BOOK REVIEW

Robert G. Fleagle: 1994, *Global Environmental Change: Interactions of Science, Policy, and Politics in the United States,* Praeger, CT, 264 pp., ISBN 0-275-94477-8.

Policy-makers face a fundamental challenge in convincing people to make painful sacrifices to address a global warming threat which may not become 'visible' for decades. The sacrifices required could be significant. At stake are some of society's most basic tenets relating to, as Paul Kennedy recently observed, "issues of wealth creation and distribution, of immediate gratification versus long-term gain, of traditional assumptions and modes of living versus newer realities, [and] of international cooperation in place of independent isolationist policies."* Even with complete scientific consensus on the scope, magnitude, and timing of the threat, it would still be difficult to convince the public to make difficult changes because of the immense economic, political, and emotional stakes involved in dramatically altering the *status quo*. Of course, it is these stakes, and the politics they manifest, interacting with science, that are at the heart of the global warming 'debate'.

Until recently, few educational institutions have offered curriculum designed to help students understand the dynamic process by which science interacts with policy-making, even though understanding this process is a prerequisite for intelligent responses to an increasing number of global and national problems, including global warming. Robert G. Fleagle's book, *Global Environmental Change, Interactions of Science, Policy, and Politics in the United States*, is one of a number of recent attempts to help further our understanding of the science and policy nexus. Dr. Fleagle sets-out an ambitious task for himself in proposing to elaborate the interactions between science and policy, to make these interactions "clearer and more complete, and to extract from the analysis a prescription for actions needed to deal effectively with global environmental change in the future." (p. 9). Not surprisingly, he is only partially successful. He has given us a book that summarizes the state of the science of global change, provides some useful history, and outlines the various political and scientific institutions and actors involved in the debate, but ultimately fails to break new ground on the question of how to achieve more effective science and policy interactions.

The first three chapters of the book are intended as background information for the relatively unsophisticated reader. Chapter one presents some useful history of the role of the President's Science Advisor in the post-war years and of rising public

* Paul Kennedy: 1993, *Preparing for the Twenty-First Century*, Random House, NY, p. 118.

concern over environmental problems in general and global change in particular. Unfortunately, interspersed throughout this chapter, as elsewhere in the book, are statements that students of policy-making in particular will find frustratingly self-evident. For example, at one point the author notes that "responses to global environmental problems will be temporary at best, and more likely futile, unless the problems of world population and economic development are addressed at the same time as the environmental problems." Clearly this is correct, but the devil is in the detail. *How* do we address these problems holistically? What are the institutional barriers to addressing them and how do we overcome those barriers? It is in answering questions such as these that the author could have contributed most to improving our understanding of the connections between science and policy-making.

Chapter two of the book is a summation of the evidence for global change. It touches on the usual data sources – such as the Maun Loa carbon dioxide observations – to present the case for anthropogenic warming. Also included is a description of the evidence for ozone depletion and for other environmental changes on a global scale. Although the chapter is well-written and fairly concise, one wonders whether this scientific evidence – which has been well-documented in numerous other places – needs to occupy an entire chapter of the book. It would have been much better, perhaps, to distill the information in it and in chapters three and four (which deal with uncertainties of climate modeling and the potential effects of global warming, both of which are also well-documented elsewhere), into one chapter.

Chapter four of the book, "Policy Implications for the United States", deserves particular comment because it reveals some confusion about what constitutes 'policy'. The chapter is actually a description of the potential *impacts* of global warming, such as sea level rise and disruptions to ecosystems, and only superficially the policy implications of these impacts. For example, after noting that sea level rise will be felt by individual property owners, marine businesses, and fisheries, among others, the author concludes, "Each of these groups will need to analyze the consequences of sea level rise for their interests, to be alert to new understanding as it develops, and to take actions to minimize adverse effects at reasonable cost." This rather self-evident observation is hardly a useful policy implication to draw about such an important potential impact of climate change. Again, the devil (and many of the interesting policy insights) is in the detail.

After providing this background on the scientific evidence, the limitations and projections of the climate models, and the potential impacts of global warming, the author proceeds in Chapters 5 through 9 to describe the various actors involved in the science and politics of global warming: The academic and professional sectors, the government sector, the grass roots, and the international actors. While his descriptions of these various actors is interesting, his treatment has three principle shortcomings. First, by describing each of these actors individually, he misses the opportunity to highlight the ways they interact in the development of global

warming policy. It might have been more illuminating to focus in depth on an environmental case study (such as ozone depletion) tailored to highlight the roles played by these various actors and their interactions.

Second, the author's short treatment of two key actors, industry and the press, does an injustice to the important part they play in the debate. The former receives just two paragraphs of text, the latter three (in contrast to the three-page description provided of the National Center for Atmospheric Research). The U.S. private sector plays a key role in the evolution of U.S. climate change policy. Much of the opposition to vigorous measures to combat global warming comes from the private sector or from those who fear that government policies will restrain U.S. economic growth. This was demonstrated most vividly early in the Clinton Administration during the debate over the carbon tax. The press is similarly important. It is the primary means scientific and technical information relating to global warming is transmitted to the public. It plays an essential role in framing the policy debate and its structural requirements for 'soundbites', sensationalism, and the appearance of balance, point to much that seems dysfunctional about the science/policy nexus.

Third, at times it is unclear if the author is writing about the role of politics in the funding and functioning of science for global warming, or about the use of global warming science in the formulation of public policy. The distinction is important. Much of his description of the evolution of institutions, such as the NSF, relates to the role political events like Sputnik had on budgets and programs, rather than on the role the Foundation plays in the global warming policy debate. The history is useful and interesting as background information, but does not directly contribute to the stated primary goal of the book.

In the final chapter, the author provides his recommendations for improving the connections between science and policy-making. Among other things, he suggests strengthening the scientific and technical capacity for policy decisions within two institutions: The Office of the President and the State Department. With regard to the former, he calls for the establishment of a part-time presidential scientific advisory committee comprised of eminent scientists. However, as the author himself has pointed out in an earlier chapter, Presidents do not always care to utilize scientific advice. Presidents Johnson and Nixon, for example, rarely involved their science advisors in major policy decisions. Presidents who do consider scientific input important in the formulation of public policy are likely to seek out scientific advice on an *ad hoc* basis anyway, as has been the case in the Clinton White House. So this recommendation is most important to implement precisely when it is least likely to be implemented. With regard to the State Department, the author proposes establishing a science advisor to the Secretary of State, enhancing the scientific and technical capabilities of the Department by reorganizing its Bureau of Oceans and International Environmental and Scientific Affairs (although he does not specify how it should be reorganized), and increasing the Department's recruitment of foreign service officers with backgrounds in science and engineering.

The author's most far-reaching recommendation is for the establishment of a lead agency for U.S. global change observations and research. He proposes four alternative ways to accomplish this: Make the National Oceanic and Atmospheric Administration (NOAA) an independent agency through a Presidential executive order and include within it NASA's Earth Observing System (EOS); prepare congressional legislation proposing the consolidation of NOAA and all of NASA within a single new agency; propose legislation creating a department of natural resources, combining NOAA, NASA's EOS components, the U.S. Geological Survey and other parts of the Department of the Interior; or establish a new department of the environment, by combining the Environmental Protection Agency, NOAA, NASA's EOS, and the U.S. Geological Survey. These are all intriguing possibilities, but the author has not really explained precisely what problem the country would be fixing by implementing any of these options, beyond hinting that a new lead-agency would be more successful in Congressional budget battles. For example, would the coordination of research be any more effective than it is now within the President's newly established National Science and Technology Council (of which the U.S. Global Change Research Program is a part)? If so, why?

There are many good arguments in support of the establishment of a lead agency for environmental affairs (indeed, discussions have recently occurred in Congress about creating a National Institute for the Environment), but few of them are presented in this book, making it difficult for the reader to assess the value of these proposals. Perhaps most important, Dr. Fleagle does not explain how this major proposal will improve the interactions between science and policy-making. At the beginning of the book, he proposed to elaborate the interactions between science and policy and to provide prescriptions for actions needed to deal effectively with global environmental change in the future. Instead, the book provides useful background information on the science and implications of climate change, the various institutional actors involved in the policy debate, and some peripheral discussion of the politics of science. Unfortunately, the reader desiring insights into the interactions between science and policy-making will have to look elsewhere.

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