

University of Richmond

## UR Scholarship Repository

---

Honors Theses

Student Research

---

Spring 2007

### Scientific advice to the House : who has the Congressional ear?

Kristen Greenholt  
*University of Richmond*

Follow this and additional works at: <https://scholarship.richmond.edu/honors-theses>



Part of the [American Politics Commons](#)

---

#### Recommended Citation

Greenholt, Kristen, "Scientific advice to the House : who has the Congressional ear?" (2007). *Honors Theses*. 204.

<https://scholarship.richmond.edu/honors-theses/204>

This Thesis is brought to you for free and open access by the Student Research at UR Scholarship Repository. It has been accepted for inclusion in Honors Theses by an authorized administrator of UR Scholarship Repository. For more information, please contact [scholarshiprepository@richmond.edu](mailto:scholarshiprepository@richmond.edu).

**Scientific Advice to Congress: Who Has the Congressional Ear?**

This thesis was successfully defended by Kristen Greenholt on 24 April 2007 and accepted by the committee members below to meet the thesis requirement for graduation with honors in Political Science at the University of Richmond.

  
\_\_\_\_\_  
Thesis advisor – Daniel Palazzolo

  
\_\_\_\_\_  
Second reader – Gerard Gilfoyle

  
\_\_\_\_\_  
Third reader – Peter Smallwood

# Scientific Advice to the House: Who Has the Congressional Ear?

By Kristen Greenholt

Political Science Honors Thesis

2007

“Good science advice is essential to wise decision-making.”

-- John Kerry

---

**Abstract:** In 2001, President George W. Bush remarked, “Science and technology have never been more essential to the defense of the nation and the health of the economy.”<sup>1</sup> The responsibility for formulating science and technology policy primarily falls into the hands of Congress. However, since few members of Congress possess a broad base of knowledge in either science or technology, they must rely on external sources of information. I examine the sources of information on which they rely, or the question “Who has the Congressional Ear?” with regard to science and technology issues. Using the downfall of the Office of Technology Assessment (OTA) in 1995 as a point of punctuated equilibrium, according to Frank Baumgartner and Bryan Jones’ theoretical framework for political change, I examine the issues of NASA authorizations, hazardous waste (superfund), and global warming, before and after OTA, looking at the sources of information in congressional hearings on these particular issues. I found that the degree of politicization varied, depending on the issue in question. The politicization was greatest in the issue of global warming. Overall, there was a decrease in the number of witnesses per issue and an increase in the number of witnesses with a Republican affiliation.

---

---

<sup>1</sup> Remarks by President George W. Bush in Meeting with High-Tech Leaders. March 28, 2001. Available at <http://www.whitehouse.gov/news/releases/2001/03/20010328-2/html>. Taken from National Academy of Sciences, “Rising Above the Gathering Storm”, Prepublication copy February 2006, p. ES-12.

## **TABLE OF CONTENTS**

---

Chapter I: Introduction.....	3
Rise and Fall of the OTA.....	8
Punctuated Equilibrium .....	14
Chapter II: OTA and Congressional Committees.....	18
The House Committee on Science.....	21
Issues before the House Committee on Science.....	24
Case Study 1: NASA authorizations.....	27
Case Study 2: Superfund.....	29
Case Study 3: Global Warming.....	32
Chapter III: Case Studies.....	40
Types of Witnesses .....	40
Data Analysis.....	45
Witness Percentages.....	47
Research Witness Trends.....	50
Government and Interest Group Trends.....	56
Chapter IV: Conclusions.....	63
Limitations.....	65
Appendix A: Acronyms.....	69
Appendix B: Interest Group and Government Witnesses.....	72
Bibliography.....	75

## CHAPTER I: INTRODUCTION

Who has the congressional ear? The answer to this question has profound implications public policy, particularly given the complexity and pervasive applications of scientific and technological discoveries. In 1998, F. James Sensenbrenner, Jr., the chairman of the House Committee on Science, noted:

“Science and engineering provide more than the ideas for future products or the foundation for advances in manufacturing. They also provide the basis for making decisions as a society, as corporations and as individuals... For example, we turn to scientists and engineers for answers to questions such as "To what standards should cities' building codes be written?" Engineers, seismologists, geologists and materials scientists may all need to be consulted. Or, "Is the food on the dinner table safe to eat?" "Is a new drug ready for use by humans?" Epidemiologists, microbiologists and pharmacologists, among many others, must inform us (Sensenbrenner, 1998, 47).”

Global warming, nuclear weapons, anti-terrorism mechanisms, nano-technology, space exploration, and superconductivity are only a few of the many issues which demand scientific expertise. Congress also must make decisions related to medicine and health care, electronics, energy, and technology funding. The 2006 National Academies of Science (NAS) report “Rising Above the Gathering Storm” (RAGS) reminds us that the products of science and technology have made notable improvements in our daily lives over the past century: vaccines and drugs, which now prevent the outbreaks of smallpox, tuberculosis, typhoid, or cholera, lifesaving medical instrumentation, electronic communications devices, and work-saving conveniences in our homes, including electricity, sanitation, and transportation (NAS, 2006, 2: 1) . Further, RAGS points out that the “largest

economic influence is in the productivity gains that follow the adoption of new products and technologies (NAS, 2006, 2: 10).”<sup>2</sup>

If science and technology (S&T) play such an important role in the health and wellbeing of our nation, then Congress must base its policies on sound scientific advice. The House Committee on Science (formerly the Science, Space and Technology Committee) is primarily responsible for deliberating over most science issues. The Committee’s official jurisdiction gives it responsibility “over all non-defense federal scientific research and development (R&D)” and charges it to ensure “that Federal tax dollars are being spent wisely and efficiently and that America’s Federal science and technology enterprise maintains its world preeminence.”<sup>3</sup> Additionally, the Committee is responsible for proposing ways in which research and development can solve some of our nation’s most pressing problems.<sup>4</sup>

Dr. Albert Teich of the American Association for the Advancement of Science (AAAS) noted (Teich, 2006, 1), “Few Members of Congress, with the notable exception of several members of this [House Science] committee, and relatively few congressional staff, have backgrounds in science.” While Congress must make many decisions with regard to science and technology, most Congress members do not possess a broad base of knowledge in these subject areas. As a result, they have to depend on outside sources of

---

<sup>2</sup> D.J. Wilson. Is embodied technology change the result of upstream R&D? Industry-level evidence. *Review of Economic Dynamics* 5(2)(2002):342-362.

<sup>3</sup> Taken from the House Committee on Science website. Official Jurisdiction of the Committee. Last accessed 16 December 2006, <http://www.house.gov/science/committeeinfo/members/index.htm>.

<sup>4</sup> Ibid

scientific information. The House Committee on Science Report, “Unlocking our Future: Toward a New National Science Policy” notes,

“While every individual must exercise his or her own judgment in making decisions—and be willing to accept responsibility for doing so—we nevertheless must of necessity rely on decisions made by our elected officials, regulators, and the courts for decisions that affect our society. When the decisions to be made involve technical issues, decision-makers must have access to and, to a large extent rely on, the advice and counsel of the scientific and engineering community (Sensenbrenner, 1998, 47).”

Science committee chair F. James Sensenbrenner (Sensenbrenner, 1998, 48) notes, “To further complicate matters, in many cases science simply does not have all of the answers” and sometimes “different scientists may derive very different inferences from the available data.” Thus, scientific advice becomes complicated because,

“Those on both sides of the issue level charges that the other side is doing “bad” science. Each side produces its own contingent of scientists who in turn put forth conflicting interpretations of the available data, if they even agree on that. Accusations are made that the other side’s scientists “have an agenda” or are beholden to a particular stakeholder in the issue (Sensenbrenner, 1998, 48).”

The notion of “bad science” recently has become contentious across partisan lines, with the 1994 Republican takeover of majority in Congress and the subsequent changes to the congressional scientific advisory process. Chris Mooney, author of The Republican War on Science, states that the current Republican approach to science is only slightly less tainted than that of Stalinist Lysenkoism<sup>5</sup> (Mooney, 2005, 12). He argues that under Republican leadership, science and scientific fact have become increasingly used as weapons of Congress to support or validate political agendas.

---

<sup>5</sup> Lysenkoism was a campaign against genetics and geneticists which happened in the Soviet Union from the middle of the 1930s to the middle of the 1960s, centered on the figure of Trofim Denisovich Lysenko. Lysenkoism is often invoked to imply the overt subversion of science by political forces.

Mooney contends, "In recent years, the Republicans as a party have been alienating intellectuals deliberately, as a matter of taste and strategy (2005, 165)." He argues that current "abuses push the issue of science politicization to the point of crisis" (2005, 242) in which the impacts of politicized science start to have real implications for society. Sensenbrenner highlights environmental concerns as one particular example of the implications of science policy stating, "Properly managing our natural resources, ensuring clean air and clean water for every citizen, and preserving the planet for future generations are concerns shared by every American. The decisions that must be made in order to tackle these issues, however, are at times highly contentious (Mooney, 2006, 48)."

Professor Jon Peha from Carnegie Mellon University (Peha, 2006) noted, "With this kind of issue, Congress needs balanced analysis that identifies possible policy options, and pros and cons of each, without telling Congress what to do. Armed with this basic knowledge, Members of Congress can listen to stakeholders, and make their own decisions about which policy is best overall. But who can provide this background?" Dr. Peter Blair, of the National Research Committee remarks similarly, pointing out that

"James Madison or Thomas Jefferson might well have argued that a government poorly informed about science and technology issues, because such issues are often so complex and have such impact on society, is destined to make bad policy choices. Yet, today, it is becoming increasingly more difficult for anyone, or even any institution, to keep pace with the frontier of knowledge. How, then, can the Congress receive useful, relevant, informed, independent, authoritative and timely advice on the science and technology dimensions of the issues it faces?" (2006, 1)

Until the Republicans won a House majority in the 1994 congressional elections, one answer to Peha's question was the Office of Technology Assessment (OTA).



The OTA was created in 1972 to provide an unbiased source of scientific information for Congress. While the OTA was largely successful in that endeavor, it was eliminated in 1994, in what Bruce Bimber (1996, 69) calls a partisan assertion of authority. When the OTA fell, Congress lost its primary source of non-partisan information. According to Mooney (2006, 48) “getting rid of an impartial scientific source like OTA greatly facilitated the politicization of science.” Dr. Peter Blair of the National Research Council elaborates on the effects of the loss of the OTA:

“With the closure of the former Office of Technology Assessment (OTA), the latter type of analysis [elaborate on the broader context of an issue and inform the policy debate with careful and objective analysis of the policy consequences of alternative courses of action, especially those that may involve value judgments and trade-offs beyond the scope of technical analysis] as performed by a disinterested analytical organization is no longer readily accessible to the Congress and may need to be reconstructed in some way (Blair, 2006, 4).”

Yet neither the Republican attack on science, nor the claim that the fall of the OTA has removed objectivity from congressional deliberation on science has been subjected to a systematic analysis. Bruce Bimber’s study of the OTA demise does not compare the sources of information during the existence of the OTA and after the fall of the OTA. Meanwhile Mooney relies on selective examples rather than systematic analysis to support his argument. This study fills the gap between the Mooney and Bimber studies by analyzing the sources of information to the House Committee on Science before and after the fall of the OTA. This study addresses three questions. First, did the GOP takeover of the House and the subsequent demise of the OTA increase the degree of unscientific or politically biased sources of information provided to Congress? Second, did Congress lose the type of objective and unbiased information provided by the

OTA, or did some other institution serve the function previously performed by OTA? Third, did the sources of scientific information take on a distinctly Republican bent after the decline of OTA? In order to address these questions, I begin with a brief description of the OTA's history and purpose. Then I develop specific hypotheses based on a theory of punctuated equilibrium derived from Baumgartner and Jones (1993) study of agenda change.

### **The Rise and Fall of the OTA**

The Office of Technology Assessment (OTA) was created by the Technology Assessment Act of 1972 for the express purpose "to improve foresight about the consequences of policy decisions involving scientific or technological questions (Bimber, 1996, 26)." It was one of four institutions with the responsibility of giving Congress impartial and unbiased advice on science and technology. The others are the Government Accountability Office (formerly the General Accounting Office) (GAO), the Office of Budget Management (OBM), and the Congressional Research Service (CRS). These four agencies collectively became the manifestation of the idea of "experts who were on tap, not on top (Bimber, 1996, 28)." In other words, these agencies comprised a group of experts who were "on-call" to Congress at any time.

The OTA and other scientific advisory agencies attempted to bridge the natural divide between policy-makers and scientists. John Gibbons, former director of the Office of Technology Assessment (OTA) and former Science Advisor to President Clinton, observes (Golden, 1995, 415) that "practitioners of science and technology on the one hand, and law on the other remain largely ignorant of the other's mysteries—the scientist's reaction to the intricacies of policy-making parallels the politician's aversion

to the laboratories, to the uncertainties inherent in research and, sometimes, to the constraints on decision-making that are the outcome of analysis.” Dr. Alan Mazur, professor of Public Affairs at Syracuse University argues (Mazur, 1981, 82) that even “The political judgments of scientists are shaped by their social milieus, just as are those of laymen, and in this value-laden domain, the scientist has no greater claim to wisdom or objectivity than anyone else.” The OTA was designed to overcome these divides, by providing an unbiased source of scientific information. Dr. Peter Blair points out that

“Indeed, OTA was prohibited in its enabling legislation from making recommendations, so the panel was created to try to collect the views of all important stakeholders rather than to try to produce consensus recommendations (although consensus findings and conclusions were provided and viewed as important by requesting Congressional committees). Instead, the OTA project teams sought to analyze and articulate the consequences of alternative courses of action and elaborate on the context of a problem without coming to consensus recommendations on a specific course of action, which would be difficult anyway with a diverse group with points of view that prevented consensus on many controversial issues (2006, 1).”

Congress needs sources of scientific information of this kind, consisting of neutral experts (Bimber, 1996, 16) who are “more concerned with the substance of policy problems than with the impact of policy choices.” Dr. Jeffrey Stine, the curator of Engineering and Environmental History at the National Museum of American History, crystallizes this argument: “To fulfill its funding and oversight roles properly, Congress must have its own bipartisan science and technology advisory apparatus, free of agency or disciplinary bias” (Golden, 1995, 446). The OTA filled this role for Congress during its time of existence.

The OTA was a small organization which maintained a simple command structure composed of two levels: analysts and the heads of the agency (Bimber, 1996, 30),

roughly 75 percent of whom were researchers by profession (Bimber, 1996, 31). While the majority of the staff had research backgrounds, OTA officials did not conduct any assessment themselves; analysts merely acted as brokers for information generated by scientists working outside of the government (Bimber, 1996, 28). The agency was overseen by a board of directors known as the Technology Assessment Board (TAB) which was designed to be completely non-partisan. The TAB board of directors determined which studies the OTA would complete, reviewed the studies which were performed by the OTA, and maneuvered between the congressional committees in order to serve all parties equally and foster a personal clientele. OTA's information was most successfully utilized when it could be passed directly to members of Congress and staffers, through means of a person-to-person connection. Bimber (1996, 35) says "This tension, between the need for personal familiarity and for institutional neutrality and credibility was one of the most defining features of OTA as an organization." Further, only congressional committee chairs could request the creation of an OTA report, which significantly limited the size of the OTA clientele.<sup>6</sup>

Although the OTA was praised for its neutrality, the process of achieving neutrality was certainly not a pre-condition of the agency. Rather, the OTA was unique in that, contrary to most agencies which begin with a neutral basis and progress to higher degrees of politicization in order to survive, it actually began with a high degree of politicization and gradually became more neutral (Bimber, 1996, 21). In its early years, under "Rule Number 12", which gave the control of the agency staff appointments

---

<sup>6</sup> While the combination of these two factors, focused clientele and personal communication with Congress, led to praise for the OTA's effectiveness and efficiency, (Bimber, 1996, p.31) it was also one of the reasons for its downfall in 1995.

entirely over to board members, OTA found itself suffering from political appointments and strong politicization (Bimber, 1996, 54). The “key to OTA’s changed stature was its need to build and maintain for itself an internal clientele” (Bimber, 1996, 51), which was originally attempted through partisan favoritism under Director Daddario, and then successfully achieved through balanced neutrality under Peterson and Gibbons. Indeed Bimber classifies the cornerstone of OTA’s success as its “ability to separate institutional loyalty from partisanship loyalty” (Bimber, 1996, 49). Further, he states that Gibbon’s reforms and “Fourth of July Massacre,” (Bimber, 1996, 57) in which Gibbons fired 15% of his staff and began a strategy of neutrality saved the agency from extinction in the 1980’s. Neutrality became one of OTA’s defining features, as well as a defining characteristic for the other scientific advisors to Congress. The OTA found that the strategy of not making policy recommendations and instead offering “something for everyone” generated the least conflict and criticism (Bimber, 1996, 64). These characteristics were the OTA’s strength, causing it to become a model for a neutral scientific advisory agency, duplicated around the world, notably in Germany, the UK, France, and the Netherlands (Bimber, 1996, 47).

The OTA’s operations, and productivity were smaller than the other government research agencies, and its impact on policy makers was hard to quantify. In terms of productivity, the OTA annually published an average of 20 to 30 studies per year, at a cost of approximately \$1 million per study (Bimber, 1996, 33). By comparison, the CRS receives nearly ½ million requests for studies per year (Bimber, 1996, 80); meanwhile the budget of the GAO is five times that of the CBO and the CRS combined (Bimber, 1996,

88). The GAO publishes approximately 2,000 studies each year<sup>7</sup>. Further, Bimber states that one cannot cite a single bill in which OTA clearly decided the outcome (1996, 36). Rather, OTA's influence was primarily rhetorical and analytical. Furthermore (Bimber, 1996, 36), "OTA's work played a role more consistent with rational models of politics in which the utility of information derives from its capacity to reduce uncertainty." Bimber states that to see the real effects of the agency, one has to look back to when policy proposals were formulated, because (1996, 39) "once positions are determined, it's too late [for the experts to matter]." The OTA did not instruct the legislators how to vote, but rather that it helped them establish a basis for their positions (Bimber, 1996, 46).

Bimber then poses the question, if the OTA was so effective, why was it cut as a part of the congressional downsizing agenda of the 1994 elections? Observers offer two answers to this question: one institutional, the other political. First, the customary GOP answer is that the OTA was expendable; it was small, performed a specialized function, and would have few short term consequences if it was cut. Representative George E. Brown, Jr. reflected this view: he said, "OTA was a small, easily targeted agency whose elimination would have an adverse affect on Congress' long-term well-being, but would not have any direct, short term consequences for legislators' interest (Bimber, 1996, 72)." The monetary effect of cutting the OTA was minuscule; the federal government saved approximately \$20 million dollars in cutting OTA (Bimber, 1996, 71). While it performed a unique service, Bimber concluded (77), "funding for OTA was abolished not because it was so large, but because it was so tiny." Further, while few members of Congress disputed the comprehensiveness of the OTA reports, many were dissatisfied

---

<sup>7</sup> <http://www.gao.gov/about/gglance.html>

with the length of time that it took for the OTA to produce a single report, arguing that it was ineffective because of the timeframe on which it operated.

The second answer is that the OTA was cut because the new Republican majority had its own scientific agenda, and the OTA did not fit that agenda. Mooney (2005, 54) compares the OTA to Socrates, saying “He gave advice to other people. He was poisoned.” While Newt Gingrich Republicans promoted the abolition of the OTA as a ‘free market’ concept, Mooney points out that it resulted in a ‘free market’ of science expertise, where authority went to the highest bidder or the greatest power (2005, 50). Thus, Representative Brown likewise recognized the political cause of the OTA’s demise: “Let me conclude with an observation made by a former OTA employee who stated OTA’s task as being to create for Congress a ‘defense against the dumb.’ It is shameful that OTA was defenseless against a very dumb decision by Congress. In the end, OTA proved to be too smart for a new Congress that is in love with simple answers (1995, 1).” While OTA did have powerful friends in Congress, who prevented its demise briefly through controversial amendments, ultimately, they were not able to prevent its downfall.

The OTA fulfilled an important role in the scientific policy-making process. Not only was held in high regard by the majority of the legislative community for the quality of work that it put forth, but it provided a type of information and analysis which Dr. Blair asserts is no longer readily available to Congress. As Dr. Blair (2006, 4) noted, without the OTA, there is a gap in the type of information and analysis that Congress receives: “With the closure of the former Office of Technology Assessment (OTA), the latter type of analysis ... is no longer readily accessible to the Congress.” Now, without

the presence of the OTA, presumably Congress members depend more heavily on their own scientific experts, who most likely possess a stake in the policy outcome. Blair's statement leads us nicely into the overarching question of this study: To what extent did the demise of the OTA change the information that Congress receives?

### **Punctuated Equilibrium**

How can the disappearance of a research organization that serves Congress alter the sources of information received by its congressional committees? In Agendas and Instability in American Politics, Frank Baumgartner and Bryan Jones propose a theory of punctuated equilibrium in political dynamics, much like that of Nils Eldridge and Steven J. Gould (Eldridge, 1972) in evolutionary biology. In essence, their argument is that agenda change happens suddenly even in the most stable institutions. Stability is defined by a state of equilibrium in a subsystem institution, such as a congressional committee, in which "essential features would not change significantly" (Baumgartner and Jones, 1996, 13). A state of equilibrium can be disrupted, or punctuated, by political or institutional forces, and ultimately a new state of equilibrium will emerge over time. Change occurs in select "windows of opportunity," in which all the necessary preconditions align. These windows of opportunity are produced with issue redefinition and institutional change. Issue redefinition can occur when popular opinion shifts, or when a powerful enough institutional agenda re-aligns. Likewise, institutional change can be structural, or political.

The theory of punctuated equilibrium suggests that the sources of information utilized by Congress should shift, after the demise of the OTA. Though he did not use the terminology defined by Baumgartner and Jones, Mooney essentially argues that the



GOP takeover of the House and the demise of the OTA constitute a point of punctuated equilibrium with respect to science policy. Presumably, a less politicized and stable system of science policy formation was dismantled and replaced by a more politicized system with a Republican bias. Mooney suggests that, in the absence of the OTA, Republicans began relying more heavily on their own scientists for information, fostering both the idea that “truth is more likely to be found at the fringes of science than at the center” (2005, 55) and that one could “pick up the phone and call your bud” (2005, 249) for scientific information. If such an abrupt and pervasive shock took effect in 1995, then the House Committee on Science, the predominant subsystem of science policy making in Congress, would receive information from very different sources. Moreover, since Mooney claims that the Republican war on science stretches across various types of issues, from chemicals in the water to greenhouse gases in the atmosphere, presumably the change would not discriminate by issue. Bimber predicts a similar result, suggesting that the absence of a decentralized, expert advice agency leads to an eventual reliance on Congress members’ own favored scientists, consequently yielding greater politicization of scientific information (1996, 99).

In order to test these claims, therefore, we must consider the sources of information given to the House Committee on Science across a range of issues before and after the fall of the OTA. This study selects three areas of science policy (NASA authorization, superfund, and global warming) for reasons that are described in the following chapter. For now, let it suffice to clarify three hypotheses which I test by analyzing patterns in witness appearances in testimonies for hearings of the House Committee on Science for each of these three issues.

The first hypothesis, i.e. the “politicization hypothesis,” is that more witnesses that represent organizations with a bias testify to the House Committee on Science after the decline of the OTA. Politicization, as it relates to science, generally occurs when industry groups, interest groups, or partisan government officials lay specific pressure on Congress in favor of a particular policy or policy action. We can measure politicization quantitatively in this study by comparing the presence of different witness types, before and after 1995. An increase in the number of interest group witnesses and industry witnesses would suggest an increased level of politicization. The second hypothesis, the “substitute hypothesis,” predicts that the objective information provided by OTA is not substituted for by some other government research organization, like OTA. A politicized Congress that just eliminated OTA presumably would have no interest in replacing its advice with information from a similar institution. The third hypothesis, “the party hypothesis,” predicts that witnesses testifying after the OTA’s demise have a Republican bias. Thus, not only are witnesses more biased, but they present information favorable to Republican viewpoints on all issues. It is possible that the results of all three of these hypotheses could depend on the issues in question and the degree of partisan divide inherent within the issue itself. In other words, issues are privy to partisan divide are more likely to see increased politicization after the fall of the OTA. For this reason, the issues which I select are particularly beneficial, because they fall along a continuum of inherent political divide, which is clarified in chapter two.

A fair test of each hypothesis requires a clearly defined methodology for selecting cases, defining concepts, and variables and gathering data, steps that are take in Chapter two. In Chapter three, I test all three hypotheses for all three issues. The final chapter

draws several conclusions from the analysis. The ultimate aim of the thesis, again, is to evaluate the claim that the demise of OTA fundamentally altered sources of scientific information in Congress. Thus, the issue of politicization is really at the heart of this study, and the stakes are high. John Gibbons, the former director of the OTA and the Science Advisor to former President Clinton stated, "Healthy skepticism is an essential and treasured feature of scientific analysis, but the willful distortion of evidence has no place at the table of scientific enquiry" (Mooney, 2005, 59). Inaccurate or politicized science often leads to misinformed or ill-advised decisions. Chris Mooney (2005, 11) echoes this sentiment: "Science politicization threatens not just our public health and the environment, but the very integrity of American democracy, which relies heavily on scientific and technical expertise to function."

## **CHAPTER II: OTA AND CONGRESSIONAL COMMITTEES**

This chapter lays the essential groundwork for a close analysis of politicization on the House Committee on Science after the demise of the OTA. I begin with a comprehensive review of the OTA's input into congressional committee deliberations, including witness testimony from OTA officials and OTA reports. The data illustrate OTA's broad presence on Capitol Hill from its origins in 1972 to its demise in 1995. The OTA studied so many different issues and testified before so many different committees that a comprehensive analysis of the OTA's input into congressional deliberations is virtually impossible. Thus, my study focuses on a few issues handled by one major committee. The House Committee on Science is the primary deliberative body to receive OTA's expertise, though the frequency of OTA's advice to the committee varied by policy issue. After applying several criteria for selecting case studies for analyzing the effect of OTA as a source of science information, I explain why I chose NASA authorization, Superfund, and global warming for further analysis. Each issue received the attention of the committee both before and after the OTA was abolished and taken together the three issues provide a reasonably good blend of topics to study the extent to which the GOP politicized science after OTA disappeared from the scene.

### **Overview of the OTA Activity**

On the verge of its abolition from Congress, OTA's proponents praised the agencies contributions to congressional deliberation. Senator Ted Kennedy (D-MA) stated,

“Since its inception in 1972, OTA has served as the scientific arm of Congress. In the effort to spend the dollars more wisely, it seems to me that OTA is more critical today than ever before. OTA helps Congress determine what projects should be undertaken, streamlined and made more

effective. It is often said that knowledge is power. Having the right information, the right knowledge, will allow us to better be able to make the right decisions. In this case, OTA provides us with the knowledge, gives us the power (Kennedy, 1995, 1).”

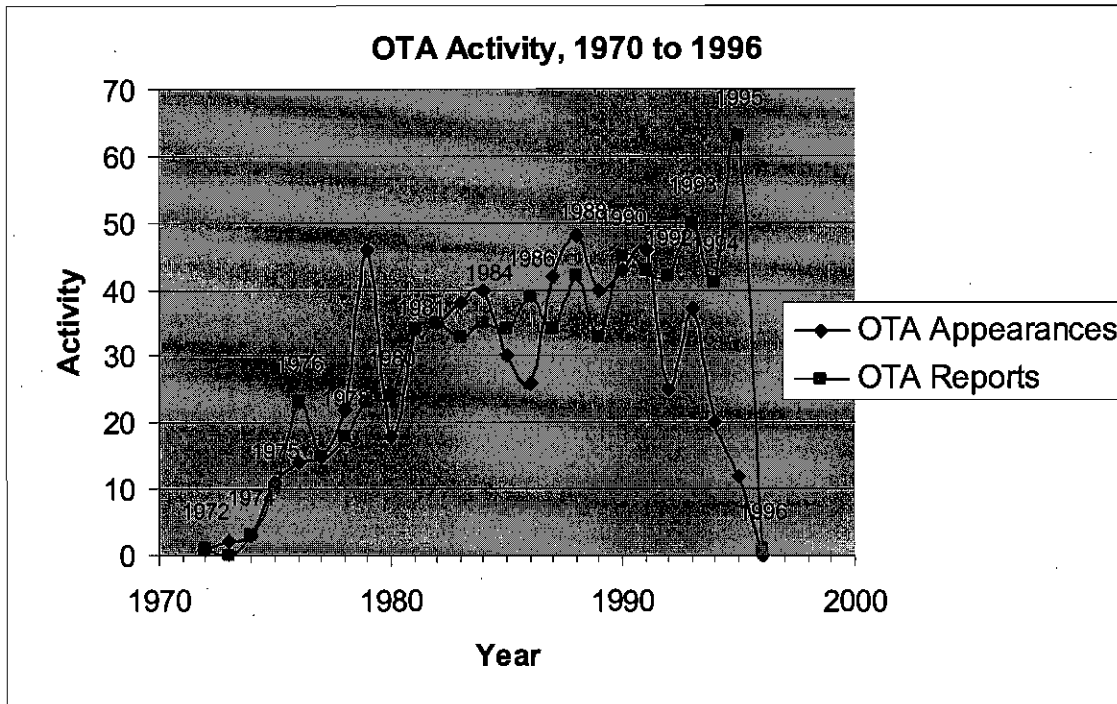
Representative Connie Morella (R-MD) stated,

“OTA’s reports have led to important cost-saving innovations for our agencies as well. OTA’s continued existence is critical to our resolution of complicated policy questions through an objective analysis of difficult issues (Morella, 1995, 1).”

From 1972 to 1995, the OTA published 721 reports on a wide variety of subjects, and OTA officials appeared as witnesses in congressional hearings 639 times. The OTA’s participation in congressional deliberations increased over its 20 year life-span (see Figure 1). As was mentioned in Chapter I, the year 1980 represented a critical turning point for the OTA, after which the agency became a more frequent presence on Capitol Hill. The 1980 transformation in the OTA’s congressional role correlates with some of the upheavals and changes which OTA director John H. Gibbons made to save the agency from downfall. During that same year, the OTA provided significant scientific advice to Congress on controversial issues such as the 1980 Energy Security Act, the Clean Air Act, the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA or Superfund), and the Foreign Assistance Act (Houghton, 1995). In hearing before the House Committee on Science on July 25, 2006, Representative Rush Holt (D-NJ) commented,

“Although the OTA had its detractors, the OTA was a part of the Legislative Branch of the U.S. Government and existed to serve the Congress in one manner: scientific and technical advice for Congress. The OTA was able to elaborate on the broader context of an issue and inform the policy debate with assiduous and objective analysis of the policy consequences of alternative courses of action (Holt, 2006, 1).”

Figure 1: OTA Activity (Witness Appearances and Published Reports), 1972 to 1996



\*\* Data labels are above the points which they reference

The data reveal a relationship between the number of OTA reports and the number of the OTA witness appearances before 1994. The average number of OTA witness appearances per year is approximately 26, with a standard deviation of approximately 15. Based on this analysis, we begin to see the decline in the OTA appearances in 1994, with the relationship ending in 1995 when the OTA makes more reports to Congress than ever before, but the number of hearings drops to the lowest levels since the late 1970s. By 1996 the OTA disappears as a source of information to Congress. The reports published by the OTA in 1995 most likely were requested during the 103<sup>rd</sup> Congress, as reports generally were published within one to two years of request. The decline of OTA witnesses before the House Committee on Science is not surprising, since Robert Walker (R-PA) replaced George E. Brown (D-CA) as Chair after the GOP took control of the House in 1995. A long standing OTA advocate, Brown was

an industrial physicist, and was remembered upon his death as not only “a strong advocate for federal R&D, he was also someone who attempted to look beyond the conventional wisdom and challenge traditional thinking about science and technology and their role in society (NPACI, 1999, 1).” Walker, an educator and Political Scientist by degree, had a negative view of the OTA, stating in 2001, “Its [OTA’s] client was Congress, and that client was not satisfied that it was getting the information it needed when the need existed. And so, in 1995, Congress decided to look elsewhere for advice and counsel on matters relating to S&T (Walker, 2001).” Walker would have been the chairman formally inviting witnesses during the 104<sup>th</sup> Congress (1995-96). The decreased number of the OTA witness appearances correlates to our expectation that the GOP majority in Congress would call fewer OTA witnesses. While the OTA published an increased number of reports in 1995, they were not utilized in Congress.

### **The House Committee on Science**

Between 1972 and 1995, the OTA testified before twenty-eight House committees, two joint committees, and twenty Senate committees, proving its broad presence as a source of scientific information for Congress. The OTA testified in hearings on a wide variety of issues, from oversight and budget renewal hearings to hearings on robotics, telecommunications, satellites, and USSR-US relations. The OTA’s advice fostered debate and discussion from both sides of the issue. In an article in the New York Times, September 24<sup>th</sup>, 1995, Warren E. Leary stated, “During floor debates, the agency’s reports were often quoted by both sides of an issue, supporters say, indicating that the agency was doing its job of supplying factual material to elevate the discussion (Leary, 1995, 26).”

The OTA appeared more times on the House Committee on Science than any other committee in the Congress. Of the 639 appearances before congressional committees, the OTA appeared before the House Committee on Science 129 times. In general, the OTA appeared in front of House committees more often than Senate Committees, with 416 House appearances and 213 Senate appearances, and 10 joint committee appearances (see Table 1). The House Committee on Energy and Commerce and the House and Senate appropriations committees also called upon the OTA's expertise quite often, though not nearly as much as the House Committee on Science. Moreover, the Energy and Commerce agenda was quite narrowly focused on energy related issues and the appropriators mainly conducted oversight into expenditures.<sup>8</sup>

Table 1: OTA Appearances in Congressional Hearings  
by Committee and Chamber: 1972-1995

<b>Committee</b>	<b>House</b>	<b>Senate</b>
(Human Resources)	0	1
(Indian Affairs, Select)	0	5
Aging, Select. (Aging)	1	3
Agriculture (Agriculture, Nutrition, and Forestry)	13	6
Appropriations	45	36
Armed Services	8	6
Banking, Finance, and Urban Affairs (Banking, Housing, and Urban Affairs)	13	6
Budget	6	2
Children, Youth, and Families, Select	2	0
Commerce	2	0
Education and Labor (Labor and Human Resources)	9	13
Energy and Commerce (Energy and Natural Resources)	50	30
Government Operations (Government Affairs)	26	18
Government Reform	1	0
House Administration (Rules and Administration)	3	2
Hunger, Select	1	0
Intelligence, Select	1	0

<sup>8</sup> Subsequent analysis shows that the majority of hearings before the Appropriations Committees can be classified as purely fiscal requests, in which the OTA provided background on a particular budgetary issue. The House Committee on Energy and Commerce is narrowly focused on issues pertaining to US energy policy, public health, and foreign and domestic trade. While the categories of "energy" and "commerce" are certainly relevant issues of science policy, they do not encompass a broad range of the issues which are pertinent to science policy.



Interior and Insular Affairs (Interior)	11	2
Interstate and Foreign Commerce (Foreign Relations)	18	7
Judiciary	13	6
Merchant Marine and Fisheries	8	0
Natural Resources (Environment and Public Works)	1	22
Outer Continental Shelf, Ad Hoc Select	2	0
Post Office and Civil Service	8	0
Public Works and Transportation (Public Works)	14	1
Science, Space, and Technology (Commerce, Science and Transportation)	129	28
Small Business	11	0
Unknown Committee	2	0
Veterans' Affairs	9	7
Ways and Means (Finance)	9	12
<b>TOTAL</b>	<b>416</b>	<b>213</b>

\* Titles for Senate committees with corresponding jurisdictions but different titles than House committees are in parentheses

Note: The OTA also appeared before two joint committees: Joint Economic Committee (8 times) and the Committee on the Organization of Congress (2 times).

The House Committee on Science, with its broad jurisdiction over all issues of science and technology, is the best institution to analyze for a study interested in the degree of politicization in science in the wake of the OTA. The House Committee on Science (formerly the Science, Space and Technology Committee) is responsible for facilitating much of the legislative debate with regard to science and technology policy. Its official jurisdiction gives it responsibility “over all non-defense federal scientific research and development (R&D)” and charges it to ensure “that Federal tax dollars are being spent wisely and efficiently and that America's Federal science and technology enterprise maintains its world preeminence.”<sup>9</sup> Additionally, the Committee is responsible for proposing ways in which research and development can solve some of our nation's most pressing problems.<sup>10</sup> The specific focus on science and technology, yet broad

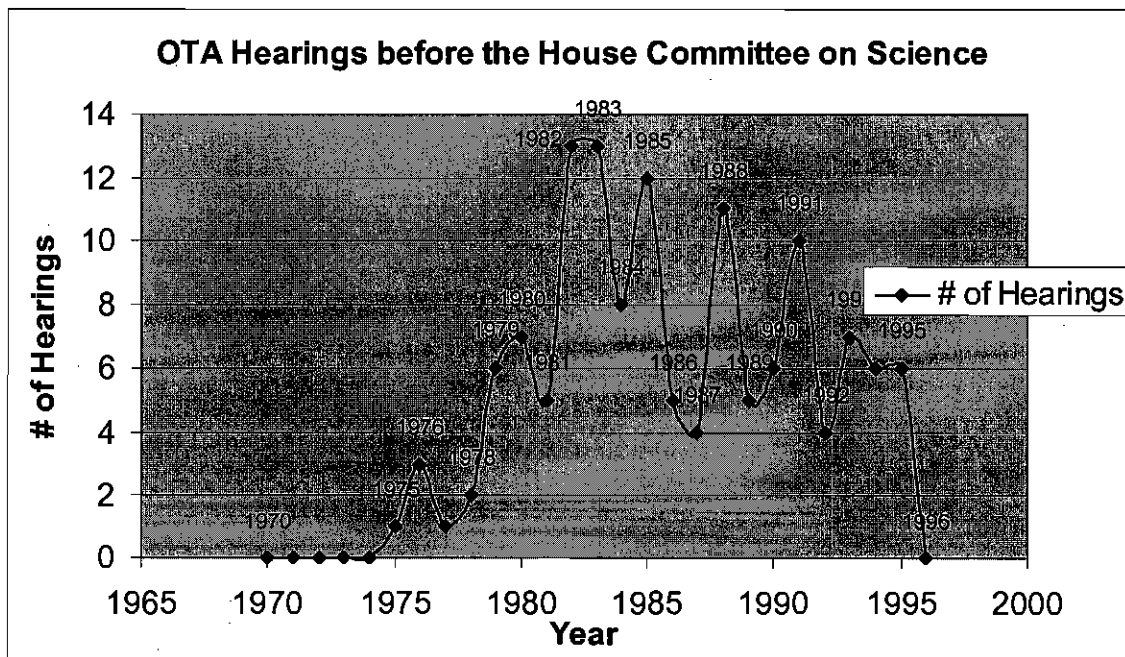
<sup>9</sup> Taken from the House Committee on Science website, accessed 16 December 2006, Official Jurisdiction of the Committee, <http://www.house.gov/science/ecommitteeinfo/members/index.htm>.

<sup>10</sup> Ibid

jurisdiction over all issues pertaining to science and technology, makes the House Committee on Science an appropriate committee to test my hypotheses.

As Figure 2, shows, the OTA appeared most often before this committee in the 1980s and early 1990s. The number of OTA hearings appears to oscillate between five and ten appearances per year during the ten year period before its downfall. The average number of OTA hearings is approximate five per year, with a standard deviation of four. The final substantive data point represents the year 1996, in which OTA produced its final report, and appeared before six hearings in the Science Committee. Of course, the OTA completely disappeared from the congressional scene on September 30<sup>th</sup>, 1995.

Figure 2: OTA appearances before the House Committee on Science, 1970 to 1995



### Issues before the House Committee on Science

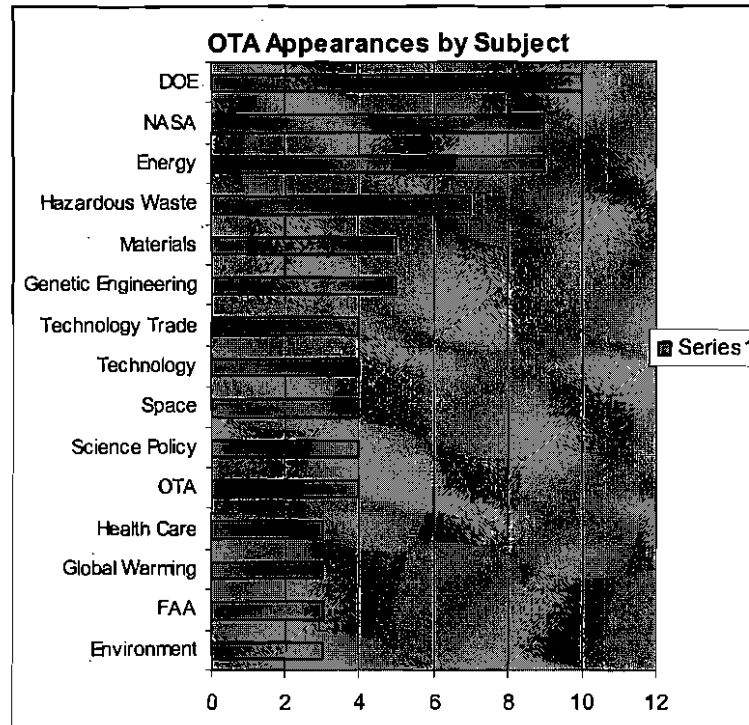
The OTA demonstrated significant presence on the House Committee on Science on numerous issues ranging from animal testing standards to health care, to DOE budget and program reauthorization, to global warming and energy policies. Figure 3

demonstrates the subjects on which the OTA testified most frequently (3 or more appearances) before the House Committee on Science. I selected three issues: NASA, Superfund (part of hazardous waste) and global warming.<sup>11</sup> I based my selection on the consistency of the issue, before and after the fall of the OTA, the current relevance of the issue, and the OTA's presence on the issue. The issues range on a political spectrum from politically neutral in the case of NASA, to politically divided in the case of global warming. Superfund falls in the middle of the spectrum. Mooney hypothesizes that the politicization of science is comprehensive, across a wide range of issues. However, it is distinctly possible that the inherent political divide on the issues might affect the external politicization of the witness testimony.

---

<sup>11</sup> Since the OTA testified more on DOE issues than any other issue, I considered using DOE for this study. Most DOE hearings pertained to a DOE budget renewal and OTA witnesses spoke about the degree of efficiency or lack thereof of the in DOE programs. Six out of the nine OTA appearances on the DOE are fiscal year DOE authorizations. While the terminology by which the congressional hearings are entitled changes in 1992 from "DOE Authorization" to "DOE Budget Authorization," the content is, for all practical purposes, the same. The issues surrounding the DOE Budget authorization are roughly similar each year. However, the OTA does not testify in every hearing on DOE authorization during the years between 1985 and 1995, and in fact, does not even testify in a large portion of the hearings on DOE authorization. The OTA testifies in six out of the sixty-five hearings (slightly less than 10 percent) on this subject before the House Committee on Science between the years of 1985 and 1995. While in every other way, this issue would be ripe for consideration, the OTA's limited presence in these hearings makes it difficult to draw any conclusions about the politicization of scientific advice which directly link to the demise of OTA.

Figure 3: OTA Appearances before the House Committee on Science, by Subject, between 1972 and 1995



I collect data from a standard time interval of ten years before the demise of the OTA (Jan. 1985-Sept. 1995) and ten years after the downfall of the OTA (Sept. 1995-Dec. 2005)

### Case Study 1: NASA Authorizations

NASA authorizations are the second most frequently addressed subject on which the OTA testifies before the Science Committee. Ideally, congressional testimony on this issue should remain unaffected by the fall of the OTA. There is very little motivation for “twisting” the science; therefore, the witnesses’ testimonies and the types of witnesses should not be significantly altered in the presence of a GOP majority. In 1958, Congress passed the National

Aeronautics and Space Act<sup>12</sup>, authorizing the creation of the National Aeronautics and Space Administration (NASA). Section 102 of the Act lays out the goals and objectives of the agency, stating,

- (a) The Congress hereby declares that it is the policy of the United States that activities in space should be devoted to peaceful purposes for the benefit of all mankind.
- (b) The Congress declares that the general welfare and security of the United States require that adequate provision be made for aeronautical and space activities (NAS Act, 1958, Sec. 102).

The act further specifies the responsibilities and functions of the agency in section 202 as,

“(1) plan, direct, and conduct aeronautical and space activities; (2) arrange for participation by the scientific community in planning scientific measurements and observations to be made through use of aeronautical and space vehicles, and conduct or arrange for the conduct of such measurements and observations; (3) provide for the widest practicable and appropriate dissemination of information concerning its activities and the results thereof; (4) seek and encourage, to the maximum extent possible, the fullest commercial use of space; and (5) encourage and provide for Federal Government use of commercially provided space services and hardware, consistent with the requirements of the Federal Government.”

More important to this case study on NASA authorizations, the 1958 Act specifies in section 310:

“Notwithstanding any other provision of law, the authorization of any appropriation to the Administration shall expire (unless an earlier expiration is specifically provided) at the close of the third fiscal year following the fiscal year in which the authorization was enacted, to the extent that such appropriation has not theretofore actually been made.”

Further, section 206 requires that the NASA Director report to Congress once a year with “a comprehensive description of the programmed activities and the accomplishments” and “an evaluation of such activities and accomplishments in terms of the attainment of, or the failure to attain, the objectives described in section 102(c) of this

---

<sup>12</sup> The National Aeronautics and Space Act, Pub. L. No. 85 568, 72 Stat. 426 438 (July. 29, 1958), As Amended. Accessed from the web, 21 March 2007, [http://www.nasa.gov/offices/ogc/about/space\\_act1.html](http://www.nasa.gov/offices/ogc/about/space_act1.html)

Act.”<sup>13</sup> This legislation sets the stage for the annual or semi-annual reports that I am studying. In essence, each hearing represents the testimony of the director of NASA to Congress on the previous year, and his or her request for funding in support of anticipated programs for the coming year. He or she seeks to validate the work that NASA has done and demonstrate that NASA’s endeavors deserve to be funded in the upcoming year.

The majority of the OTA testimonies on NASA are focused on NASA authorization hearings. In this case, the OTA testifies on four out of twenty-one hearings (slightly less than 20 percent) on NASA authorization between 1985 and 1995. The OTA also authored 21 reports on the subject of Space and Space Exploration, with four specifically focused on NASA policies. NASA budgets are eligible for re-evaluation every year. Further, NASA continued to play an important role in the development and research surrounding space exploration and earth sciences after 1995. Lisa J. Porter, the Associate Administrator of the Aeronautics Research Mission Directorate at NASA stated in September 2006,

“Today, NASA's aeronautics research programs are positioned better than ever to provide meaningful and relevant research that is aligned with our National priorities. We are conducting high-quality, innovative, integrated research across the fundamental disciplines of aeronautics, creating revolutionary tools, concepts, and technologies that will lead to a safer, more environmentally friendly, and more efficient national air transportation system. At the same time, we are ensuring that aeronautics research and critical core competencies continue to play a vital role in support of the Vision for Space Exploration. Lastly, NASA's refocused aeronautics program is establishing strong partnerships with academia, industry and other Government agencies, and in doing so, we are ensuring that our world-class resources are readily available to them.”<sup>14</sup>

---

<sup>13</sup> *ibid*

<sup>14</sup> Lisa J. Porter, Testimony before the House Committee on Science, Space and Aeronautics Subcommittee, September 26, 2006

Thus, NASA authorizations are a good case for this study: the hearing issues are constant over time, the OTA has a significant presence on the issue, before the House Committee on Science, and the case maintains significance before the Science Committee after the demise of the OTA.

There are twenty-six hearings on NASA Authorization which I consider in this statistical analysis, fifteen of which are Volume II hearings.<sup>15</sup> The Volume I and Volume II hearings are similar in content; the second volume is merely a continuation of the hearing in the previous volume. NASA authorization is the least politically charged issue that I analyzed. The case represents the baseline for my analysis because I can apply the controls most effectively: the hearings are on the same issues, every year; the witnesses are very similar in affiliation and type; there is very little inherent political leaning in the issue itself; and the House Committee on Science hears most of testimonies on this issue.

### **Case Study 2: Superfund**

The third and fourth issues in which the OTA presents significant testimony before the House Committee on Science are issues of energy and hazardous waste. While both would be beneficial to study, the issue of energy is far too broad to focus a case study effectively: there is not a well-defined, narrow area of energy policy which lends itself to a carefully focused and systematic study of the OTA. In general, OTA reports on this subject were broad, including topics such as Energy in Developing Countries and Energy Use and the US Economy. Further, the OTA is not a particularly significant witness on this issue: there are five OTA appearances on energy policy

---

<sup>15</sup> I choose to focus the analysis that I present here on the Volume II hearings because the number of witnesses in Vol. I and Vol. II hearings is vastly different, yielding significant statistical error, were I to consider both types in the same study. I selected Vol. II as opposed to Vol. I because (a) the OTA appears in Vol. II hearings, and (b) there are statistically fewer witnesses overall in Vol. I hearings, lending fewer available data points.

between 1985 and 1995, out of a total of forty-one hearings on energy policy, withstanding hearings on the Department of Energy (DOE) budget authorizations. As a result, I chose instead to center on issues broadly categorized as hazardous waste, and specifically focused on the Superfund development.

### **Background on Superfund**

The Superfund was created in 1980, under the Comprehensive Environmental Response, Compensation, and Liability (CERCLA) Act, which is more commonly known as the "Superfund".<sup>16</sup> The Superfund is a focused and narrow part of the congressional dialogue about hazardous waste, centering on environmental cleanup, specifically for organizations that cannot self-fund the necessary measures of environmental action. The Environmental Protection Agency (EPA) defines it as follows:

"Congress established a Hazardous Substance Trust Fund, referred to as "Superfund," to pay for responses by the federal government to releases of hazardous substances in cases in which there are no viable potentially responsible parties (PRPs) or the PRPs are unable to pay for the response. EPA's "enforcement first" philosophy is designed to conserve Fund monies for such circumstances. In some cases, such as emergency actions; resources of the Fund are used to conduct cleanup, after which EPA pursues cost recovery from the responsible parties. The term "Superfund" is also often used to refer to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), the law that created the Superfund cleanup program."<sup>17</sup>

The Department of Energy Office of Health, Safety, and Security summarized the CERCLA Act as follows:

Under CERCLA Congress gave the federal government broad authority to regulate hazardous substances, to respond to hazardous substance emergencies, and to develop long-term solutions for the Nation's most serious hazardous waste problems. CERCLA also created a \$1.6 billion

---

<sup>16</sup> Last Accessed April 3, 2007. <http://www.epa.gov/superfund/action/law/cercla.htm>

<sup>17</sup> EPA Questions and Answers, taken from the web 2 March 2007, <http://www.epa.gov/compliance/resources/faqs/cleanup/superfund/gen-faqs.html>



Hazardous Substance Response Trust Fund. This fund, supported by an excise tax on feedstock chemicals and petroleum, was used to pay for cleanup activities at abandoned waste sites. The 1980 law requires the parties responsible for the contamination to conduct or pay for the cleanup. If the Environmental Protection Agency's (EPA's) efforts to take an enforcement action for the cleanup are not successful, the federal government can clean up a site using the CERCLA Trust Fund. If the Superfund program conducts the cleanup, the government can take court action against responsible parties to recover up to three times the cleanup costs.<sup>18</sup>

The National Contingency Plan (NCP) [40 *Code of Federal Regulations* [CFR] part 300]<sup>19</sup> guides the CERCLA response efforts, outlining two basic responses: removal action and remedial action. Removal actions focus on the immediate elimination, containment, treatment, disposal, or incineration of the hazardous waste in question. Remedial actions make up the majority of Superfund efforts and center upon creating a system of longer-term, sustainable solutions. Specific actions falling in this category include preliminary analysis, site inspections, the Hazard Ranking System (HRS), the National Priorities List (NPL), a feasibility study, and the actual remedial action.<sup>20</sup>

The Superfund legislation was reauthorized in 1986 and its standards of environmental efficiency were extended to include federal government facilities as well as private industries. The act was amended again in 1992, 1994, 1997, 1999, and 2002 with increased definitions for allowable actions, specifically on federally owned facilities. While Superfund receives portions of its revenue from the Trust Fund, it depends on yearly congressional authorizations to maintain its existence, receiving roughly fifty percent of its budget from general revenues.

The OTA testified in two out of seven total hearings on Superfund, between 1985 and 1995. Hazardous waste, specifically limited to

---

<sup>18</sup> Last Accessed April 4, 2007. <http://homer.ornl.gov/nuclearsafety/nsea/oepa/laws/cercla.html>

<sup>19</sup> *ibid*

<sup>20</sup> *ibid*

Superfund issues, was the focus of four OTA reports, between 1985 and 1989. The Superfund maintains its prominence after 1995; between 1995 and 2005 there are two subsequent hearings on this subject before the Science Committee.

The OTA testifies in a significant portion (more than 20 percent) of the hearings on the Superfund prior to 1995.

The majority of the Superfund hearings which I consider focus on Research and Development (R&D) issues (7 out of 14 hearings), authorization of funding (2 out of 14 hearings), or specific cleanup issues (5 out of 14 hearings). Superfund is slightly more politically contentious than the NASA Authorization hearings because the issues are more environmentally sensitive, and span a wider range of actions than reviewing authorizations. The issues and technology remain relatively constant over the 20 year period. In comparison to the NASA authorizations, the Superfund legislation has a leftward leaning and contains a wider range of content. This case provides a good study of the OTA's presence before Congress because the OTA has played a significant historic role in the development of Superfund Policy.

The Superfund is another good case study because the issue is addressed directly by the OTA and remains relevant even after the OTA disappears. Further, the OTA testifies in a significant portion (more than 20 percent) of the hearings on the Superfund prior to 1995.

### **Case Study 3: Global Warming**

The issue of global warming often seems like it is over-emphasized in discussions of politicized science. However, to a certain degree, ignoring this issue would be equivalent to overlooking the metaphorical "elephant in the room." Thus, I selected global warming as a third case study.

Chris Mooney titles his chapter on global warming “The Greatest Hoax,” calling Senator James Inhofe’s “scientific” speeches on the issue, in the words of Geophysical Fluid Dynamics Laboratory director Jerry D. Mahlman, “the kind of thing you write Monty Python skits about (Mooney, 2005, 84).” Until the end of the 20<sup>th</sup> century, there was very little consensus surrounding the issue of global warming, even in the scientific community. Even today, debate surrounding the issue is heated, particularly concerning the role of human activities in the production of greenhouse gases.

In 2001, the National Academy of the Sciences published a monumental report on the matter, stating confidently that

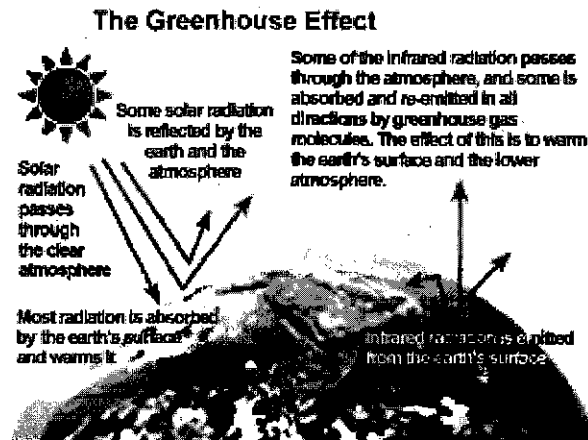
“Greenhouse gases are accumulating in Earth’s atmosphere as a result of human activities, causing surface air temperatures and subsurface ocean temperatures to rise. Temperatures are, in fact, rising. The changes observed over the last several decades are likely mostly due to human activities, but we cannot rule out that some significant part of these changes are also a reflection of natural variability. Human-induced warming and associated sea level rises are expected to continue through the 21st century (NRC, 2001, 1).”

Global warming is defined as the observed increase in the average temperature of the earth’s oceans and atmosphere. The National Oceanic and Atmospheric Administration indicated in their 2001 “State of the Climate” report (Shein, 2006, S11) that “based on the NOAA/NCDC record, the rise in global surface temperatures since 1900 is 0.66°C, when calculated as a linear trend.”

The key to understanding global warming is a basic comprehension of the greenhouse effect. The greenhouse effect has to do with the absorption and emission of solar, thermal, and infrared radiation. In essence, the amount of thermal radiation that the earth emits (upward radiation) has to be equal to the amount of solar radiation that the earth receives from the sun and the amount of infrared radiation which is reflected back

to the earth by the greenhouse gases in the atmosphere. This is based on the basic laws of physics (Conservation of Energy, Stefan-Boltzmann Law of Blackbody radiation). If for some reason, the earth merely absorbed all of the sun's radiation; it would become infinitely hot and uninhabitable. Rather, the earth absorbs the energy and then reflects about 30% of the sun's radiation back into space. Greenhouse gases, in the earth's atmosphere, trap some of the upward thermal radiation, re-emitting it back down to the earth's surface, causing the surface of the earth to heat up. The greater the concentration of greenhouse gases in the earth's atmosphere, the more the earth warms up to balance the influx of thermal and infrared radiation. The greenhouse effect is presented on the EPA website with the following diagram and explanation:<sup>21</sup>

Figure 4: Greenhouse House Effect, EPA Diagram



The Greenhouse Effect is beneficial to the inhabitants of the earth; it keeps the planet about 60 degrees Fahrenheit warmer than it would be otherwise, making the planet livable.<sup>22</sup> However, if the greenhouse gases were to increase substantially, the inhabitants of the earth might find themselves with an atmosphere similar to that of Venus, with temperatures reaching nearly 800 degrees Fahrenheit. Venus has a very

<sup>21</sup> Last Accessed April 6, 2007. <http://www.epa.gov/climatechange/science/index.html>

<sup>22</sup> Last Accessed April 6, 2007. <http://epa.gov/climatechange/kids/greenhouse.html>

thick greenhouse layer, reflecting most of the emitted thermal radiation back down to its surface, causing temperatures to rise exponentially.

The EPA notes on their website<sup>23</sup> (updated 19 October 2006) that scientists know with certainty that:

- Human activities are changing the composition of Earth's atmosphere. Increasing levels of greenhouse gases like carbon dioxide (CO<sub>2</sub>) in the atmosphere since pre-industrial times are well-documented and understood.
- The atmospheric buildup of CO<sub>2</sub> and other greenhouse gases is largely the result of human activities such as the burning of fossil fuels.
- A warming trend of about 0.7 to 1.5°F occurred during the 20th century. Warming occurred in both the Northern and Southern Hemispheres, and over the oceans (NRC, 2001).
- The major greenhouse gases emitted by human activities remain in the atmosphere for periods ranging from decades to centuries. It is therefore virtually certain that atmospheric concentrations of greenhouse gases will continue to rise over the next few decades. Increasing greenhouse gas concentrations tend to warm the planet.

Dr. Jim Hansen, one of the world's leading climate scientists, observed in 2004, that the primary cause of the global warming phenomena is human-made greenhouse gases,

“The largest change of climate forcings in recent centuries is caused by human-made greenhouse gases. Greenhouse gases in the atmosphere absorb heat radiation rather than letting it escape into space. In effect, they make the proverbial blanket thicker, returning more heat toward the ground rather than letting it escape to space. The earth then is radiating less energy to space than it absorbs from the sun. This temporary planetary energy imbalance results in the earth's gradual warming (Hansen, 2004, 71).”

The principal source of greenhouse gases comes from power processes, followed by industrial waste, and transportation fuels. Carbon dioxide is the most common greenhouse gas, with methane and nitrous oxide coming in second and third (IPCC Report, 2001). Water vapor and ozone also contribute significantly to the overall greenhouse gas concentration.

---

<sup>23</sup> Last Accessed April 6, 2007. <http://www.epa.gov/climatechange/science/stateofknowledge.html>

What scientists do *not* know is how serious the consequences of global warming will be, or how fast the temperature will change with increasing concentrations of greenhouse gases. Skeptics argue that a temperature change of less than a degree in the last century cannot have detrimental environmental impacts. Further, they argue that little is known about the seriousness of a few degrees increase in temperature. Global warming naturally raises controversy over its scientific validity, the depth of its gravity, and its potential impacts. Most policy debate surrounding the issue pertains to (a) the human role in the production of greenhouse gases, (b) the actions which should be taken against it, and (c) the validity of the science. The hearings which I consider on this issue consider similar policy debates. I look at 17 hearings on global warming, with titles such as “Nuclear Energy’s Role: Improving U.S. Energy Security and Reducing Greenhouse Gas Emissions” and “Priorities in Global Climate Change Research.” Thus, in spite of the scientific consensus on the presence and causes of global warming, uncertainty about its consequences subjects the issue to politics.

Chris Mooney terms the issue of global warming “The Greatest Hoax,” accusing Republican James Inhofe (Mooney, 2005, 78) of following a strategy of “find experts ‘sympathetic to your view’ and make them ‘part of your message.’” Further, Mooney suggests that Inhofe even goes as far as “manufacturing uncertainty” about Global Climate Change (82) and suppressing truth (95). The picture which Mooney paints of Inhofe is of a slightly deranged man, shouting “hoax” at every available moment. Mooney charges conservative scientists with having industry ties (Mooney, 2005, 87), congressmen with “stacking the bench” with their own experts (88), and the right with misinterpreting scientific fact (89). Mooney (92) states of Inhofe that he “...should not

be allowed to pick and choose which parts ... he likes or doesn't like." Mooney's criticism (2005, 101) is severe, as he states,

"If this situation is maddening, it is also tragic. There may be no other issue today where a corruption of the necessary relationship between science and political decision-making has more potentially disastrous consequences. And together, James Inhofe and the Bush administration have made that corruption systematic and complete. Not only do they strive to prevent the public from understanding the gravity of the climate situation, but in sowing confusion and uncertainty, they help prevent us from doing anything about it."

Mooney's analysis is based on the individual interactions with or actions of policymakers and the administration. He does not conduct his analysis in a systematic way; rather he shows that the GOP Congress did rely on somewhat questionable evidence for its stance on global warming. Regardless of his sources or method, if this conclusion is correct, the implications for science policy decision making are grave. The deliberate twisting of science for a given agenda is unacceptable, especially when it is done by those in political power. If Mooney is correct, then hearings on global warming should become more politicized after 1994.

The OTA appears as a witness in three out of eight hearings on global warming before the Science Committee between 1985 and 1995, and this issue is the main topic of four OTA reports, between 1991 and 1993. Global warming is subsequently addressed in the House Committee on Science in nine hearings after the demise of the OTA, between 1995 and 2005. Although global warming is not the most frequently addressed subject by OTA or the House Committee on Science, the issue is high on the list of national priorities and, to some extent, still divides the parties. President George W. Bush, in his 2007 State of the Union address recognized global warming as a "serious challenge," saying "America is on the verge of technological breakthroughs that will enable us to live

our lives less dependent on oil. And these technologies will help us be better stewards of the environment, and they will help us to confront the serious challenge of global climate change (Bush, 2007).” Yet, in spite of Bush’s recent interest in global warming, several prominent conservative Republicans dispute the scientific consensus that human activities contribute to global warming, while prominent Democrats traditionally advocate measures to reduce global warming. Global warming is quite often the issue used to demonstrate politicization of science.

The subject of global warming is by far the most controversial of the three case studies which I have selected. On a continuum ranking the degree of political divisions within my issues, global warming falls at the far left, as the most politically divided issue that I consider. It is often accused of being a left-wing issue, promoted by liberals and environmentalists, such as Al Gore (*An Inconvenient Truth*). I chose to focus on this issue as the third case study because of the accusations of its politicization. I use the analysis from the NASA and Superfund hearings to establish a model for the global warming data. I approach this controversial subject systematically, basing my analysis on the cases of NASA Authorization and Superfund so that the analysis of Global warming is as bias-free as possible.

### **Conclusion**

Because of the innately politicized nature of global warming, it serves as a critical test case for my analysis. If science policy has become more politicized on Capital Hill with the rise of the Republican majority in the House after 1994, then hearings before the House Committee on Science are likely to reflect this development. The other two case studies are less politically divided and as a result, they would be less susceptible to



politicization. The first two case studies provide a measure of the politicization and policy change which occurred as a result of the downfall of the OTA. Using this baseline, I can systematically look at the more contentious issue of global warming.

I have selected these three case studies as such because they enable me to maximize control over the variables in my study and achieve an ideal variability across the issues. By controlling for the committee and establishing case studies in which the OTA had a significant presence prior to its demise, I create a systematic method of study in which I can effectively quantify the change in the sources which Congress relies upon for scientific information. In the next chapter, I put my hypotheses to the test by analyzing the sources of information that Congress relies upon in the areas of NASA authorizations, Superfund, and global warming.

## **CHAPTER III: CASE STUDIES**

If the demise of the OTA and the emergence of a Republican majority in the House of Representatives led to a politicization of science, we should observe changes in policy deliberation on the House Committee on Science. First, the Committee would receive more of its information from politicized sources. Second, the organizations that testified from 1995 to 2005 would not substitute for the OTA's objective and unbiased information to Congress from 1972 to 1995. Third, we would see an increase in the number of organizations that endorse GOP-specific priorities. This chapter tests these hypotheses by comparing the types of witnesses which are called to testify on the House Committee on Science for NASA authorization, Superfund, and global warming before and after the demise of the OTA. This comparison allows me to characterize the change in the sources of scientific information after the fall of the OTA. The witnesses are placed in one of seven categories: academic, government, industry, interest group, laboratory, research, or other. I begin by defining these categories. Then I analyze changes in the presence of each type of witness in committee testimony for all three issues from 1985 to 2005. The data support my first and second hypothesis in one of three cases, and support the third in all three cases.

### **Types of Witnesses**

The types of witnesses to appear before the House Committee on Science can be classified in terms of seven categories: (1) Academic, (2) Laboratory, (3) Research, (4) Interest Group, (5) Industry, (6) Government, and (7) Other. I use these characterizations for all three case studies. Further, I separate the witness classifications based around the definition of "politicization" which I used to create the hypothesis in chapter I, further

expounded in this section. Though witnesses from each of the seven categories have distinct characteristics, the witness classifications of interest group and industry can be combined as “politicized” witnesses; the witness categories of academic, laboratory, and research can be combined to form “non-politicized” witnesses. Government and other witnesses are classified in a separate category. The government witnesses, in particular, are separated out because they represent a mixed degree of politicization: some of the government witnesses are political appointees, rendering them inherently politically defined; others are research scientists employed by the government. This category cannot be neatly summarized as politicized or non-politicized.

The academic category indicates an individual or organization which is affiliated with a university or college. These are individuals such as faculty of universities, professors, and members of associations of universities. An example of this classification can be seen in the case study of NASA Authorization, under witness Peter M. Banks, who is given the title of “Electrical Engineering Professor, Stanford University.” Academic witnesses are typically either professors of physics or related earth sciences. There are exceptions to this rule, however, including one political science professor (W.D. Kay) who was called as a witness in the 1997 NASA Authorization. Though academic witnesses are associated with a college or university, they speak with independent voices.

Laboratory witnesses are research scientists affiliated with national laboratories. They appear almost exclusively in the hearings on global warming. These witnesses are research scientists who are not affiliated with a university or college, but instead are part of a research collaboration at a national laboratory. Examples of this type of witness

include John T. Whetten, Associate Director of Energy and Technology at Los Alamos National Laboratory, and Charles V. Shank, the Director of Lawrence Berkeley Laboratory.

The activities surrounding the research category are the focus of this particular study. If Chris Mooney is correct and science policy is becoming less research-based, and more deeply politicized, we expect to see the most change within this category. Research-based witnesses include those who are affiliated with the four sources of congressional research science as specified by Bruce Bimber (28): the GAO, the CRS, the CBO, and the OTA. In addition, research witnesses include those from the National Academy of the Sciences (NAS), the National Research Council (NRC), or non-partisan think tanks and research institutes such as the Scripps Institute for Oceanography. Finally, academic witnesses are distinguished from research witnesses because they are not expressly linked to a congressional research service, or to an organization whose unique purpose is to provide research and information.

The academic, laboratory, and research witnesses make up the group of witnesses classified as “unbiased” or “non-politicized.” While scientists can certainly have agendas or biases, as highlighted by F. James Sensenbrenner in chapter 1, they are far less likely to be politically swayed than individuals who are either directly affiliated with a government agency, or receive their primary salaries from a group with a particular political agenda, or a corporation which has a financial stake in the decision- outcome.

Interest group witnesses are typically affiliated with advocacy groups, which focus on a specific topic or area of policy, and do not produce a good or service. Examples of this type of witness could be Steven H. Flajser, the chairman of the

Aerospace R&D Committee at the Institute of Electrical and Electronics Engineers (IEEE), and Lori B. Garver, who is the Executive Director of the National Space Society (NSS). The IEEE defines itself as, “a non-profit organization... the world's leading professional association for the advancement of technology.”<sup>24</sup> Similarly, the NSS purpose statement, says that “The National Space Society (NSS) is an independent, educational, grassroots nonprofit organization dedicated to the creation of a space-faring civilization.”<sup>25</sup> Interest groups are distinguished from research organizations in that they are narrowly focused on a specific issue or area of interest, and the information they provide reflects their particular interests. This category would also include unions and non-governmental coalitions and councils.

An industry-related witness receives a salary from an organization or corporation which produces a good or service used by or under scrutiny the individuals affiliated with the issue in question. Good examples of industry witnesses can be seen in the global warming hearings under Robert C. Berglund, the manager of the Advanced Nuclear Technology Operations at General Electric Co., and L. Daniel Mears, who is the General Manager of Gas-Cooled Reactor Associates. These are differentiated from the interest group witnesses, which do not produce a good or service and are devoted to advocacy for a particular field. More importantly, industry groups are often distinguished from the interest groups in terms of profit: industry groups make a profit; often interest groups do not.

The categories of interest group and industry are defined as the innately “politicized” witnesses. These groups may use scientific findings, but they advocate

---

<sup>24</sup> Last Accessed April 4, 2007. <http://www.ieee.org/web/aboutus/home/index.html>

<sup>25</sup> Last Accessed April 4, 2007. <http://www.nss.org/about/>

positions based on their group's concerns or their business interests. They do not provide unbiased analysis, but are generally called because they have a specific advocacy interest in the topic of debate.

The government witnesses receive their primary salary from a specific governmental agency or department. This category would include witnesses who are affiliated with NASA, the Air Force, the Defense Advanced Research Projects Agency (DARPA), the Department of Commerce, the National Institutes of Health (NIH), the Federal Aviation Administration (FAA), the Department of Defense, state and local government officials, and Representatives and Senators. This category also includes agencies such as the Office of Budget Management (OMB) and the Office of Science and Technology Policy (OSTP), whose administrators are appointed by the President.<sup>26</sup> Though OMB and OSTP are the executive parallel to Bimber's four legislative research organizations, the heads of the agency are political appointees, and their primary budget source is governmental. Thus, they are categorized as government witnesses.

Government witnesses are classified in their own separate category of politicization. A number of government officials are political appointees, such as the NASA Administrator, a position filled by President George H.W. Bush's appointee, Danjel Goldin. The heads of the OMB, OSTP, and NSF are also appointed by the President. While their appointment have to be confirmed by the Senate, the nature of their relationship to the administration in power necessitates that they are considered separately from the other witnesses. These positions are designed to be politically

---

<sup>26</sup> There are a few notable exceptions to the "Government" classification. These include the Congressional Research Service (CRS), the General Accounting Office (GAO), the Congressional Budget Office (CBO), and the Office of Technology Assessment (OTA), which Bruce Bimber characterizes as government research organizations which provide objective, independent advice to Congress (Bimber, 1996, p.28).

unbiased; however, by nature the heads of each agency are distinctly affiliated with an administration of a particular political party. Thus, government witnesses are considered separately from “politicized” and “non-politicized” categories.

Finally, the categorization of other is used to delineate sources which do not clearly fit into any other category. These anomalies include witnesses such as Richard Rhodes, a journalist and historian; Valeri A. Troitskaya, the chairman of the Scientific Council for Geomagnetism at the Soviet Academy of Sciences, USSR; or Gail Hanks, whose affiliation is “registered nurse.” This classification is somewhat of a broad “catch-all” category, designed to reduce the number of categories to a manageable number; as such, it cannot be reliably defined in terms of biased or unbiased motives. Using these categories, we can analyze the hearings on NASA authorization, Superfund, and global warming.

### **Data Analysis**

The politicization of science, as understood throughout this study, can be measured by an increase in the overall percentages of interest group and industry related witnesses before the House Committee on Science. I analyze the overall witness trends for each issue, before and after the fall of the OTA. First, I separate the types of witnesses into four categories: politicized witnesses (industry and interest groups), non-politicized witnesses (academic, laboratory, and research), government witnesses, and “other” witnesses. Then I compare the different sources to determine if scientific information has become more politicized with the fall of the OTA, demonstrated in Tables 1, 2, and 3.

Table 1: Politicization in NASA Authorizations, pre & post OTA

<b>Politicization of NASA Witnesses</b>	<b>OTA</b>	<b>Post-OTA</b>
Government	157 (58%)	40 (52%)
Non-Politicized	32 (12%)	20 (26%)
Politicized	76 (28%)	17 (22%)
Other	7 (2%)	0 (0%)
<b>Total</b>	<b>272 (100%)</b>	<b>77 (100%)</b>

- Number of Witnesses (Percentage of total witnesses)

Table 2: Politicization in Superfund, pre & post OTA

<b>Politicization of Superfund Witnesses</b>	<b>OTA</b>	<b>Post-OTA</b>
Government	54 (46%)	6 (60%)
Non-Politicized	11 (9%)	3 (30%)
Politicized	48 (40%)	1 (10%)
Other	8 (5%)	0 (0%)
<b>Total</b>	<b>119 (100%)</b>	<b>10 (100%)</b>

- Number of Witnesses (Percentage of total witnesses)

Table 3: Politicization in Global Warming, pre & post OTA

<b>Politicization of Global Warming Witnesses</b>	<b>OTA</b>	<b>POST-OTA</b>
Government	28 (27%)	25 (41%)
Non-Politicized	47 (46%)	16 (26%)
Politicized	23 (23%)	18 (30%)
Other	4 (4%)	2 (3%)
<b>Total</b>	<b>102 (100%)</b>	<b>61 (100%)</b>

- Number of Witnesses (Percentage of total witnesses)

From these data, we can state that in the cases of NASA and Superfund, the witness trends indicate a decrease in the politicization of scientific information. In the case of NASA authorizations, the decrease in politicization occurs simultaneously with a decrease in the percentage of government witnesses. In the case of Superfund, we see an increase in the percentage of government witnesses. In the case of global warming, the witness trends designate an increase in the politicization of scientific advice, as well as an increase in the percentage of government witnesses.

A second trend which emerges from the data is an overall decrease in the number of witnesses and hearings on each of these issues. In the case of NASA, the number of witnesses is reduced by a factor of four; in the case of Superfund, the number of



witnesses drops by a factor of twelve; finally, in the case of global warming, the number of witnesses is halved. The number of hearings on NASA (eleven before, four after) and Superfund (eleven before, three after) also decreases. In the case of global warming, the number of hearings actually increases after 1995 (seven before, ten after) but the number of witnesses decreases by a factor of two. This trend is striking, because it indicates that Congress is not just calling its own witnesses; it is also blatantly not calling witnesses.

Based on the results in these general categories, I infer that my initial hypothesis is only partially correct. The increase in politicization for global warming [Tables 3 and 6] is consistent with my expectations, but the witnesses for Superfund and NASA do not follow the expected trends. Yet, because so much change under NASA occurs in the government category, which may contain either biased or unbiased sources, we should take a closer look at movements within the specific categories. A more refined analysis is necessary to provide the details necessary to fully analyze the change in the politicization of science. I separate the categories of “politicized,” “non-politicized” and “government” into the seven original categories, and look more specifically at the witness affiliations and organizations which are present in the hearings.

My analysis examines three trends: (1) the percentages of witnesses by type, before and after the demise of the OTA; (2) the research-based witness trends; and (3) the particular witnesses in the government and interest group data.

### **Witness Percentages Before and After the OTA**

The first stage of analysis compares the overall percentages of witnesses by category, before the fall of the OTA and after the fall of the OTA. This stage of the analysis allows me to observe the difference in the overall percentages on both sides of

the transition year. Table 4 demonstrates the percentages per category for NASA Authorizations before 1995 in comparison to the percentages per category after 1995.

Table 4: Witness Type Trends for Vol. II NASA Authorization hearings, pre & post 1995

<b>Witness Type</b>	<b>OTA</b>	<b>POST-OTA</b>
Academic	13 (5%)	11 (14%)
Government	157 (58%)	40 (52%)
Industry	27 (10%)	5 (6%)
Interest Group	49 (18%)	12 (16%)
Laboratory	3 (1%)	0 (0%)
Other	7 (3%)	0 (0%)
Research	16 (6%)	9 (12%)
<b>Total</b>	<b>272 (100%)</b>	<b>77 (100%)</b>

- Number of Witnesses (Percentage of total witnesses)

The contrast between the percentages of witnesses during the time of the OTA and after the OTA is highlighted in Table 4. The percentage of academic witnesses triples and the number of research witnesses doubles after 1995; the percentages of government, industry, and interest group witnesses decrease slightly; and the miniscule number of laboratory witnesses disappears completely, as do those classified as “other.”

The results of superfund hearings are presented in Table 5. I apply the same form of analysis to these as to the NASA authorization hearings.

Table 5: Witness Type Trends for Superfund Hearings, pre & post 1995

<b>Witness Type</b>	<b>OTA</b>	<b>POST-OTA</b>
Academic	3 (3%)	0 (0%)
Government	54 (45%)	6 (60%)
Industry	19 (16%)	0 (0%)
Interest Group	29 (24%)	1 (10%)
Laboratory	0 (0%)	0 (0%)
Other	6 (5%)	0 (0%)
Research	8 (7%)	3 (30%)
<b>Total</b>	<b>119 (100%)</b>	<b>10 (100%)</b>

- Number of Witnesses (Percentage of total witnesses)

The data in Table 5 show that the percentage of academic, industry, and “other” witnesses disappears completely; the percentage of interest group witnesses decreases significantly, and the number of research witnesses increases substantially. The overall

percentage of government witnesses also increases. These findings are similar to those for the NASA authorizations, with the exception of the government and academic percentages, which follow opposite trend lines. The key point from this section of analysis is that both cases reflect an increase in the percentage of research based witnesses and decreases in the percentages of industry and interest group witnesses.

The overall percentage trends for global warming are shown in Table 6.

Table 6: Witness Type Trends for Global Warming, Pre & Post-1995

<b>Witness Type</b>	<b>OTA</b>	<b>POST-OTA</b>
Academic	14 (14%)	9 (15%)
Government	28 (27%)	25 (41%)
Industry	15 (15%)	2 (3%)
Interest Group	8 (8%)	16 (26%)
Laboratory	11 (11%)	0 (0%)
Other	4 (4%)	2 (3%)
Research	22 (21%)	7 (11%)
<b>Total</b>	<b>102 (100%)</b>	<b>61 (100%)</b>

- Number of Witnesses (Percentage of total witnesses)

Table 6 demonstrates that the percentage of government witnesses increased substantially, from 27% pre-1995 to 41% post-1995. Similarly, the percentages of research, industry, and “other” witnesses decreased substantially in the years following the OTA. The percentage of academic witnesses remained reasonably constant, while the percentage of laboratory witnesses disappeared entirely. The two unique trends within this data set are the increased percentage of interest group witnesses, and the decreased percentage of research-based witnesses. These trends do not mirror those observed in the NASA data or the Superfund data.

In all three cases, the percentage of industry groups, laboratory groups, and “other” witnesses decreases after 1995. The increase in the percentage of interest group witnesses for global warming is expected, but the concurrent increase in the percentage of academic witnesses is surprising. Mooney’s suggestion is that Congress recruits

academics with industry-backing, to fill this category. This claim, however, is not investigated in depth within this study.

Finally, consideration of the witness percentages across the three issues demonstrates that the general percentage of government witnesses is higher for NASA and superfund hearings. In both cases, before and after, the percentage of government witnesses is around 50 percent. In contrast, global warming hearings call roughly 30 percent of their witnesses from the government. Interest group witnesses make up between 10 and 20 percent of the witnesses for NASA and Superfund, whereas they constitute 10 percent for global warming prior to 1995 and approximately 30 percent after 1995. In other words, while the data indicate a significant change in the politicization of the global warming issue, it is not completely valid to say that global warming is more politicized than NASA or superfund. Rather, the data show that the change in politicization has been greater in the area of global warming

### **Research Witness Trends**

The third stage of analysis looks specifically at the trends within the research category. If the deliberation on the House Committee on Science became more politicized after 1995, the type of information that the OTA provided would not be replaced when the OTA disappeared from the scene. The next stage of the analysis allows me to consider whether the sources of OTA information were replaced, and if so, which source of information served as the replacement.

Table 7 demonstrates the research witnesses present for the Volume II NASA hearings, categorized by the year of the hearing. Authorization hearings operate on the

basis of a fiscal year; the hearing takes place a year before the authorization will go into effect. For example, a FY1998 hearing would take place in 1997.

Table 7: Research Witnesses by Affiliation, NASA Authorization, 1985-2005

<b>Research Witnesses Present</b>	<b>Hearing Date</b>
Congressional Budget Office (CBO) National Center for Atmospheric Research (NCAR) National Research Council (NRC) Office of Technology Assessment (OTA)	1985
National Research Council (NRC) National Academy of the Sciences (NAS)	1986
Office of Technology Assessment (OTA)	1987
None Present	1987
None Present	1989
None Present	1990
None Present	1991
National Research Council (NRC)	1992
Office of Technology Assessment (OTA)	1993
National Research Council (NRC)	1994
Congressional Budget Office (CBO) Government Accountability Office (GAO) Office of Technology Assessment (OTA)	1995
National Research Council (NRC)	1996
National Research Council (NRC)	1997
National Research Council (NRC) Potomac Institute for Policy Studies (PIPS) Congressional Research Service (CRS)	1999
National Research Council (x 3) (NRC) National Center for Geographical Information and Analysis (NCGIA) Government Accountability Office (GAO)	2000

The National Research Council (NRC) is the most frequently appearing research-based witness for NASA Authorization, appearing in eight out of fifteen authorization hearings. The NRC and the OTA each appear in four out of the eleven hearings prior to 1995. At least one of them is present in every pre-1995 hearing in which a research witness is called. Prior to 1995, the NRC and the OTA appear to share the responsibility of representing the research-based opinion in NASA Authorization hearings; neither takes preeminence. After 1995, the NRC maintains the responsibilities which it shared with the OTA prior to 1995. The Government Accountability Office (GAO) appears as a

new witness in 1995, and returns in 2000. In addition, the committee calls on PIPS and NCGIA, two non-profit research based organizations, post-1995.

The PIPS organization is particularly interesting. It makes every attempt to be non-partisan, focusing specifically on broad issues related to science and technology. PIPS identifies its purpose as:

“The Institute identifies and aggressively shepherds discussion on key science and technology issues facing our society, providing in particular, an academic forum for the study of related policy issues. From these discussions and forums, we develop meaningful science and technology policy options and ensure their implementation at the intersection of business and government.”<sup>27</sup>

The objectives of PIPS, while not as time-weathered as those of the OTA, appear remarkably similar:

“First, we fiercely maintain objectivity and credibility, remaining independent of any federal or state agency, and owing no special allegiance to any single political party or private concern. This dedication to fierce objectivity is evident in our motto, *Integrum Se Servare*. We make every attempt to ensure that our work is conducted in an unbiased manner, regardless of the opinions of sponsors, or even self-interest. This often enables fruitful inquiries into issues that might otherwise be difficult to assess. Second, we seek extensive collaboration with similar organizations, as well as with industry, academia, and government, and we work closely with Congress and the Executive Branch.”<sup>28</sup>

Stephanie L. Tennyson, of PIPS suggests that perhaps the similarities between the OTA and PIPS are not unintentional. She writes,

“The Potomac Institute for Policy Studies is an independent, 501(c) (3), not-for-profit public policy research institute founded in 1994 in the wake of the disestablishment of the Congressional Office of Technology Assessment (OTA). The Institute identifies and aggressively shepherds

---

<sup>27</sup> Last Accessed March 31, 2007. <http://www.potomac institute.org/aboutus/aboutus.htm>

<sup>28</sup> Ibid

discussion on key issues facing our society, particularly those associated with innovation (Tennyson, 2004, 3).”

The presence of PIPS, alongside the NRC and NCGIA, suggests that Congress still feels the need for an objective source of scientific information similar to the OTA. The NRC and the OTA appear to share responsibilities for a certain type of testimony, prior to 1995; after 1995, the OTA disappears, and the NRC, PIPS, and NCGIA take over the responsibility for that type of testimony.

Table 8 represents the affiliations of the research-based witnesses who were called to give testimony on issues regarding the Superfund. These hearings differ slightly from those on the NASA Authorization, because there are far fewer witnesses in each hearing. Thus, the presence of one or two research witnesses in a hearing could represent anywhere from nine percent of the total witnesses to thirty-three percent, depending on the size of the hearing.

Table 8: Research Witnesses by Affiliation, Superfund Hearings 1985-2005

<b>Research Witnesses Present</b>	<b>Hearing Date</b>
Office of Technology Assessment (OTA)	May-85
Office of Technology Assessment (OTA)	
Office of Technology Assessment (OTA)	May-85
None Present	Jun-85
None Present	Oct-85
None Present	Jan-86
Southwest Research and Information Center	Nov-87
Office of Technology Assessment (OTA)	Sep-88
None Present	Jul-89
None Present	Oct-89
Government Accountability Office (GAO)	Apr-93
Office of Technology Assessment (OTA)	
Office of Technology Assessment (OTA)	
None Present	Nov-93
Government Accountability Office (GAO)	Dec-95
Government Accountability Office (GAO)	Mar-99
Northeast Hazardous Substance Research Center (HSRC)	Oct-99

The OTA is by far the most commonly recognized research-witness on the issue of Superfund, appearing six times in four out of fourteen hearings on the subject. The GAO follows, with three appearances in three hearings. While the NASA Authorization case shows a clear relationship between the NRC and the OTA roles, Superfund is not nearly as clear cut. The GAO appears to be the closest corollary to an OTA replacement. The other research-based sources are region-specific, and appear only in hearings with regard to a particular geographic area. The Southwest Research and Information Center is a regional center, “founded in 1971 for the purpose of providing information to the public on the effects of energy development and resource exploitation on the people and their cultures, lands, water, and air of New Mexico and the Southwest.”<sup>29</sup> Likewise, the Northeast Hazardous Substance Research Center is one of five regional research centers, existing for the express purpose of bringing together “researchers from a variety of disciplines to collaborate on integrated research projects, which involve practical problems of hazardous substance management as well as long-term, exploratory research.”<sup>30</sup> In the case of NASA, there are clear replacements in the category of research in hearing testimonies post-OTA; in the case of Superfund, we can see a clear absence of the OTA after 1995 with the GAO possibly providing an alternate source of information. In other words, we see a partial substitution for the testimonies of the OTA, post-1995.

Table 9 details the presence of each research-based witness on the issue of global warming.

Table 9: Research Witnesses by Affiliation, Global Warming, 1985-2005

Research Witnesses Present	Hearing Date
----------------------------	--------------

<sup>29</sup> (Retrieved 28 March 2007): <http://www.sric.org/>

<sup>30</sup> (Retrieved 28 March 2007): <http://www.hsric.org/>



National Academy of the Sciences (NAS) National Center for Atmospheric Research (NCAR) Ill Water Survey (IWS) Scientific Research Society (SRS) World Meteorological Organization (WMO) Resources for the Future (RF) Global Atmospheric Research Program (GARP) Woods Hole Research Center (WHRC)	Sep-87
Office of Technology Assessment (OTA) Rocky Mountain Institute (RMI)	Jun-89
Electric Power Research Institute (EPRI)	Sep-89
Office of Technology Assessment (OTA) National Academy of the Sciences (NAS)	Jul-91
Solar Energy Research Institute (SERI) Office of Technology Assessment (OTA)	Jul-91
National Academy of the Sciences (NAS) Electric Power Research Institute (EPRI)	Oct-91
National Academy of the Sciences (NAS)	May-92
Government Accountability Office (GAO) Scripps Institution of Oceanography (SIO)	Aug-96
None Present	Nov-98
None Present	Nov-98
None Present	Sep-99
None Present	Sep-99
None Present	Oct-99
None Present	Oct-99
None Present	Jun-00
Nuclear Energy Institute (NEI)	Jun-01
Coal Utilization Research Council (CURC) Government Accountability Office (GAO) Nuclear Energy Institute (NEI) National Research Council (NRC)	Jul-02

The interesting point to note from this table is that the OTA does not play a significant role in testimony concerning the issue of global warming. Even before 1995, the OTA does not have much of a presence on this issue. In the years prior to 1995, the OTA appears in three out of eight hearings pertaining to global warming. It is often accompanied by the NAS. Prior to 1995, in hearings in which one of these two is not present, the research witnesses were often specifically geared toward a particular type of energy research, such as electric power, or solar energy. However, the hearings in 1991, in which the research witnesses are specifically limited to a particular field of energy

research, are general hearings on the issue of global warming. The hearings are not focused on a particular type of energy, which would necessitate witnesses explicitly focused within a specific field.

The global warming hearings following the demise of the OTA often lack research-based witnesses. There does not appear to be a specific pattern to the types of witnesses in hearings on this subject; after 1995 the GAO appears twice, and the NEI appears twice. While in the case of NASA we see a fairly clear replacement source for the OTA, this is not the case for global warming, where there is an explicit drop in the number of research witnesses. In the ten year period prior to 1995, every hearing on global warming has at least one research-based witness present. In the years after 1995, only four out of ten hearings on the subject have a research witness present. As the trends from the first and second stage of analysis indicate, the numbers of laboratory and academic witnesses are also greatly diminished. In other words, the purely research based witnesses are not being replaced by academic or laboratory witnesses. Rather, they appear to be replaced with government or interest group witnesses. This trend is the closest example of punctuated equilibrium, in which the percentage of research witness drops sharply from the GOP takeover of the House 1995 and concurrent demise of the OTA.

In sum, this portion of the analysis reveals that in the case of NASA Authorizations, the OTA had significant presence, but was replaced, upon its demise, by the NRC, NCGIA and PIPS. The need for an OTA-like agency is revealed in the presence of PIPS, after the disappearance of the OTA. This fact shows that Congress was still looking for OTA-type information, even after the agency had been removed from the

Congressional scene. In the case of Superfund, the OTA played a substantial role and appears to have been partially substituted by the GAO after 1995. Finally, in the case of global warming, the OTA does not appear to have played a substantial role, even during the years from 1985 to 1995. In the years immediately following 1995, there is a complete absence of research witnesses. Not only is the OTA not replaced, but the other research witnesses which had been present alongside the OTA also disappeared.

### **Government and Interest Group Categories**

The consideration of the research-based witnesses allows us to draw conclusions about the overall politicization of science. However, the changes which occur within the government category and the interest group category reflect changes in partisan bias. In particular, I note witness disappearances after 1995, and witness appearances in the years following 1995. A complete table of acronyms can be found in Appendix A and the complete table of the government and interest group witnesses across all three issues can be found in Appendix B.

The first trend which I discovered upon a closer analysis of the government and interest group witness data pertained to the presence of Representatives and Senators on particular hearings. Hearings for both NASA and Superfund demonstrated substantial Congress-member testimony prior to 1995. After 1995, these witnesses disappeared; Congress was not calling its own members to testify on either of these issues in the years following the OTA. Conversely, in the case of global warming, the number of Representatives and Senators offering testimony followed an inverse trend: no members testified prior to 1995 and an increased number testified after 1995. Prior to 1995, three republican and five democratic Congress members testified on NASA. There are four

democrats who testified on the issue of Superfund. In contrast, after 1995, three of the four Congress members testifying on global warming were republicans. The democrat, Joseph Lieberman (D-CT), is staunchly opposed to global warming, and is an outspoken advocate of taking action to prevent further climate change. He is, however, self-defined as an independent democrat, and often aligns with the Republican Party on policy issues. The data seem to indicate a decrease in the democratic leaning of government witnesses for NASA and Superfund and a concurrent increase in republican influence on global warming.

NASA authorization interest groups demonstrate an increased conservative leaning. In particular, we note that the American Institute of Aeronautics and Astronautics (AIAA), the Institute of Electrical and Electronics Engineers (IEEE), the National Space Society (NSS), and the American Society of Mechanical Engineers (ASME) disappear from the witness lists, and the Aerospace States Association (ASA), the United Space Alliance (USA), and the Cato Institute appear. The AIAA was established in 1963, and commits itself to “To advance the arts, sciences, and technology of aeronautics and astronautics, and to promote the professionalism of those engaged in these pursuits.”<sup>31</sup> It seeks to achieve this purpose as follows:

AIAA encourages original research ... furthers dissemination of new knowledge ... fosters the professional development of those engaged in science and engineering ... improves public understanding of aerospace and its contributions ... fosters education in engineering and science ... promotes communication among engineers, scientists, and other professional groups ... and stimulates outstanding professional accomplishments.<sup>32</sup>

---

<sup>31</sup> Last Accessed April 2, 2007. <http://www.aiaa.org/content.cfm?pageid=189>

<sup>32</sup> *ibid*

In contrast, the CATO Institute is a traditionally libertarian institution, self-defining its purpose as, “The Cato Institute seeks to broaden the parameters of public policy debate to allow consideration of the traditional American principles of limited government, individual liberty, free markets and peace.”<sup>33</sup> The IEEE “a non-profit organization, is the world's leading professional association for the advancement of technology.”<sup>34</sup>

Conversely, the ASA is “a bi-partisan representative of the grass roots of American Aerospace. It is a scientific and educational organization of Lieutenant Governors and Governor-appointed delegates.”<sup>35</sup> Thus, even within the category of interest groups, we see different trends in the types of interest groups that are called to testify on the issue of NASA Authorization. The trend indicates favoritism towards grassroots and principled organizations, as opposed to professional societies. The presence of Cato as a witness reflects the increased conservatism of the GOP majority in Congress.

The Superfund data are hard to analyze in terms of the change in interest groups. There are very few interest group witnesses present after the fall of the OTA, therefore we can only make statements about which witnesses disappear in 1995. In particular, the Hazardous Waste Treatment Council (HWTC) and Natural Resources Defense Council (NRDC) disappear. The HWTC is the primary representative for most large hazardous waste management firms.<sup>36</sup> The NRDC is a liberally slanted environmental defense organization, which is devoted to achieving the following:

“The Natural Resources Defense Council's purpose is to safeguard the Earth: its people, its plants and animals and the natural systems on which all life depends... We work to foster the fundamental right of all people to have a voice in decisions that affect their environment. We seek to break

---

<sup>33</sup> Last Accessed April 2, 2007. <http://www.cato.org/about/about.html>

<sup>34</sup> Last Accessed April 2, 2007. <http://www.ieee.org/web/aboutus/home/index.html>

<sup>35</sup> Last Accessed April 2, 2007. <http://www.aerostates.org/>

<sup>36</sup> Last Accessed April 2, 2007. <http://pwp.lincs.net/sanjour/Revolving.htm>

down the pattern of disproportionate environmental burdens borne by people of color and others who face social or economic inequities.”<sup>37</sup>

Thus, in the case of Superfund, liberal interest groups do not reappear in hearings after 1995, and, unlike NASA authorizations, are not replaced with another form of interest group. The data set is so small, however, that it is difficult to draw determinant conclusions about the politicization trends within the interest group category.

Global warming demonstrates a disappearance of the World Resources Institute (WRI), the American Society of Mechanical Engineers (ASME), the American Nuclear Energy Council (ANEC), and Gas Research Institute (GRI), and an increase in the presence of the Charles River Associates (CRA), United Mine Workers Association (UMWA), US Public Interest Research Group (USPIR), American Petroleum Institute (API), Competitive Enterprise Institute (CEI), and Council for Global Climate Change (GCC). Chris Mooney highlights the API (2005, 82), CEI (95), and GCC (81) as partisan organizations, who received substantial industry funding in support of their anti-global warming campaigns. Their presence in hearings after 1995 supports Mooney’s hypothesis that the science presented in hearings on global warming was increasingly politicized. In contrast, the WRI defines itself as “an environmental think tank that goes beyond research to find practical ways to protect the earth and improve people’s lives.”<sup>38</sup> The ANEC is a component part of the Nuclear Energy Institute (NEI), which is “... the policy organization of the nuclear energy and technologies industry and participates in both the national and global policy-making process. NEI’s objective is to ensure the formation of policies that promote the beneficial uses of nuclear energy and technologies

---

<sup>37</sup> Last Accessed April 2, 2007. <http://www.nrdc.org/about/mission.asp>

<sup>38</sup> Last Accessed April 2, 2007. <http://www.wri.org/about/>

in the United States and around the world.”<sup>39</sup> The ASME was “Founded in 1880 as the American Society of Mechanical Engineers, today's ASME is a 120,000-member professional organization focused on technical, educational and research issues of the engineering and technology community.”<sup>40</sup>

The data for global warming interest group and government witnesses seem to support both Mooney’s claims and the results of my statistical analysis. Not only do we see an increase in the overall politicization, but we also see an increase in the political leanings of the witnesses themselves, within the interest group category and the government category.

### **Summary of Chapter III**

The data presented in this chapter demonstrate an increase in the overall politicization of the issue of global warming, as well as a decrease in the politicization of the issues of NASA authorization and Superfund. Concurrently, after 1995, the numbers of “laboratory,” “industry” and “other” witnesses decreased substantially.

The data also show that the loss of the OTA did not necessarily mean of loss of objective sources of information. In the case of NASA, the OTA had a significant presence, but was replaced with the NRC, NCGIA, and PIPS upon its demise in 1995. The OTA also carried substantial weight on the issue of Superfund, and upon the congressional takeover in 1995 the GAO appears to step up to take the place of the OTA. The OTA did not have the same presence on the issue of global warming, but the data reflect an overall decrease in the number of research witnesses after 1995. Not only did the OTA disappear, but its contemporaries in the research category also disappeared.

---

<sup>39</sup> <http://www.nci.org/index.asp?catnum=2&catid=136>

<sup>40</sup> [http://www.asme.org/about/Vision\\_Mission\\_Core\\_Values.cfm](http://www.asme.org/about/Vision_Mission_Core_Values.cfm)

Finally, within the category of government witnesses we see a parallel to the overall politicization trends within each case study. Both NASA and Superfund show a decrease in the number of political representatives, while global warming shows an increase in the number of representatives and senators who are present in congressional hearings. In the interest group category, we see an overall increase in politicization, across all three issues. The witnesses that Congress called after 1995 tended to be grass-roots organizations, which were more conservatively-minded and principle-driven than those called before 1995. This trend would support Mooney's claim that there has been an overall increase in the politicization of science, following the 1995 GOP takeover of Congress.



## CHAPTER IV: CONCLUSIONS

This study began with a fundamental question involving the politicization of the scientific information received by Congress. Through the lens of my three case studies, I examined this question systematically in order to test my three hypotheses:

- The politicization hypothesis: more witnesses that represent organizations with a bias would testify to the House Committee on Science after the decline of the OTA.
- The substitution hypothesis: the objective information provided by OTA would not be substituted for by some other government research organization, like OTA.
- The party hypothesis: witnesses testifying after the OTA's demise would have a Republican bias.

In keeping with the expectations of scholars who study the role of parties in Congress, I remained open to the possibility that politicization may vary across issues. In two of the three cases, the findings show no evidence of politicization in the sources of information, and even some evidence of less politicization after OTA. In the third case, the sources became increasingly politicized. From these results, we can deduce that the degree of politicization depends on the issue being considered. Some issues, like global warming, are more divisive along party lines than others. Thus, the first hypothesis is only valid in one of the three cases.

The substitution effect also varies by issue. In the first case, the OTA sources of information were replaced with information from the NRC, PIPS, and NCGIA; in the second case, the OTA was partially replaced by the GAO; and in the third case, the OTA did not play a central role prior to 1995, but upon its demise, all sources of "research"

witness disappeared. One possibility is that the more specialized the policy issue is, the less likely one is to see substitution effects.

Finally, within the interest groups category, we see an increase in the GOP bias of the individual witness groups called to testify. Interestingly, in all three cases, the interest group witnesses reflect an ideological shift favoring conservatives after the 1995 GOP takeover. If I were to delve into the academic and industry categories as well, I would expect to see a similar trend: greater focus on grassroots, conservative principles, and a deviation from professional, politically neutral organizations or groups. This hypothesis seems to hold up across issues, and may reflect the general drift toward partisanship on the Hill. The majority party rules the House and this bias is evident even on the least partisan issue. One wonders if any other issues escape the partisan bias noted in these data. Yet, it is worth noting that OTA's fall was not necessarily a cause of the rise in GOP leaning witnesses; with or without the OTA, the GOP would have invited their allies, just as the Democrats had before them.

In returning to my initial hypothesis, I can make three statements as a result of my analysis.

- First, the politicization of the congressional sources of information depends on the nature of the hearing topic. In the case of NASA and Superfund the types of witnesses present do not seem to reflect an increased politicization. However, the case of global warming, which is politically charged, reflects an increase in politicization. Further, there is a decrease in the overall number of witnesses which are called, indicating that Congress is not only calling its own witnesses, but is also turning a silent ear to witness testimony.
- Second, the OTA had a range of influence on congressional hearings. In some cases, it was heavily relied upon; in other cases, it was merely a contributing source. As a result, its demise had differing effects on the politicization of congressional information. It would be misleading to link the overall politicization of scientific information to the demise of the OTA. My results are inconclusive: two cases show a replacement source of information filling OTA's

role, and the third reflects a non-influential OTA prior to 1995 and the disappearance of all research-based witnesses after 1995.

- Third, while the politicization of scientific information cannot be conclusively linked to the demise of the OTA, it is fair to say that the sources of scientific information reflect a conservative leaning, following the 1995 GOP takeover. The interest group witnesses in particular reflect an increased influence of the Republican Party. Mooney appears to be correct in his analysis that there has been a change in the types of scientific information on which congress relies.

In sum, the results are mixed: the degree of politicization largely depends on the issues at hand.

### **Caveats**

A few caveats are worth noting to put the main findings into perspective. First and foremost, while the primary focus of my study is to look at the effects of the OTA and the sources of information on which Congress relies, we cannot neglect to acknowledge that the change or lack thereof that we find in sources of scientific information might not be due to the demise of the OTA, but rather, due to a bias inherent in the new Congress. This possibility is particularly relevant to the third hypothesis. While the OTA was present, both the Republicans and the Democrats had a common resource which would provide equally unbiased information to both, neither confirming nor denying the partisan claims of either. Specifically, the OTA sought to remain above making policy recommendations, thus keeping itself from falling into the trap of partisanship. One would expect that upon its demise, it would be possible to link an increase in political bias in the sources of scientific information to the absence of the OTA. However, it is possible that the change in sources of information (or lack thereof) could be caused by the change in congressional leadership, and might not be reflective of the absence of the OTA. While this leadership change creates our “window of opportunity” it could also be the direct cause of the changes that we see after 1995.

Second, in the original design of the study, I assumed that organizational affiliation correlated with the type of testimony that a witness would provide. I also assumed that a research based witness would provide more scientifically accurate and unbiased information than would an interest group or an industry witness. This assumption is based on logical principles, and corroborated by both Mooney and Bimber. However, the assumption is not expressly tested in this case study and thesis. Moreover, I do not take into consideration the individual political affiliations of academic witnesses or the particular testimonies of research witnesses. In so far as my study tests Bimber's conclusions using the same research characteristics, it is accurate and generally applicable. Further analysis should justify the assumptions which are made and clarify all remaining witness affiliations.

Finally, since the study is focused on one committee, the patterns found here should be subjected to further analysis before we generalize about the effect of OTA's demise. Though I have no reason to doubt that the political intent of hearings in other committees also varies by issue, future research should also take into account the scientific witnesses presented before committees that do not have the express jurisdiction over issues of scientific merit. Mooney would suggest that the primary politicization of science occurs precisely in committees that do not have the jurisdiction or the authority to consider issues of scientific merit. While the wide majority of science based hearings appear before the Science Committee, politicization is not arbitrarily confined to one particular committee. This assumption should also be tested, by expanding my research scope beyond merely this particular committee. An expansion of this nature would lend itself to conclusions which are more widely applicable to the entirety of congressional

committee hearings on science issues. Future steps for this analysis include consideration of committees other than the House Committee on Science, as well as analysis of direct witness testimony and a complete witness affiliation database.

### **Concluding Remarks**

Jon M. Peha, Professor of Electrical Engineering and Public Policy at Carnegie Mellon University stated on July 25, 2006,

“This year, almost every committee in Congress will face one or more issues that are similarly hard to disentangle without expertise in some area of science or technology. This includes issues related to energy, the environment, health care, food safety, national defense, homeland security, space exploration, intellectual property, transportation, and telecommunications, just to name a few (Peha, 2006, 1).”

Peha (2006, 1) goes on to discuss the characteristics of an effective science advisory organization, stating that it must be “responsive, credible, impartial, and independent.”

Without a doubt, the OTA served as this source of information to Congress. In its absence, Congress members must find a replacement for OTA or go without the objective, balanced information provided by the OTA. Peha states,

“In short, there is a fundamental gap in the information available to Congress. There is no consistent source of in-depth assessments that are balanced, complete, impartial, and produced at a time and in a format that is sensitive to the specific needs of Congress [9]. CRS reports are sensitive to Congressional needs and are designed to be impartial, but, by design, are limited in scope and depth. Partisan input also can be sensitive to the needs of Congress, but it is never impartial. Other information produced outside of Congress tends to be far less sensitive to Congressional needs, and the majority of it advocates for particular positions rather than merely providing a baseline assessment (6).”

The results of my analysis of the second hypothesis demonstrate in the case of NASA that Congress felt the need for such a research agency, replacing the OTA with PIPS and the NCGIA. The hearings on Superfund appear partially to replace the OTA

with the GAO. In the case of global warming, the 1995 GOP takeover resulted in the shortage of all research witnesses. Whether this gap was directly linked to the absence of the OTA, or whether it was an indirect consequence of the administrative change, the conclusion is still the same: Congress felt a significant absence of a particular type of responsive, credible, impartial, and independent information. The results of the third hypothesis confirm this conclusion: in the absence of the OTA, the issues which were politically tenuous saw a striking lack of non-politicized testimony. Though we should be glad that politicization is not rampant across all issues, politicization of science for any issue is no less worrisome than if it extended across the broad range of issues.

## **APPENDIX A: Acronyms**

AAAS: American Association for the Advancement of Science  
AAES: American Association of Engineering Societies  
ACEEE: American Council for an Energy-Efficient Economy  
AF: Air Force  
AFL-CIO: American Federation of Labor-Congress of Industrial Organizations  
AGU: American Geological Union  
AIAA: American Institute of Aeronautics and Astronautics  
AISSO: AeroAstro and International Small Satellite Organization  
AL: American Legion  
ANEC: American Nuclear Energy Council  
API: American Petroleum Institute  
ASA: Aerospace States Association  
ASEB: American Societies for Experimental Biology  
ASGSB: American Society for Gravitational and Space Biology  
ASI: Analytic Services Inc  
ASME: American Society of Mechanical Engineers  
ATSDR: Agency for Toxic Substances and Disease Registry  
AV: AeroVironment  
BA: K W Brown and Assocs  
BCSE: Business Council for Sustainable Energy  
BT: Banker's Trust  
CACNSP: Citizens' Advisory Council on National Space Policy  
CAN: Concerned Neighbors in Action  
CBO: Congressional Budget Office  
CCHW: Citizen's Clearinghouse for Hazardous Wastes  
CDC: Center for Disease Control  
CE: Coalition for the Environment  
CEI: Competitive Enterprise Institute  
CEQ: Council on Environmental Quality  
CERCLA: Comprehensive Environmental Response, Compensation and Liability Act  
CRA: Charles River Associates  
CRS: Congressional Research Service  
CSRC: Contaminated Sites Resident Committee  
CURC: Coal Utilization Research Council  
DARPA: Defense Advanced Research Projects Agency  
DOC: Department of Commerce  
DOD: Department of Defense  
DOE: Department of Energy  
DOS: Department of State  
DOT: Department of Transportation  
EDF: Environmental Defense Fund  
EHPA: Environmental Health Protection Agent  
EIA: Energy Information Administration  
EPA: Environmental Protection Agency

EPRI: Electric Power Research Institute  
FAA: Federal Aviation Administration  
FAS: Federation of American Scientists  
GAO: Government Accountability Office  
GARP: Global Atmospheric Research Program  
GCC: Council for Global Climate Change  
GOP: Grand Old Party (Republican Party)  
GRI: Gas Research Institute  
GS: Geological Survey  
GZA: Goldberg-Zoino and Assocs  
HA: Hirschhorn and Associates  
HRS: Hazardous Ranking System  
HSRC: Northeast Hazardous Substance Research Center  
HWTC: Hazardous Waste Treatment Council  
IEEE: Institute of Electrical and Electronics Engineers  
IPA: Independent Petroleum Association  
IPCC: Intergovernmental Panel on Climate Change  
IRG: International Resources Group, Ltd  
ISCD: Internal Security and Commerce Division  
IWS: Ill Water Survey  
L5S: L5 Society  
MPAG: Madison Public Affairs Group  
NAS: National Academy of the Sciences  
NASA: National Aeronautics and Space Administration  
NASUCA: National Association of State Utility Consumer Advocates  
NCAR: National Center for Atmospheric Research  
NCATH: National Campaign Against Toxic Hazards and Clean Water Action Project  
NCGIA: National Center for Geographical Information and Analysis  
NCP: National Contingency Plan  
NEI: Nuclear Energy Institute  
NHA: National Hydrogen Association  
NHPA: New Hampshire People's Alliance  
NIEHS: National Institute of Environmental Health Sciences  
NIH: National Institutes of Health  
NMA: National Mining Association  
NOAA: National Oceanic and Atmospheric Administration.  
NPL: National Priorities List  
NRC: National Research Council  
NRDC: National Resources Defense Council  
NRDC: Natural Resources Defense Council  
NSF: National Science Foundation  
NSS: National Space Society  
OAST: Office of Aeronautics and Space Technology  
OBM: Office of Budget Management  
OCST: Office of Commercial Space Transportation  
OEETD: Office of Environmental Engineering and Technology Demonstration



OERR: Office of Emergency and Remedial Response  
ORD: Office of Research and Development  
OSRMQA: Office of Safety, Reliability, Maintainability and Quality Assurance  
OSTP: Office of Science and Technology Policy  
OTA: Office of Technology Assessment  
PFUT: Project Finance, Utilities and Telecommunications Group  
PIPS: Potomac Institute for Policy Studies  
PS: Planetary Society  
R&D: Research and Development  
RAGS: Rising Above the Gathering Storm  
Reach: Reach for the Stars '89  
RF: Resources for the Future  
RMI: Rocky Mountain Institute  
RRS: RUST Remedial Service  
S&T: Science and Technology  
SERI: Solar Energy Research Institute  
SFF: Space Frontier Foundation  
SIO: Scripps Institution of Oceanography  
SLH: Shearson Lehman Hutton  
SRS: Scientific Research Society  
SSTC: Space Systems Technical Committee  
TAB: Technology Assessment Board  
UMWA: United Mine Workers Association  
USA: United Space Alliance  
USPIR: US Public Interest Research Group  
USSR: Union of Soviet Socialist Republics  
WHRC: Woods Hole Research Center  
WMO: World Meteorological Organization  
WRI: World Resources Institute

## APPENDIX B: GOVERNMENT AND INTEREST GROUP WITNESS TRENDS

### NASA WITNESS TRENDS: GOVERNMENT AND INTEREST GROUPS

<b>Government</b>	<b>BEFORE</b>	<b>AFTER</b>
AF	1	1
DARPA	0	1
DOC	5	1
DOD	2	0
DOT	9	0
FAA	0	1
GS	0	1
ISCD	1	0
NASA	125	35
NIH	0	1
OAST	2	0
OCST	1	0
OSRMQA	1	0
Representatives	8	0

<b>Interest Group</b>	<b>BEFORE</b>	<b>AFTER</b>
AIAA	10	1
IEEE	10	0
NSS	9	0
ASME	5	0
AL	2	0
PS	1	1
SFF	1	1
AAES	1	0
AGU	1	0
ASI	1	0
BT	1	0
CACNSP	1	0
FAS	1	0
L5S	1	0
PFUT	1	0
Reach	1	0
SLH	1	0
SSTC	1	0
ASA	0	2
USA	0	2
AISSO	0	1
ASEB	0	1
ASGSB	0	1
AV	0	1
CATO	0	1

**SUPERFUND WITNESS TRENDS: GOVERNMENT AND INTEREST GROUPS**

<b>Government</b>	<b>Before</b>	<b>After</b>
EPA	16	5
ORD	0	1
State Governments	20	0
Senator/Representative	5	0
Mayors	3	0
DOE	2	0
AF	1	0
ATSDR	1	0
CDC	1	0
EHPA	1	0
GS	1	0
NIEHS	1	0
OEETD	1	0
OERR	1	0

<b>Interest Groups</b>	<b>Before</b>	<b>After</b>
State-Specific groups	10	1
HWTC	4	0
NHPA	3	0
NRDC	2	0
BA	1	0
CAN	1	0
CCHW	1	0
CE	1	0
CSRC	1	0
EDF	1	0
GZA	1	0
HA	1	0
NCATH	1	0
RRS	1	0

GLOBAL WARMING TRENDS: GOVERNMENT AND INTEREST GROUPS

Government	Before	After
CEQ	1	1
DOC	0	1
DOE	7	9
DOS	1	1
EIA	0	2
EPA	3	2
NASA	3	1
NOAA	7	1
NSF	5	1
OSTP	1	2
Senator/Representative	0	4

Interest Group	Before	After
ACEEE	0	1
AFL-CIO	0	1
ANEC	1	0
ASME	1	0
BCSE	0	1
CEI	0	1
GCC	0	1
CRA	0	2
EDF	0	1
GRI	1	0
IPA	0	1
IRG	0	1
MPAG	0	1
NASUCA	0	1
NHA	0	1
NMA	0	1
UMWA	0	2
WRI	2	0
USPIR	0	2

## BIBLIOGRAPHY:

Baumgartner, Frank R. and Bryan D. Jones. 1993. Agendas and Instability in American Politics. Chicago: University of Chicago Press, Ltd.

BBC News. 1998. "1998: Clinton's Grand Jury testimony released." BBC News. September 21, 1998. Last Accessed March 21, 2007. [http://news.bbc.co.uk/onthisday/hi/dates/stories/september/21/newsid\\_2525000/2525339.stm](http://news.bbc.co.uk/onthisday/hi/dates/stories/september/21/newsid_2525000/2525339.stm)

Bimber, Bruce. 1996. The Politics of Expertise in Congress: The Rise and Fall of the Office of Technology Assessment. New York City: State University of New York Press.

Blair, Peter D., Ph. D. National Research Committee. 2006. "Science and Technology Advice to Congress: Then, Now and Looking Forward. The Current and Potential Role of the National Academies," July 25, 2006. Last Accessed January 20, 2007. [http://www7.nationalacademies.org/ocga/testimony/Science\\_andTechnology\\_Advice\\_to\\_Congress.asp](http://www7.nationalacademies.org/ocga/testimony/Science_andTechnology_Advice_to_Congress.asp)

Brown, George E., Jr. 1995. "OTA, Congress's Defense Against the Dumb, Closes Down: Congress Left Defenseless." Press Release, 29 September 1995. Last accessed January 23, 2007. <http://sciencedems.house.gov/press/PRArticle.aspx?NewsID=406> .

Bush, President G.W. 2007. "State of the Union Address." 23 January 2007. Last Accessed March 2, 2007. <http://www.whitehouse.gov/news/releases/2007/01/20070123-2.html>

Clark, William C., and Giandomenico Majone. 1985. "The Critical Appraisal of Scientific Inquires with Policy Implications," Science, Technology and Human Values Vol. 10, No. 3: pp. 6-19.

Dumas, Lloyd. 1999. Lethal Arrogance: Human Fallibility and Dangerous Technologies. New York: St. Martins Press.

Eldridge, N. & Gould, S.J. 1972 Punctuated Equilibria: An Alternative to Phyletic Gradualism. In: *Models in Paleobiology*, (ed. T.J. M. Schopf). San Francisco: Freeman Cooper

Golden, William, Ed. 1995. Science and Technology Advice to the President, Congress, and Judiciary; Second edition. New Brunswick (USA) and London (UK): Transaction Publishers.

Goodman, Billy. 2000. "Science Advice in Congress after OTA." Bioscience Volume 50, Issue 6: pp. 486

Hansen, James. 2004. "Defusing the Global Warming Time Bomb." Scientific American March: pp. 69-77.

Holt, Rush. 2006. "CONGRESS AND TECH ADVICE." Testimony before the House Committee on Science. July 25, 2006. Last Accessed April 9, 2007.  
[http://holt.house.gov/pdf/RH\\_testimony\\_SciCommittee\\_72506\\_FINAL.pdf](http://holt.house.gov/pdf/RH_testimony_SciCommittee_72506_FINAL.pdf)

Houghton, Amo. 1995. "In Memoriam: The Office of Technology Assessment, 1972-95." Congressional Record, Extension of Remarks - September 28, 1995: pp. E1868-1870.

Kennedy, Ted. 1995. "Record of OTA's Organization, Operations, and Abolishment." September 1995. Last Accessed March 2, 2007.  
<http://www.wws.princeton.edu/ota/disk1/1996/9603/960309.PDF>

Leary, Warren E., September 24, 1995 "Congress's Science Agency Prepares to Close Its Doors," New York Times: pp 26. Last Accessed March 20, 2007.  
[http://www.wws.princeton.edu/ota/ns20/nyt95\\_f.html](http://www.wws.princeton.edu/ota/ns20/nyt95_f.html).

Mazur, Alan. 1981. The Dynamics of Technical Controversy. Washington, DC: Communications Press, Inc.

Mooney, Chris. 2005. The Republican War on Science. New York: Basic Books.

Morella, Connie. 1995. "Record of OTA's Organization, Operations, and Abolishment." September 1995. Last Accessed March 2, 2007.  
<http://www.wws.princeton.edu/ota/disk1/1996/9603/960309.PDF>

Morgan, M. Granger and Jon Peha, Ed. 2003. Science and Technology Advice for Congress. Danvers, Massachusetts: Resources for the Future.

NAS. 2001. "Climate Change Science: An Analysis of Some Key Questions." Last Accessed March 2, 2007. [http://books.nap.edu/openbook.php?record\\_id=10139&page=1](http://books.nap.edu/openbook.php?record_id=10139&page=1)

NPACI (National Partnership for Advanced Computational Infrastructure Archives). 1999. "Scientific Community Mourns Passing of Rep. George E. Brown, Jr. (D-CA)." Volume 3, Issue 15 - July 21, 1999. Last Accessed March 20, 2007.  
<http://www.npaci.edu/online/v3.15/brown.html>.

NRC (National Research Council). 2001. "Climate Change Science: An Analysis of Some Key Questions." NRC Reports 2001: pp.1

Peha, Jon M. Carnegie Mellon University. 2006. "Scientific and Technical Assessment and Advice for the U.S. Congress." Testimony before the House Science Committee. July

25, 2006. Last Accessed April 9, 2007.

<http://science.house.gov/commdocs/hearings/full06/July%2025/Peha.pdf>

NAS (National Academy of the Sciences). 2006. "Rising Above the Gathering Storm Report" National Academy of the Sciences Prepublication copy February: chapter 2, pp.1.

Sensenbrenner, F. James, Jr. 1998. "Unlocking Our Future: Toward a New National Science Policy." Report to Congress by the House Committee on Science September 24, 1998.

Shein, K.A., ed. 2006. "State of the Climate in 2005." Bulletin of the American Meteorological Society Vol. 87: pp. S1-S102.

Teich, Albert, Ph.D. Director, Science and Policy Programs, American Association for the Advancement of Science (AAAS). 2006. Testimony before the House Committee on Science, July 25, 2006. Last Accessed April 9, 2007.

<http://gop.science.house.gov/hearings/full06/July%2025/teich.pdf>

Tennyson, Stephanie L. 2004. "About the Potomac Institute for Policy Studies." Review of Policy Research Vol. 21 (1): pp. 3-4. doi:10.1111/j.1541-1338.2004.00053.x

Walker, Robert S. 2001. "OTA Reconsidered." Issues in Science and Technology Spring 2001. Last Accessed March 20, 2007. <http://www.issues.org/17.3/forum.htm>.

Weiss, Rick. September 17, 2002. "HHS Seeks Science Advice to Match Bush Views." Washington Post. p. A01.