asymmetries among participants in the policy process (different perceptions of risk as well)
  - As a result, scientists, agency officials, interest groups, and the public may disagree on the nature of problems and associated management actions.
  - Need to develop low-cost mechanisms to facilitate communication, make decisions, and resolve conflicts between scientists, agency officials, interest groups and the public in order to minimize information asymmetries.
- Not unusual to find that scientists are often reluctant to participate in the selection stage of the policy process
  - It invariably involves compromise, bargaining, and the incorporation of ideological and irrational values rather than following "science"
  - Not unusual for this science to get distorted at this stage of the process

- One of the more recent developments in the world of policy analysis is that policy debates now often involve debates among competing "experts" each armed with their own information and analyses
  - As Rosenbaum (1998, 148) notes, "torturing technical data to fit some partisan position has become an art form in policy debates."
  - Common to find that each side has its own battalion of experts with advanced degrees and pedigrees that give credence to their analyses
  - Many NGOs (environmental or industry) now have their own staff of policy experts
  - Advent of the personal computer opened up world of sophisticated policy analyses – it is no longer the exclusive domain of federal agency officials
  - Debates among competing experts are often given life when there is the lack of good data or the analyses are based on debatable assumptions
    - In the absence of good data, experts are often forced to make assumptions and extrapolations that are subject to legitimate criticism
  - Expert disagreements may prolong policy conflicts and make it difficult for policymakers to make a decision, perhaps out of fear that they will soon be proven wrong when a scientific consensus emerges (e.g., global warming debate may exemplify this)
  - The potential for policy conflicts to disrupt scientific inquiry and to distort data emphasizes the importance of permitting an open, prolonged, and comprehensive scientific review of environmental policy decisions
    - Greater peer review is clearly warranted
    - Not unusual for the studies performed by partisan groups and even agency officials to lack any outside peer review process
- Remember: While science often provides important and useful guidance to decisionmakers in policy disputes, it is only one form of information that decisionmakers use when reaching a decision

Models of how science is used in the policy process

- Two solitudes model
  - Science and public policy are unrelated as to specifics but it provides a general enlightenment function in terms of policy evolution
  - Science does not lead to new policy directly, but rather indirectly as a form of policy-oriented learning.
  - Scientists are not directly involved in the policy process and the scientific basis of decisions is relatively weak
  - Generally not a good model but it does help explain how science often influences policy indirectly
- Episodic model
  - Impact of science varies in relation to the specific stage of the policy process with science and scientists actively engaged during some stages but not others
  - Scientific influence is often strong at the early stages and research findings can help provide focusing events and can help provide structure to the debate over policy options.
  - Science is weakest during the selection and implementation stages where politics tends to dominate.

  - Science reemerges during the evaluation phase as a means of examining the efficacy of policies
  - This model does a good job of explaining how science is often used in the policy process
- Active adaptive management
  - Policy interventions are designed explicitly as experiments and the power of the scientific method is used to enhance learning throughout the process of policy development and implementation
  - Scientists would be directly involved throughout the process of policy development with the results of the policy experiments determining the selection and adjustment of policies.
  - This model explains how those who favor adaptive management/ecosystem-based management view the proper role for science in the policy process
  - True policy experiments are rare for a wide range of reasons and there are practical limitations on conducting them. Thus, the model is of limited utility for explaining most environmental policies

Many scientists lack a policy orientation

- What is a policy orientation?
  - Having knowledge (or intelligence) that is directly useful in the policy process, but in addition, having knowledge of the process itself
    - It cuts across disciplines
  - It is oriented towards both the policy process and the intelligence needs of policy
    - Acquiring and balancing these two kinds of knowledge is seldom easy
  - Provides a way of thinking and acting which is different than the reductionist, positivist (i.e., descriptive) traditions of science
  - It is not the same thing as being an accomplished planner or administrator
- Why is it important to have a policy orientation?
  - Many biologists, engineers, environmental scientists experience situation where their data and opinions were discounted or ignored in decision and policy processes
    - Most environmental problems have a “political” component and this is likely to continue because of conflicting human values
  - Allows a person to better understand the overall process by mapping its interactive dynamics thereby identifying ways that you can participate more effectively
    - Allows the environmental scientists to play more roles
      - Integrator of science and knowledge
      - Specialist with detailed knowledge of an issue area
      - Mediator between knowledge specialists and administrators