Citizen Advisory Councils and Environmental Management in the Marine Oil Trade

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Technical Report Based on Doctoral Dissertation

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1997

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EXECUTIVE SUMMARY

In the aftermath of the 1989 *Exxon Valdez* oil spill in Alaska, citizen advisory councils were established in Alaska, Maine and California to provide advice on the environmental management of the marine oil trade. This study evaluates the effectiveness of these councils in contributing to the policy process. The methods of this study include interviews with 69 respondents affiliated with the councils, government agencies, and the oil industry; analyses of reports produced by the councils; and a mail survey administered to all of the council members.

This study demonstrates that citizen advisory councils are capable of making important contributions to the production of new knowledge in the policy process. For example, the Prince William Sound council (which represents communities impacted by the *Exxon Valdez* oil spill) has made important contributions to the production of new knowledge through studies of oil tanker navigation and escort operations, marine oil firefighting, oil spill response operations, and environmental conditions in the Sound. The Cook Inlet council (which represents communities in the Cook Inlet region of Alaska) has made important contributions to the production of new knowledge through studies of oil platform safety, oil spill response operations, and environmental conditions in the Inlet.

This study also demonstrates that citizen advisory councils are capable of making important contributions to the implementation of new environmental safeguards (including new laws, regulations, procedures, and equipment). For example, the work of the Prince William Sound council has contributed to several major changes in the safeguards against marine oil pollution employed in the Sound. These new safeguards include changes in oil tanker navigation and escort procedures, the deployment of new tug escort vessels, the deployment of new weather reporting equipment, and the creation of a training symposium for marine firefighting. The work of the Maine council has contributed to the passage of a new provision in U.S. law which facilitates transboundary oil spill response efforts.

Technical and organizational resources play a key role in affecting the ability of the councils to produce new knowledge, and in some cases also affect the ability of the councils to contribute to policy change. Council resources such as funding, staff, expert consultants, and volunteer advisors allow the council members to delegate tasks, thereby enhancing the ability of the councils to study policy issues and support their arguments for policy change. Discretionary funding is a particularly critical resource for the councils. For example, all of the research projects undertaken by the councils in this study have required financial support from the councils to pay for the costs of expert consultants and project management by staff. In some cases, the councils have reinforced their own resources by pooling funding and equipment with other organizations in joint research projects. Research projects, in turn, have played a central role in allowing the councils to generate new knowledge in a policy area involving complex questions of science and technology. In some cases, research projects have also allowed the councils to contribute to the implementation of new environmental safeguards.

While technical and organizational resources play a pivotal role in affecting the ability of the councils to generate new knowledge, political context plays the decisive role in affecting the ability of the councils to secure the implementation of their proposals for policy change. *Political context* is defined by the level of support which the proposals of the councils receive from key stakeholder groups (those groups with authority or influence in the policy areas of

interest to the councils). An examination of eight cases where the councils in this study have proposed major policy changes shows that the fate of these proposals depends on the level of support they receive from key stakeholder groups. The policy proposals of the councils have been implemented only when they have received active support from key stakeholder groups. The policy proposals of the councils have not been implemented when they have encountered low support or active opposition from key stakeholder groups.

When the policy positions of an advisory council conflict with those of key stakeholder groups, the council can improve its chances of achieving policy change by attempting to reconcile these conflicting positions through the use of *dispute resolution methods*. The findings from two cases in this study suggest that the manner in which the dispute resolution process is structured can affect the ability of the council to contribute to policy change. The findings of this study indicate that the use of *adversarial analysis* (in which the council and other stakeholder groups generate competing technical knowledge claims to support their conflicting positions) is not an effective means of resolving a technically intensive policy dispute. The problem with adversarial analysis is that all of the groups in the debate are wary of the potential for manipulation in such partisan knowledge claims. Therefore, the knowledge claims made by any one group in the policy debate are suspect in the eyes of the contesting groups. This climate of mutual skepticism can deadlock the policy process when the contesting groups refuse to accept the validity of each other's knowledge claims as a basis for policy decisions. A more effective method for the resolution of technically intensive disputes is *collaborative analysis*, in which the council and other key groups study a disputed issue through a jointly managed research project. In a collaborative approach to analysis, representatives from all of the groups involved in the debate have the opportunity to closely monitor and adjust the course of the research project throughout its evolution. Collaborative analysis provides each group the means to assure that the other groups are not manipulating the research, and therefore improves the chances that the results of the study will be accepted by all the groups as a valid basis for policy decisions.

In sum, this study demonstrates that citizen advisory councils can make important contributions to the policy process. The councils in this study have contributed both to the production of new knowledge in the policy process and to the implementation of new environmental safeguards. There are several factors which play important roles in determining the ability of the councils to contribute to the policy process. First, technical and organizational resources in the form of funding, staff, expert consultants, and volunteer advisors play a central role in allowing the councils to pursue research projects. Research projects, in turn, greatly enhance the ability of the councils to generate new knowledge and contribute to policy change. Second, political context plays a decisive role in affecting the ability of the councils to contribute to policy change. The fate of council proposals for policy change depends on the level of support those proposals receive from key stakeholder groups. Third, the use of a collaborative approach to analysis can help councils to resolve technically intensive policy disputes with other stakeholder groups, thereby enhancing the ability of the councils to contribute to policy change.

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LIST OF ABBREVIATIONS

RCAC	Regional Citizens Advisory Council
PWS RCAC	Prince William Sound Regional Citizens Advisory Council
CIRCAC	Cook Inlet Regional Citizens Advisory Council
OSAC	Maine Oil Spill Advisory Committee
TAC	California Oil Spill Technical Advisory Committee
ADEC	Alaska Department of Environmental Conservation
DEP	Maine Department of Environmental Protection
OSPR	Office of Oil Spill Prevention and Response
EPA	Environmental Protection Agency
NOAA	National Oceanic and Atmospheric Administration
TAPS	Trans-Alaska Pipeline System
ARCO	Atlantic Richfield Company
MSO Anchorage	U.S. Coast Guard Marine Safety Office in Anchorage, Alaska
MSO Valdez	U.S. Coast Guard Marine Safety Office in Valdez, Alaska
MSO Portland	U.S. Coast Guard Marine Safety Office in Portland, Maine
knot	nautical mile per hour (1.15 standard miles per hour)

ACKNOWLEDGMENTS

The author would like to thank the following organizations for their assistance in completing this study: the Prince William Sound Regional Citizens Advisory Council, the Cook Inlet Regional Citizens Advisory Council, the Maine Oil Spill Advisory Committee, the California Oil Spill Technical Advisory Committee, the Alaska Department of Environmental Conservation, the California Department of Fish and Game, the Maine Department of Environmental Protection, the U.S. Coast Guard, the National Oceanic and Atmospheric Administration, the U.S. Environmental Protection Agency, the British Petroleum Company, the Exxon Corporation, the Atlantic Richfield Company, the UNOCAL Corporation, the Tesoro Alaska Petroleum Company, the Maine Petroleum Association, the Alyeska Pipeline Service Company, Chevron, the Marine Spill Response Corporation, Cook Inlet Spill Prevention and Response Incorporated, the National Science Foundation, the University of North Carolina at Chapel Hill, the Environmental Resource Program, and the Claremont Graduate University. This project was funded by academic research grants from the National Science Foundation and the Exxon Corporation.

I. INTRODUCTION

Through what methods can citizens contribute to environmental policy decisions? This question is central to the study of environmental policy in democratic nations. As many authors have recognized, the technical dimensions of environmental policy decisions create the need for participatory forms which allow for detailed dialogue and mutual learning between representatives from communities, governments, and industries (Laird, 1993a, 1993b; Fischer, 1993; Fiorino, 1989a, 1989b, 1990). One participatory form which shows considerable promise in this regard is the *citizen advisory council,* also referred to as the citizen advisory committee in the literature (Lynn and Busenberg, 1995). A citizen advisory council is usually composed of a small group of citizens who meet repeatedly to consider policy issues and to advise other organizations. The trait that distinguishes citizen advisory councils from other public participation methods, such as public hearings or community surveys, is the potential for direct and recurring interaction between the participants. Citizen advisory councils are of particular interest in the field of environmental policy, which frequently evokes complex technical questions, because the advisory council setting facilitates communication between the participants about policy issues with technical dimensions. The ability of the participants in the advisory process to exchange detailed information and engage in mutual learning can enhance their ability to produce well-informed advice.

This study examines the work of four citizen advisory councils established in Alaska, Maine, and California in the aftermath of the 1989 *Exxon Valdez* oil spill in Prince William Sound, Alaska. The central goal of these councils is to seek improvements in policies aimed at preventing marine oil pollution. This is the first study of the use of citizen advisory councils in the area of marine oil pollution prevention (Lynn and Busenberg, 1995).

1.1. Literature Review

An empirical literature which examines the role of citizen advisory councils in environmental management and policy has developed over the past two decades. Most of the advisory councils studied in this literature have advised governmental bodies at the local, state, regional, and federal levels in policy areas such as water resources planning, hazardous and solid waste management, land use planning, air quality planning, and radioactive waste management (Lynn and Busenberg, 1995). Two recent studies have examined the use of councils which advise the chemical industry (Cohen, Chess, Lynn, and Busenberg, 1995a, 1995b). The dominant research approaches used in this body of literature are single and multiple case studies. Interviews and participant observation are the most common data collection methods found in the literature. Some studies also use mail surveys and document analyses. A few studies rely on mail surveys alone (Lynn and Busenberg, 1995).

Council effectiveness is defined in a wide variety of ways in the existing literature. The definition of effectiveness that appears most consistently in the literature is the implementation of council advice (Delli Priscoli, 1976; Stewart, Dennis, and Ely, 1984; Lynn, 1987; Houghton, 1988; Nelson, 1990; Kathlene and Martin, 1991; Nelson, 1990; Cohen 1995; Cohen, Chess, Lynn, and Busenberg, 1995a, 1995b). Another definition of effectiveness which appears

frequently in the literature is the incorporation of citizen priorities and judgments in the work of the council (Delli Priscoli, 1976; Hannah and Lewis, 1982; Stewart, Dennis, and Ely, 1984; Kathlene and Martin, 1991; Scrimgeour and Hanson, 1993; Cohen, Chess, Lynn, and Busenberg, 1995a, 1995b). A third definition of effectiveness that appears in some studies is the representation of affected communities by the council members (Delli Priscoli, 1976; Kathlene and Martin, 1991; Pierce and Doerkson, 1976). Other definitions of effectiveness found in the literature include the development of consensus among the participants (Nelson, 1990; Ross and Associates, 1991; Triangle Associates, 1993), the development of mutual trust among the participants (Nelson, 1990; Cohen, Chess, Lynn, and Busenberg, 1995a, 1995b), the independent review of projects and plans by the council (Scrimgeour and Hanson, 1993), community education (Howell, Olsen, and Olsen, 1987), the fulfillment of participant expectations for the advisory process (Plumlee, Starling, and Kramer, 1985), the level of citizen member control over the work of the council (Hannah and Lewis, 1982), and the development of public support for the projects the council reviews (Cohen, 1995).

The existing literature identifies a number of independent variables which influence the effectiveness of advisory councils. The use of independent sources of information by the council (sources other than the sponsors of the council) appears in several studies as an independent variable. In a comparative case study of nine advisory councils involved in local planning, Hannah and Lewis (1982) find that the use of independent sources of information by advisory councils increases the level of citizen control over the work of the councils. In another comparative case study of nine advisory councils involved in local planning, Houghton (1988) finds that the use of independent sources of information by advisory councils enhances the ability of the councils to secure the implementation of their recommendations. Access to independent sources of *technical* information and assistance appears in several recent studies as an independent variable influencing council effectiveness. In case studies of two councils involved in local hazardous waste management, Lynn (1987) finds that the members of advisory councils can enhance both their understanding of technical issues and their influence on the policy process by using volunteer experts drawn from local industries and universities. In case studies of two advisory councils involved in local waste management, Cohen (1995) finds that technical assistance is instrumental in enabling advisory councils to effectively review project plans, to generate proposals for project improvements, and to secure the implementation of their proposals. In a case study of an advisory council involved in the environmental management of a chemical facility, Cohen, Chess, Lynn, and Busenberg (1995b) find that an advisory council which is allowed to select independent technical consultants to study issues of interest to the council gains credibility in the eyes of the sponsor and is better able to secure the implementation of its recommendations.

An independent variable which appears in two studies is administrative support. Lynn (1987) finds that support from the staff of sponsoring organizations (both in handling meeting logistics and obtaining information for the council) enhances the ability of the council to understand technical plans and generate useful advice. In a case study of an advisory council involved in state wetlands policy, Nelson (1990) finds that staff support enhances the productivity of a council by allowing the council members to concentrate on policy issues rather than on meeting logistics.

The level of involvement of citizen members in directing the work of their advisory councils is another independent variable which appears in the existing literature. Two studies in

this literature find that reducing the level of citizen member involvement in directing the work of advisory councils has a highly detrimental effect on the ability of the citizen participants to incorporate their priorities and judgments in the work of the councils. In a case study of an advisory council involved in local air quality planning, Stewart, Dennis, and Ely (1984) find planners making critical judgments in technical analyses without involving citizen advisors, thereby impeding meaningful citizen participation in the planning process. In case studies of two advisory councils involved in local water quality planning, Plumlee, Starling, and Kramer (1985) find that council members faced with what they perceive as unduly limited involvement in directing the work of their advisory councils react with apathy and even antipathy to the advisory process.

The level of agreement between the participants in the advisory process regarding their expectations for this process is repeatedly cited in the literature as an independent variable. In case studies of four advisory councils involved in regional water resources planning, Priscolli (1976) finds that conflicting expectations between the participants in the advisory process hampers communication and diminishes trust between these participants. These findings are echoed in Plumlee, Starling, and Kramer (1985). Studies of two advisory councils involved in local and regional hazardous waste management find that the effectiveness of advisory councils is enhanced when the participants agree on common expectations and tasks (Ross and Associates, 1991; Triangle Associates, 1993).

Professional facilitation appears in five studies as an independent variable influencing council success. These studies find that facilitators enhance council productivity by allowing the members to concentrate on policy issues rather than on meeting logistics and processes, and that facilitators can help to maintain constructive discussions about controversial issues (Nelson, 1990; Ross and Associates, 1991; Triangle Associates, 1993; Cohen, Chess, Lynn, and Busenberg, 1995a, 1995b).

The method of council member selection appears in three studies as an independent variable influencing the representativeness of advisory councils. In case studies of five advisory councils involved in regional water resources planning, Pierce and Doerksen (1976) use a mail survey to examine the impact of member selection methods on the disparity between the policy preferences of the council members and a sample of non-participants drawn from the affected communities. They distinguish between open recruitment methods (where members volunteer or are elected at public meetings) and closed recruitment methods (where members are selected by public officials, companies, or other organizations). They find that increasing the openness of recruitment methods increases the disparity between the policy preferences of the council and community samples. They conclude that open recruitment methods attract representatives from organizations with intense commitments to the policy issues being considered, and thereby increase the disparity between the policy preferences of the council members and the members of the affected communities. Delli Priscoli (1976) finds that an informal, closed recruitment process results in the selection of a group of council members whose mean socioeconomic status indicators (such as education, income, sex, and race) do not match the mean socioeconomic status indicators of the affected communities. Kathlene and Martin (1991) examine an unusual advisory council involved in local transportation planning which is constructed through the use of random sampling techniques. They find that the mean income and education levels of the resulting group of council members are higher than those found in the affected community, but

after comparing survey responses from council members to responses from a community sample, they conclude that this council is capable of representing the affected community.

Membership characteristics appear in one study as an independent variable. Hannah and Lewis (1982) find that increasing the proportion of citizen members with professional occupations in an advisory council increases the level of citizen member control over the work of the council.

The level of autonomy of an advisory council from its sponsors appears in two studies as an independent variable. Hannah and Lewis (1982) find that strengthening the structural affiliation between a council and its sponsor decreases the level of citizen member control over the work of the council. However, they also find that advisory councils which are more closely affiliated with their sponsors are given the opportunity to consider more significant policy issues. Houghton (1988) combines three independent variables into an index of council autonomy (these three variables are the extent to which a council gathers independent information, solicits support for its recommendations from the community, and challenges the sponsor). He finds that increasing the autonomy of an advisory council from its sponsors enhances the ability of the council to secure the implementation of its proposals.

Data sharing on the part of the sponsor and the involvement of decision-makers in council meetings are independent variables which appear in two recent studies of advisory councils in the chemical industry. Cohen, Chess, Lynn, and Busenberg (1995a, 1995b) find that unrestricted data sharing on the part of the sponsor is a key factor in securing the trust of the council in the sponsor. They also find that the involvement of key organizational actors in council meetings enhances the perceived usefulness of the advisory process among the citizen members.

One study proposes the level of sponsor power as an independent variable affecting dependent variables such as the level of citizen member involvement in the participation programs, the access of citizen members to information resources, and member selection methods. In a survey-based study of 394 citizen participation units involved in state planning, MacNair, Pollane, and Caldwell (1983) find that increasing the power of the sponsor leads it to restrict the role of its citizen participation units. They propose that a sponsor with substantial power can afford to limit the role of citizen participants in its decisions, while a sponsor with less power is more eager to develop a partnership with the citizen participants so as to build public support for itself.

Several questions emerge from the existing literature discussed above. First, it is not clear that this literature demonstrates the full potential of citizen advisory councils to contribute to the policy process. Recent studies have emphasized the importance of technical and organizational resources in shaping the ability of advisory councils to contribute to the policy process. However, the councils examined in this literature are fairly weak institutions. In all of the cases examined in the existing literature, their access to technical and organizational resources (including funding, staff, and technical advice) is very limited by comparison to the institutions they advise. Furthermore, many of these councils are ephemeral organizations which disband after considering a single issue or cluster of issues (Lynn and Busenberg, 1995; Kathlene and Martin, 1991; Lynn, 1987; Stewart, Dennis, and Ely, 1984; Nelson, 1990). Could an advisory council with greater resources and longevity than those considered in the literature have a greater impact on the policy process? Second, the existing literature does not fully explore the role of political context on the capacity of the councils to contribute to the policy process. Political context is defined by the policy positions taken by key stakeholder groups (those groups holding

authority or influence in the policy areas of interest to the councils). Advisory councils rarely have the resources or authority to implement their own policy proposals. Therefore, the support given by other stakeholder groups to council proposals is of pivotal importance in determining whether or not these proposals will be implemented. What is the role played by the policy positions of key stakeholder groups (such as government and industrial organizations) on the ability of the councils to secure policy change? This is a particularly intriguing question when the councils are advising multiple stakeholder groups with influence over the implementation of council proposals. Finally, the existing literature on advisory councils does not consider the use of dispute resolution methods by advisory councils which are attempting to negotiate their policy positions with other stakeholder groups. Can advisory councils make use of dispute resolution methods to negotiate policy change in the face of initial resistance or recalcitrance on the part of other stakeholder groups?

The goal of this research project is to answer the above questions through a new study of the role of citizen advisory councils in the field of environmental policy. This research project examines a group of advisory councils which have greater longevity and access to resources than the councils examined in the existing literature. The group of councils chosen for this study are described in the following section. In essence, the goal of this study is to examine the achievements of a novel group of citizen advisory councils, some of which possess greater institutional strength than the councils examined in the existing literature; to examine the effects of variations in institutional strength on the ability of these councils to contribute to the policy process; and to further extend the literature on this subject by examining the effects of the interaction between these councils and other stakeholder groups on the ability of the councils to contribute to the policy process.

The research goals outlined above require the use of research methods which allow a highly detailed examination of the process by which the councils form policy proposals, interact with other stakeholder groups, and secure policy change. The research methods used for this purpose are described in Chapter II.

1.2. Background

The 1989 *Exxon Valdez* oil spill in Prince William Sound, Alaska was the impetus for the creation of the four citizen advisory councils examined in this study. The *Exxon Valdez* disaster created a major public relations crisis for the oil industry and triggered a cascade of new state and federal legislation on the environmental management of the marine oil trade, including the landmark U.S. Oil Pollution Act of 1990 (Wilkinson, Pittman, and Dye, 1992; Beaver, Butler, and Myster, 1994). Four citizen advisory councils were created by this wave of new legislation on marine oil spills. These new councils provided interesting subjects of study in two respects. First, the environmental management of the marine oil trade was a policy area not represented in the existing literature on the use of advisory councils in environmental policy. Second, two of these councils were established with greater longevity and access to resources than any of the councils examined in the existing literature (Busenberg and Lynn, 1995).

The Prince William Sound and Cook Inlet *Regional Citizens Advisory Councils* (RCACs) are mandated in the state of Alaska by the U.S. Oil Pollution Act of 1990. The purpose of the two Alaskan councils is to provide advice on the environmental management of oil tanker and

terminal operations in the Prince William Sound and Cook Inlet regions, respectively. The provisions of the Oil Pollution Act state that these councils will remain in operation for as long as the oil trade in the Prince William Sound and Cook Inlet regions remains active, and that these councils will receive funding from the oil industry during that time. The Oil Pollution Act also specifies that the Alaskan councils should represent local communities and designated groups representing local interests (including environmental organizations, the fishing and aquaculture industries, tourism and recreation organizations, and native organizations). Each local government and designated interest group in the region impacted by the *Exxon Valdez* oil spill appoints one member of the Prince William Sound council.[1] Similarly, each local government and designated interest group in the Cook Inlet region appoints one member of the Cook Inlet council (Oil Pollution Act of 1990; Prince William Sound RCAC, 1996a; Cook Inlet RCAC, 1996a).

The Maine *Oil Spill Advisory Committee* (referred to here as the Maine council) is mandated by the 1992 Amendments to the Maine Oil Spill Prevention and Response Provisions. The purpose of this council is to monitor oil spill prevention and response practices in the state of Maine. The members of this council are appointed by the Maine state government. Eight members of this council are appointed by the Governor, two by the President of the Senate, and three by the Speaker of the House (Maine Oil Spill Prevention and Response Provisions Amendments, 1992).

The California *Oil Spill Technical Advisory Committee* (referred to here as the California council) is mandated by the 1990 California Oil Spill Prevention and Response Act. The purpose of this council is to provide public input and independent judgment on the actions of state regulators involved in oil spill prevention and response. The members of this council are appointed by the California state government. The governor appoints five of the members. Four additional members are appointed by the Speaker of the State Assembly and the Senate Rules Council (Oil Spill Technical Advisory Committee, 1995, 1997; California Oil Spill Prevention and Response Act, 1990).

1.3. Purpose of Study and Conceptual Framework

1.3.1. Measuring Council Effectiveness

This study evaluates the effectiveness of four citizen advisory councils in contributing to the policy process, and analyzes the factors which influence council effectiveness. Two measures of council effectiveness constitute the dependent variables in this study. The first measure is the extent to which the councils contribute to the implementation of new environmental safeguards (including new laws, regulations, procedures, and equipment). This measure is based on the measure of effectiveness found most consistently in the existing literature on the use of citizen advisory councils in environmental policy: the ability of an advisory council to secure the implementation of its recommendations for policy change (Lynn and Busenberg, 1995). This study also introduces a new measure of council effectiveness: the

[1] The one exception is the city of Valdez, which appoints two members of the Prince William Sound council.

extent to which the council contributes to the production of new knowledge in the policy process. This new measure of council effectiveness is included in this study because councils can make contributions to the policy process simply by producing new knowledge (even if that knowledge does not lead directly to policy change). For example, an advisory council may produce information indicating that a given policy is meeting the goals of the council and other stakeholder groups. This is valuable knowledge in that it provides assurance that the policy in question is working well, and therefore allows the council and other stakeholder groups to redirect their attention and resources to other policies which may not be working well. Therefore, this new knowledge is useful in the policy process even though it does not lead directly to policy change.

In sum, this study defines council effectiveness as the ability of the council to contribute both to the production of new knowledge in the policy process and to the implementation of new environmental safeguards. In the sections to follow, a conceptual framework is developed which links three independent variables to council effectiveness.

1.3.2. Technical and Organizational Resources

The literature on the use of citizen advisory councils in environmental policy identifies a set of resources which councils can use to enhance their effectiveness. These include technical resources (in the form of expert advice) and organizational resources (in the form of staff and volunteer support). Council resources appear as an independent variable in more studies than any other independent variable in the existing literature (Lynn and Busenberg, 1995). Access to independent sources of *technical* information is recognized in several recent studies as a variable influencing council effectiveness (Lynn, 1987; Cohen, 1995; Cohen, Chess, Lynn, and Busenberg, 1995b). Councils may gather technical information by recruiting volunteer expert advisors, and councils with access to funding may employ expert consultants for the same purpose. These technical resources can enhance the ability of advisory councils to evaluate the technical dimensions of policy issues and so enhance their ability to contribute to the policy process.

The organizational resources of a council consist of staff, volunteer advisors, and the commitment of time made by the council members themselves to the advisory process. Staff support appears as an independent variable influencing council effectiveness in two existing studies (Lynn, 1987; Nelson, 1990). Staff support can be donated by sponsoring organizations, and councils with access to funding may hire their own staff. Staff and volunteer advisors allow the council members to delegate some of the tasks necessary to manage research programs and other organizational goals, thereby enhancing the productivity of the councils. Increasing the commitment of time made by the council members themselves to the advisory process will also tend to enhance the productivity of the councils. In essence, technical and organizational resources can enhance the capacity of the councils to produce new knowledge and policy proposals, and can also enhance the ability of the councils to promote their policy proposals on the agendas of other stakeholder groups.

Council resources may come from three different sources. First, the councils can be given discretionary funding with which to pay the costs of staff, expert advisors, and equipment. Second, sponsoring organizations can donate staff time, expert advice, and equipment to the

councils (or to collaborative projects in which the councils are involved). Third, the councils can recruit voluntary contributions of time from council members, expert advisors, and volunteer advisors.

1.3.3. Political Context

The primary role of the councils in this study is to advise key stakeholder groups with authority or influence in the policy areas of interest to the councils. Key stakeholder groups may include oil corporations, government agencies, and elected bodies. Political context therefore plays a central role in affecting the ability of advisory councils to contribute to policy change. For the purpose of this study, *political context* is defined by the level of support which the policy proposals of the councils receive from key stakeholder groups. The role of political context has received limited attention in the empirical literature on the role of citizen advisory councils in environmental policy (Lynn and Busenberg, 1995). However, advisory councils do not usually have the authority or the resources to implement policy changes themselves. Therefore, the chances that council proposals will be implemented clearly depend on the level of support which those proposals receive from key stakeholder groups. The implementation of council proposals is likely when those proposals receive a high level of support from key stakeholder groups; less likely when those proposals receive little support from key stakeholder groups; and much less likely when those proposals are actively opposed by one or more key stakeholder groups (Sabatier and Jenkins-Smith, 1993; Jenkins-Smith, 1990).

In some cases, political conditions can even inhibit the ability of the councils to generate new knowledge and policy proposals. By withholding records or other sources of data which the councils seek to analyze, other stakeholder groups can constrain the ability of the councils to evaluate policy issues, to produce new knowledge, and to produce policy proposals (Cohen, Chess, Lynn, and Busenberg, 1995a, 1995b).

Political contexts are not immutable. When the policy positions of the advisory councils and key stakeholder groups conflict, the councils can attempt to reconcile the differing positions through a process of dispute resolution. Because the councils work in a technically intensive policy area, this process can be examined using the literature on methods for the resolution of technically intensive policy disputes.

1.3.4. Dispute Resolution Methods

Technically intensive policy disputes which revolve around competing knowledge claims are highly characteristic of environmental policy debates. However, the empirical literature cited above has given limited attention to the set of dispute resolution methods through which citizen advisory councils might attempt to overcome technically intensive policy disputes with other organizations (Lynn and Busenberg, 1995). The dispute resolution literature provides a theoretical basis for understanding the methods which advisory councils can use to address such technically intensive disputes (Blackburn, 1995, 1990; O'Leary, 1995; Crowfoot and Wondolleck, 1990; Susskind, 1994).

Issues of scientific uncertainty are often deeply embedded in environmental policy debates (Weinberg, 1972; Brooks, 1984; Jasanoff, 1987, 1990). In the presence of scientific uncertainty, groups opposing each other in a policy debate have the opportunity to generate technical knowledge claims for the purpose of gaining the advantage in the debate. *Adversarial analysis,* in which technical knowledge claims are used as tools to legitimize and support policy positions, is a common feature of environmental policy disputes (Jasanoff, 1987, 1990; Ozawa, 1991; Susskind and Ozawa, 1985; Hempel, 1996; Jenkins-Smith, 1990). However, the emergence of dueling scientists in a policy debate carries risks for the health of the policy process. In an adversary contest, information is often withheld or manipulated to aid the case of the contestant. Therefore, the knowledge claims made by any one group in the debate are suspect in the eyes of the other groups, which are wary of the potential for distortion in these partisan knowledge claims. Suspicions of manipulated knowledge claims can prevent the emergence of a consensus in the debate and deadlock the policy process (Ozawa, 1991; Susskind and Ozawa, 1985).

An alternative method for dealing with the problem of competing technical knowledge claims has been developed in the dispute resolution literature (Ozawa, 1991; Ozawa and Susskind, 1985; Blackburn, 1995, 1990; O'Leary, 1995; Crowfoot and Wondolleck, 1990; Susskind, 1994). In the *collaborative analysis* approach, the key stakeholder groups involved in a policy debate collaborate to assemble and direct a joint research team. The goal of the joint research team is to build a common foundation of knowledge acceptable to all of the participating groups. Representatives from all of the participating groups work together to select the members of the joint research team. Each representative has the opportunity to participate directly in framing the research questions and assumptions, in selecting the methods of inquiry, and in monitoring the research as it develops (Ozawa, 1991).

The principal advantage of collaborative analysis is that it reduces the chances that competing knowledge claims will deadlock the policy process. Collaborative analysis aims to accomplish this goal by building a single foundation of knowledge which is credible to all the key stakeholder groups in a policy debate. The involvement of representatives from all the key stakeholder groups in the oversight of the research process provides a means of countering suspicions among any of these groups that the other groups are manipulating the analysis (Ozawa, 1991). Therefore, collaborative analysis can aid the resolution of technically intensive policy disputes.

1.4. Summary of Conceptual Framework

The conceptual framework used in this study flows from the research questions developed in the Introduction. A central research question is whether advisory councils with access to higher levels of technical and organizational resources than the other councils studied in the existing literature might also be more effective in contributing to the policy process. A second major research question is what effect the interactions between the councils and other key stakeholder groups might have on the capacity of the councils to contribute to the policy process. The measures of council effectiveness employed in this study include the capacity of the council to secure the implementation of its proposals for policy change (a measure of effectiveness commonly found in existing studies) and the capacity of the council to contribute to the production of new knowledge (a measure of effectiveness which is new to this study). The latter

measure of council effectiveness is included in this study because advisory councils can introduce new knowledge which is useful in the policy process, even though it does not lead directly to policy changes.

The conceptual framework employed in this study includes three independent variables (or contributing factors) which may influence council effectiveness. The first contributing factor is technical and organizational resources. These council resources are frequently identified in the existing literature as variables influencing council effectiveness. The second contributing factor is political context, defined as the level of support given by key stakeholder groups to council proposals for policy change. This second variable is not fully explored in the existing literature, but is clearly an important consideration given that advisory councils generally lack the authority or resources to implement their proposals for policy change. The third contributing factor is the use of dispute resolution methods to resolve disagreements between the councils and other stakeholder groups. Because the councils in this study work in a policy area involving complex questions of science and technology, the focus of this variable is on the resolution of technically intensive policy disputes. Again, the effect of this variable has not been fully explored in the existing literature.

The conceptual framework developed above includes variables which can only be fully and accurately measured through research methods which reveal the specific details of the policy process. The research methods used for this purpose are explored in the next chapter.

information, members of the initial set of respondents were asked to think of other respondents who could provide the information in question. Often, the respondents would volunteer this information without being asked. This chain sampling strategy allowed the investigator to obtain information missing from the initial interview data. As the study progressed, the investigator identified a series of policy debates involving the councils and other stakeholder groups. In examining these policy debates, the investigator sought out interviews with respondents from the councils and key stakeholder organizations who had been directly involved in these debates.

The investigator requested interviews with 69 people. 68 (99%) of these people agreed to be interviewed. The investigator conducted field interviews with 50 respondents, and telephone interviews with an additional 19 respondents. As the study progressed, the investigator also interviewed 7 respondents initially interviewed in the field a second time by telephone to gather additional information. The content of the interviews varied widely from respondent to respondent. Some of the respondents provided a broad discussion of the work of the councils, while other respondents provided details on specific policy debates involving the councils and other stakeholder groups.

Table 2.1 displays the organizational affiliations of the interview respondents in summary form. Complete details on the organizational affiliations and titles of the interview respondents are listed in Appendix A. Interviews were conducted with council members, council staff, oil industry representatives, state regulators, federal regulators, and contractors. The oil industry representatives were employed by corporations involved in various aspects of the oil trade (including oil production, oil shipping, and oil spill response). These respondents included the manager of marine affairs in Alaska for the British Petroleum Company, the port operations coordinator of SeaRiver Maritime (an oil shipping company which is a subsidiary of the Exxon Corporation), the director of Alaskan maritime affairs at ARCO Marine (an oil shipping company which is a subsidiary of the Atlantic Richfield Company), environmental scientists at the UNOCAL Corporation, contingency planning managers at the Tesoro Alaska Petroleum Company, the director of the Maine Petroleum Association, managers and environmental scientists working for the Alyeska Pipeline Service Company, an environmental scientist at Chevron, an attorney with the Marine Spill Response Corporation, and the general manager of Cook Inlet Spill Prevention and Response Incorporated. Interviews were also held with representatives of state environmental protection agencies with jurisdiction over marine oil spill prevention and response. These respondents included managers and environmental specialists from the Alaska Department of Environmental Conservation, the director of the Office of Oil Spill Prevention and Response in the California Department of Fish and Game, and the director of the division of response services in the Maine Department of Environmental Protection. Furthermore, interviews were held with representatives of federal agencies with jurisdiction over the environmental management of the marine oil trade. These respondents included commanding and executive officers in the U.S. Coast Guard Marine Safety Offices in the ports of Valdez and Anchorage in Alaska, and the port of Portland in Maine; an oil spill response specialist in the National Oceanic and Atmospheric Administration office in Anchorage, Alaska; an environmental engineer in the U.S. Environmental Protection Agency office in Durham, North Carolina; and the U.S. Environmental Protection Agency liaison to the Joint Pipeline Office in Anchorage, Alaska. Finally, three interviews were held with contractors who worked on a research project jointly sponsored by the Prince William Sound council and the oil shipping corporations operating in Prince William Sound.

A larger number of interviews were held with respondents involved in the work of the Alaskan councils than with respondents involved in the work of the Maine and California councils (Table 2.1). For reasons explored in the findings of this study, the Alaskan councils have been exceptionally active in the policy process, and a relatively large number of interviews were required to obtain the necessary information on their accomplishments.

2.3. Mail Survey

While the goal of the interviews was to obtain perspectives on the work of the councils from different vantage points (including council members and staff, government regulators, and oil industry representatives), the goal of the mail survey was to generate a profile of the activities, backgrounds, and views of all the council members.

The mail survey sample was built using mailing lists provided by the councils. The mail survey was sent to a total of 56 council members. 43 responded, yielding an aggregate response rate of 77%. The response rates to the mail survey varied between the four councils in this study. Response rates by council are displayed in Table 2.2.

The surveys were designed and administered using the Total Design Method (Dillman, 1978). The aim of the Total Design Method is to increase response rates through careful survey construction and repeat mailings to nonrespondents.

2.4. Document Analyses

This study used a number of the documents produced by the councils as an additional source of information on the work of the councils. These documents included annual reports, newsletters, consultant reports, and educational materials. The investigator read all of the annual reports, newsletters, and educational materials produced by the councils, as well as selected consultant reports commissioned by the councils. Information from these documentary materials were used to cross-check the interview data, to assign dates to specific events, and to provide technical information which was not available from the interview data.

2.5. Data Analysis

Written notes were taken on key points which emerged in the course of the interviews. These notes were used to construct a preliminary set of findings while the interviews were transcribed. The interview transcripts were then read twice and used to construct the framework of the argument contained in this study. A series of reports produced by the advisory councils were examined to cross-check the information from the interviews and to provide further information which was then incorporated into the findings of this study.

The quantitative data from the mail surveys was entered into a database using the statistical program *SPSS*. Qualitative comments on the mail surveys were transcribed, read, and incorporated into the findings of this study. A full reliability check was then performed on all of the quantitative mail survey data in the database. Following the reliability check, statistical

analyses were conducted using *SPSS,* and the information obtained was incorporated into the findings of this study. Because the purpose of the mail survey was to provide comparisons between the four councils, the unit of analysis was the council rather than the individual council member. Since there were only four councils in this study, the statistical analyses of the mail survey data were limited to frequencies and means.

2.6. Summary of Research Methods

A case study approach is used to examine the work of the four citizen advisory councils in this research project. The case study approach is chosen because it allows a highly detailed examination of the achievements of the councils and the interaction between the councils and other stakeholder groups in the policy process over time. The specific methods employed in this study include interviews, document analyses, and a mail survey. Field and telephone interviews were conducted with 69 respondents representing the councils, the oil industry, and government agencies. Documents produced by the councils were also collected and analyzed to cross-check the interview data and to provide additional data not available from interview respondents. Finally, a mail survey was administered to all of the council members to gather information on their activities, views, and backgrounds. The three chapters to follow (Chapters III-V) examine in detail the work of each of the four councils in this study. A comparative analysis of the work of these councils is developed in Chapter VI.

Table 2.1.

Organizational Affiliations of Interview Respondents

Organizational Affiliation	*Advisory Council**			
	PWS RCAC	*CIRCAC*	*OSAC*	*TAC*
Council Member	3	4	4	3
Council Staff	7	4	0	0
Oil Industry	9	6	2	2
Federal Government	5	3	2	0
State Government	5	2	2	2
Local Government	1	0	0	0
Contractors	3	0	0	0
Total	33	19	10	7

**Abbreviations*

PWS RCAC = Prince William Sound Regional Citizens Advisory Council
CIRCAC = Cook Inlet Regional Citizens Advisory Council
OSAC = Maine Oil Spill Advisory Committee
TAC = California Oil Spill Technical Advisory Committee

Table 2.2.

Mail Survey Response Rates

*Advisory Council**	*Number Surveyed*	*Number of Responses*	*Response Rate*
PWS RCAC	19	13	68%
CIRCAC	10	8	80%
OSAC	14	13	93%
TAC	13	9	69%
Total	*56*	*43*	*77%*

Abbreviations

PWS RCAC = Prince William Sound Regional Citizens Advisory Council
CIRCAC = Cook Inlet Regional Citizens Advisory Council
OSAC = Maine Oil Spill Advisory Committee
TAC = California Oil Spill Technical Advisory Committee

III. THE PRINCE WILLIAM SOUND REGIONAL CITIZENS ADVISORY COUNCIL

3.1. Introduction

The formation of the Prince William Sound Regional Citizens Advisory Council (RCAC) began in the immediate aftermath of the 1989 *Exxon Valdez* disaster. The RCAC was initially created as a cooperative project between a group of concerned citizens in the Sound and the Alyeska Pipeline Service Company (*Alyeska*).[2] The members of the council were chosen by local governments and interest groups (including environmental organizations, the fishing and aquaculture industries, tourism and recreation organizations, and native organizations) in the region impacted by the *Exxon Valdez* oil spill (the formation of the Prince William Sound council is described in Ginsburg, Sterling, and Gotteherer, 1993). In 1990 the Prince William Sound RCAC incorporated as a nonprofit organization, signed a contract with Alyeska, and was certified as a volunteer group satisfying the participation requirements of the Oil Pollution Act. The contract with Alyeska contained four provisions which were intended to secure a prominent and lasting position for the RCAC in the policy process (these provisions are recorded in Prince William Sound RCAC, 1996a). These provisions stated that:

1) the Prince William Sound RCAC would operate independently from Alyeska,
2) the contract would last for as long as crude oil flowed through the Trans-Alaska Pipeline,
3) the Prince William Sound RCAC would be funded by Alyeska throughout its lifetime,
4) the Prince William Sound RCAC would have full access to Alyeska facilities.

The Prince William Sound RCAC would soon became a major actor in the policy debates over the environmental management of the oil trade in the Sound.

3.2. Council Resources and Knowledge Production

In its contract with the Prince William Sound RCAC, Alyeska agreed to provide the RCAC with approximately 2 million dollars in annual funding, which the RCAC would use at its own discretion (though within the boundaries of the Oil Pollution Act). In the years 1990 through 1996 the Prince William Sound council received a total of 15.1 million dollars in discretionary funding (the funding contracts of the RCAC are recorded in Prince William Sound RCAC, 1993c). The RCAC has used this discretionary funding primarily to support staff, technical consultants, and research projects. This funding has played a direct role in allowing the RCAC to produce new knowledge, both by allowing the RCAC to support a paid staff organization with 16 members, and by allowing the RCAC to hire technical consultants (the staff members of the RCAC are listed in Prince William Sound RCAC, 1996a). In the years 1990 through 1996, the RCAC sponsored 55 research projects on the environmental management of the marine oil trade (the titles of these research projects, and the names of the contractors who performed them, are

[2]Alyeska operates the Trans-Alaska Pipeline and the marine oil terminal in the Sound on behalf of seven owner companies involved in oil production and shipping in Alaska.

listed in Prince William Sound RCAC, 1991a, 1992a, 1993a, 1994a, 1995a, 1996a). A review of the summaries of these research projects reveals that all of these projects have required funding for technical consultants (summaries of these research projects are found in Prince William Sound RCAC, 1991a, 1992a, 1993a, 1994a, 1995a, 1996a). The interviews also pointed towards funding as a critical factor in allowing the RCAC to contribute to the policy process.

The interviews and document analyses allowed the investigator to identify the major research projects undertaken by the Prince William Sound RCAC. These research projects are described in the following sections. The interviews also allowed the investigator to identify five cases in which the RCAC generated major proposals for policy change. In each of these five cases, interviews and document analyses were used to trace the interaction between the RCAC and other key stakeholder groups as the RCAC sought to secure policy change. These five cases demonstrate the importance of both council resources and political context in shaping the ability of the council to achieve policy change. One of these cases also demonstrates the importance of dispute resolution methods in allowing the council to achieve policy change despite initial resistance from other stakeholder groups.

3.3. The Valdez Air Quality Dispute

During 1992 and 1993, Alyeska and the Prince William Sound RCAC engaged in a protracted dispute over the effect of crude oil vapor emissions from the Valdez marine oil terminal on the air quality of the nearby city of Valdez.[3] The focus of the dispute was on a series of air quality studies commissioned by Alyeska (referred to as the *Valdez Air Health Studies*). The Alyeska air health studies examined the levels and sources of airborne volatile organic compounds (including benzene, a known human carcinogen) in the city of Valdez. Both the council and Alyeska anticipated that this information might play a role in future regulation of air emissions from the Valdez oil terminal (the design and intent of the study are described in Prince William Sound RCAC, 1992d). Alyeska commented on the intent of the air health studies in a 1992 letter to the maritime division of the Chevron corporation (Alyeska Pipeline Service Company, 1992).

> As you are aware, Alyeska has undertaken a major air health study in Valdez. Our main objective is to determine if there is a health risk for the people of Valdez. A secondary benefit of this study may well be that we can use the results to argue against installing a vapor recovery system.

In 1992 the RCAC employed a panel of scientists to evaluate the findings of the Alyeska air health studies. The panel of scientists convened by the council agreed with the findings of the Alyeska air health studies regarding the levels of ambient airborne benzene present in Valdez, but disagreed with the findings of these studies regarding the source of the benzene emissions. One component of the Alyeska studies was designed to track the movement of benzene emissions from the terminal by using a tracer gas. The tracer gas in the Alyeska studies had been released from a site approximately one kilometer away from the tanker berths at the terminal. The science team assembled by the RCAC claimed that the tracer gas should have been released

[3] The purpose of the Valdez oil terminal is to load crude oil onto the tankers which sail the waters of the Sound.

from the tankers themselves, since the tankers were the major source of benzene emissions from the terminal (a detailed description of the views of the RCAC science team is contained in Prince William Sound RCAC, 1992d).

While the scientists who produced the Alyeska air health studies concluded that approximately 75% of the benzene found in the outdoor air of Valdez was being emitted by sources other than the oil terminal (including cars, gas stations, and woodstoves), the team of scientists hired by the advisory council estimated that 90% of the benzene found in the outdoor air of Valdez was being emitted by the oil terminal. The scientists employed by Alyeska and the RCAC also produced different interpretations of the terminal's contribution to the lifetime cancer risk of the inhabitants of Valdez. While the scientists employed by Alyeska estimated this risk at 1.7 in one million, the team of scientists hired by the RCAC estimated this risk at between 20 and 110 in one million (the conflicting interpretations of the Valdez Air Health Studies are recorded in Prince William Sound RCAC, 1992d). The Valdez air quality debate had become a classic case of adversarial analysis in action.

In 1992 the RCAC passed a resolution recommending that Alyeska voluntarily install vapor control systems at the oil terminal. In response, the president of Alyeska wrote a letter to the council in which he stated that Alyeska would not install vapor controls unless a significant health risk could be attributed to terminal sources, or unless Alyeska was required to do so under new government regulations (the council resolution and the response of the president of Alyeska are recorded in Prince William Sound RCAC, 1992a, 1993b). The council's proposal for the installation of new vapor controls at the terminal remained blocked by an unfavorable political context until 1994. There were three key stakeholder organizations with the authority to cause the installation of vapor controls at the terminal: Alyeska, the U.S. Environmental Protection Agency (EPA), and the Alaska Department of Environmental Conservation (ADEC). Alyeska directly opposed the council proposal, and neither the EPA nor ADEC formed a policy position on this issue until 1994. The U.S. Clean Air Act Amendments of 1990 gave the EPA the authority to create new regulations on airborne emissions from marine vessels, including those docked at marine oil terminals. However, the EPA did not complete its proposed federal rule for marine vessels until 1994. This lag played a central role in creating an unfavorable political context for the RCAC's proposal from 1992 to 1994, in that both ADEC and Alyeska were reluctant to take actions which might later be preempted by the new EPA regulations. Under the U.S. Clean Air Act, ADEC regulations could not be less stringent than the EPA regulations. Therefore, ADEC decided to allow the EPA to regulate air emissions from the Valdez oil terminal. Alyeska refused to install vapor emission controls at the terminal unless and until the EPA regulations had been promulgated, due to the possibility that Alyeska might install technology which would not meet the EPA standards.

The use of adversarial analysis by the RCAC and Alyeska did not help to resolve this debate, since neither side would accept the other's technical knowledge claims as a valid basis for policy decisions. This climate of suspicion essentially deadlocked the Valdez air quality debate until 1994 (the continued irresolution of the debate is noted in Prince William Sound RCAC, 1994c). By 1993 the RCAC and Alyeska had both recognized that the adversarial approach to analysis was not helping them to resolve the dispute. The two parties agreed in concept to break the impasse by conducting a joint study of the fate of benzene emissions at the oil terminal in Valdez. The joint air study was to be conducted by a single team of scientists overseen by a joint policy group, which would include participants from Alyeska and the council

(the plans for the joint air study are recorded in Prince William Sound RCAC, 1993d). The joint air study would have been the first opportunity for the council to make use of collaborative analysis as a means to resolve a technically intensive policy dispute.

However, in 1994 the EPA issued draft regulations for emissions from marine vessels under the 1990 Clean Air Act Amendments. The proposed regulatory actions of the EPA led Alyeska to commit to the installation of vapor controls at the terminal by 1997, and also led the RCAC to abandon the joint air study (the decision of Alyeska to install vapor controls at the Valdez oil terminal is recorded in Prince William Sound RCAC, 1994b). The standards applied by the EPA for marine vessels were based on the reduction of total air emissions, rather than on a risk assessment of health effects from emission sources. Since the Valdez air quality dispute had focused on the health effects of benzene emissions, the EPA regulatory proceedings essentially superseded the debate between the council and Alyeska. The draft EPA regulations indicated that the Valdez oil terminal would soon be required to employ vapor control technology which would reduce hazardous air emissions (including benzene) by at least 95%. In 1994 the RCAC therefore decided not to pursue the joint air study with Alyeska. In justifying its decision, the RCAC cited Alyeska's commitment to install vapor controls by 1997 (the policy outcome which the council had been seeking). The council also cited the fact that the results from the joint air study would be relevant to health standards, but not to the total emission standards being applied in the marine vessels rule under the Clean Air Act Amendments of 1990 (the draft EPA rule, and the decision of the council to decline the joint air study, are both recorded in Prince William Sound RCAC, 1994c).

In 1995 the EPA promulgated a final rule which required Alyeska to deploy vapor control systems at the Valdez oil terminal by 1998. The system was expected to reduce total emissions of hazardous air pollutants at the Valdez oil terminal by 90% between 1998 and 2010 (the content of the final EPA rule is recorded in Prince William Sound RCAC, 1995d). The system was installed in 1997.

The Valdez air quality debate illustrates the importance of political context in shaping the ability of the RCAC to contribute to policy change. Initially, the RCAC encountered a political context which did not favor the council's proposal to have vapor control systems installed at the Valdez oil terminal. Alyeska refused to voluntarily install these systems, and neither the state or the federal regulators with jurisdiction in this policy area required Alyeska to do so. The competing technical knowledge claims made by the council and Alyeska did not help to resolve the dispute. However, the political context shifted once the EPA began forming a policy position on the regulation of airborne emissions from marine vessels. Ultimately, the regulatory actions of the EPA superseded the debate between Alyeska and the advisory council, and decided the issue in favor of the council's position.

The adversarial approach to analysis used by the RCAC and Alyeska in the Valdez air quality dispute proved counterproductive. When another technically intensive policy dispute arose between the council and the oil industry in 1995, both sides decided to resolve this new dispute through a collaborative rather than an adversarial approach to analysis.

3.4. Tug Vessels in Prince William Sound

In 1991 the Prince William Sound RCAC began studying the tug escort system in the Sound. The Oil Pollution Act of 1990 required tug escorts for all laden oil tankers during their passage from the oil terminal at Port Valdez to the Gulf of Alaska. The purpose of the tug escorts was to provide assistance in the event that a laden oil tanker became disabled through the loss of propulsion or steering. By helping disabled tankers to avoid drifting onto reefs, rocks, or shorelines (events known as *groundings*), tug vessels provided a safeguard against oil spills caused by tankers running aground (the nature of the tug escort system, and the interest of the council in the system, is recorded in Prince William Sound RCAC, 1991, 1993e).

In 1991 the RCAC raised concerns over the risks posed by oil tanker transit in the Valdez Narrows, a strait less than a mile wide through which laden oil tankers passed after being loaded with cargo from the Valdez oil terminal. The council identified two key questions regarding the ability of tug escorts to save a disabled tanker from grounding in the Valdez Narrows. The first question was whether a class of uniquely maneuverable tug vessels called *tractor tugs* would provide a wider margin of safety against the possibility of a disabled tanker grounding in the Narrows when compared to the conventional tug vessels then used by the oil industry in the Sound. The second question was whether the practice of tethering a tug vessel to each laden oil tanker in transit through the Narrows would provide a wider margin of safety against the possibility of a disabled tanker grounding there. The purpose of the tether was to reduce the amount of time it would take for the tug vessel to begin assisting the tanker in the event of an emergency. Furthermore, the council expressed concerns that severe weather conditions might cause a disabled tanker to run aground on the islands which formed the Hinchinbrook Entrance, where the protected waters of Prince William Sound gave way to the open seas of the Gulf of Alaska (the concerns of the RCAC on the limits of the tug escort system are recorded in Prince William Sound RCAC, 1991c, 1995f).

In 1991 the RCAC proposed a study of oil tanker navigation and escort operations to answer the questions discussed above. The intention of the *Disabled Tanker Towing Study* (referred to here as the towing study) was to examine the ability of the tug escort system in the Sound to save a disabled tanker from grounding under extreme conditions. In 1992 the RCAC, U.S. Coast Guard, ADEC, and two oil industry consortiums (Alyeska and the Prince William Sound Tanker Association) agreed to pursue the towing study as a collaborative effort. The council contributed approximately 61% of the direct costs of the study. The rest of the direct costs of the study were provided by the Prince William Sound Tanker Association. The oil industry also contributed the indirect costs of vessel time for full-scale trials which provided data for the computer models employed in the towing study (the sources of support for the towing study are recorded in Prince William Sound RCAC, 1991c, 1994e).

The results of the towing study (released in 1994) led directly to a series of changes in oil tanker navigation and escort procedures in the Sound. The results of the towing study demonstrated that there were certain extreme conditions under which a fully laden oil tanker could run aground in the Valdez Narrows despite the assistance of the existing tug escort system. Those conditions involved the loss of propulsion and steering aboard a laden oil tanker in high winds. In 1994 the U.S. Coast Guard also issued a new rule which required that the tug escort system in the Sound be able to control a tanker and prevent it from grounding in the event of steering or propulsion failures. The information provided by the towing study revealed the

changes which would be needed to meet the intent of the Coast Guard rule. Therefore, in 1994 the oil shipping companies in the Sound adopted a series of changes in oil tanker navigation and escort procedures based on the information generated by the towing study. The shipping companies reduced the speed of laden oil tankers in the Narrows by 1 knot (nautical mile per hour)[4], and tethered a tug escort to the stern of each laden tanker in the Narrows. Furthermore, the shipping companies began to match tug escorts to tankers by size (whereas before tug escorts had simply been assigned to tankers based on availability), and began assigning additional tug escorts to laden tankers in high wind conditions. Finally, in 1995 the oil industry began training all of the oil tanker and tug vessel masters in the Sound using full-scale disabled tanker drills. The purpose of these drills was to allow the crews of the tankers and tug vessels to improve their performance in dealing with a disabled tanker under some of the conditions envisioned in the towing study (the policy changes made in response to the towing study are recorded in Prince William Sound RCAC, 1994e, 1995f).

Prior to the towing study, the U.S. Coast Guard Marine Safety Office in Valdez (*MSO Valdez*) had established wind restrictions in the Valdez Narrows and at Hinchinbrook Entrance to prevent oil tankers from sailing in dangerously high winds. In 1994, MSO Valdez used information from the towing study to generate new wind restrictions on tanker traffic in these two areas of the Sound. First, MSO Valdez reduced the wind limit in the Valdez Narrows from 40 knots to 30 knots for laden oil tankers heavier than 150,000 deadweight tons. Furthermore, MSO Valdez extrapolated the results of the towing study in an attempt to assess the risks of a disabled tanker grounding at the Hinchinbrook Entrance. Based on this extrapolation of the towing study, MSO Valdez reduced the wind limit at Hinchinbrook Entrance from 60 knots to 45 knots for all tankers (the new wind limits are recorded in Prince William Sound RCAC, 1994e, 1995f).

But while the towing study led directly to a series of significant policy changes, it also set the stage for a major policy dispute between the Prince William Sound RCAC and the oil industry. Following the release of the towing study in 1994, the council recommended that new tractor tug vessels with advanced maneuvering capabilities be deployed in the Sound to provide a wider margin of safety against the possibility of a disabled tanker grounding in the Valdez Narrows. The council also recommended the deployment of a more powerful tug vessel in the Sound to provide a wider margin of safety against the possibility of a disabled tanker grounding at the Hinchinbrook Entrance (the council's recommendations are recorded in Prince William Sound RCAC, 1994e).

In 1995 ADEC also began pressing the oil industry to deploy new tug vessels in the Sound, citing an Alaska state law (Alaska Statute 46) which required the use of the best available technology in the oil spill prevention and response systems in the Sound (Alaska Department of Environmental Conservation, 1996; the initiative of ADEC on the best available technology requirement is recorded in Prince William Sound RCAC, 1995d). However, the question of what class of tug vessels constituted the best available technology proved highly contentious. While ADEC was trying to decide this issue, MSO Valdez approved the new tug vessel procedures instituted as a result of the towing study as satisfying the tug escort requirements of the Oil Pollution Act. The issue of further enhancements to the escort system proceeded from that point forward primarily as a dialogue between the RCAC, ADEC, and the oil industry in the Sound. The oil industry opposed the idea of deploying new tug vessels in the Sound, on the grounds that

[4] 1 nautical mile is equivalent to 1.15 standard miles.

the towing study (which simulated tanker failures occurring under extreme conditions) left important questions unanswered. First, what was the probability of a tanker failure occurring under extreme conditions? Second, what were the risks of such a failure occurring relative to the other risks presented by the oil trade in the Sound? Therefore, the oil industry argued that it was not clear that new tug vessels were a cost-effective method to reduce the overall risk presented by the oil trade in the Sound (the position of the oil industry is reported in Prince William Sound RCAC, 1995c, 1995f). In 1995 five of the oil shipping companies operating in the Sound proposed a comparative risk assessment of the oil trade in the Sound (the *Prince William Sound Risk Assessment*) to answer the questions discussed above (this proposal is recorded in Prince William Sound RCAC, 1995c).

The intent of the risk assessment was to provide a systematic identification and ranking of the risks of the oil trade in the Sound, and to develop a plan for managing those risks. The oil industry, RCAC, Coast Guard, and ADEC agreed to conduct the risk assessment as a jointly managed project (the decision of the parties to conduct this project collaboratively is recorded in Prince William Sound RCAC, 1995c). The risk assessment illustrates the use of collaborative analysis to resolve a technically intensive policy dispute between the Prince William Sound RCAC and the oil industry. The interviews revealed that the risk assessment was consciously structured by the participants to avoid the dilemma of dueling scientists which emerged in the Valdez air quality debate. In essence, the risk assessment was designed so that the participating members from the advisory council, oil industry, and government agencies could build a common foundation of knowledge which would be credible to all of the key stakeholder groups involved, and which could then be used as the basis for mutually acceptable policy decisions. As in the Valdez air quality debate, a climate of mutual skepticism pervaded the debate on new tug vessels in the Sound. This climate of mutual skepticism made it difficult for any one group in the debate to generate analyses which would be credible to the contesting groups. The collaborative approach to analysis embodied in the risk assessment was therefore structured to allow the participants to prevent suspicions of manipulated analysis. To accomplish this goal, the risk assessment was designed to minimize the possibility of hidden action by any of the participants in the conduct of the study. The risk assessment was directed throughout by a steering committee consisting of oil industry representatives, council members, and government regulators. At the beginning of the process, both the oil industry and the advisory council representatives employed expert advisors to assist them in the study. In a conscious attempt to avoid the possibility of dueling scientists, the steering committee decided to pursue the study by combining these expert advisors into a single research team. Financial contributions to the risk assessment came from three sources. The oil industry contributed 64% of the total costs, the advisory council contributed 28% of the total costs, and the U.S. Coast Guard contributed the remaining 8% of the total costs (sources of funding for the risk assessment are recorded in Prince William Sound RCAC, 1995e). The members of the steering committee also agreed to direct the study by a process of unanimous consent.

Interviews with ten people directly involved in the risk assessment revealed several benefits to the collaborative approach to analysis used in this study. First, this collaborative approach to analysis allowed the members of the steering committee and research team to learn from each other. A member of the research team noted that the steering committee met fifteen times with the research team and project managers in the course of the study. All ten of the risk assessment participants who were interviewed agreed that this process allowed the steering

committee to gain a better understanding of the technical dimensions of maritime risk assessment.

Furthermore, the research team also learned from the members of the steering committee, in that the steering committee took an active role in assuring that the data used in the risk assessment models was as complete and accurate as possible. The basic data for the risk assessment models included historical maritime records, weather data from the Sound, vessel traffic data from the Sound, and expert opinions from the maritime community in the Sound. In the course of the study, both the steering committee and research team came to the conclusion that existing maritime records were an incomplete source of data for the risk assessment models. The steering committee therefore decided to use expert opinions from the maritime community in the Sound as an additional source of data for the study. The scientists initially employed by the advisory council as technical advisors had developed a method for gathering expert opinions from mariners and using those opinions as a source of data for maritime risk assessment models. The RCAC used its extensive connections in the communities of the Sound to introduce members of the research team to mariners outside of the oil industry (including fishermen and tourboat operators) and thereby facilitated the incorporation of local knowledge into the models.

By allowing all of the participants to closely monitor and adjust the study throughout its evolution, the collaborative approach to analysis embodied in the risk assessment generated a set of results which was unanimously supported by the participating organizations. All ten of the interview respondents who participated in the risk assessment agreed that this joint study was more credible to the RCAC than a study of this issue commissioned solely by the oil industry, and that the risk assessment had to some extent allowed the steering committee members to build a common understanding of the risks of the oil trade in the Sound.

The results of the risk assessment (released in 1996) demonstrated that the tug escort system was the single most important factor in reducing the risk of major oil spills in the Sound. The executive summary of the risk assessment described the reduction in the risk of oil spills due to existing safeguards in the Sound (Prince William Sound Risk Assessment Steering Committee, 1996).

> Analysis revealed that the current system safeguards have removed approximately 75 percent of the system risk that would exist if these safeguards were not in place. The single most effective risk reduction measure to date has been the current escort system which effectively reduces potential oil outflows due to groundings.

The results of the risk assessment led directly to two major policy changes. First, the risk assessment cast doubt on the ability of the tug vessels then available in the Sound to rescue a disabled tanker from grounding at Hinchinbrook Entrance under severe weather conditions. As a direct result of this finding, the tug vessel fleet in the Sound was reinforced by a more powerful tug vessel, which was stationed at Hinchinbrook Entrance in 1997 (the deployment of this tug vessel is noted in Prince William Sound RCAC, 1997b). Second, the risk assessment identified a substantial risk associated with the tug vessel procedures which had been instituted as a result of the towing study. The risk assessment showed that a mechanical or human failure aboard a tug vessel tethered to a tanker in the Valdez Narrows could force the tanker off course and cause a grounding. In response, the oil industry decided to establish an operating procedure in which the engine of the tethered escort vessel was disengaged through the Narrows. The oil industry also added a second person to the bridge of each tethered tug vessel in the Narrows to reduce the

possibility of a human failure aboard these vessels (the risk of a powered grounding in the Narrows and the policy changes made to counteract this risk are noted in Prince William Sound Risk Assessment, 1996, and Prince William Sound RCAC, 1997a).

The risk assessment also provided reinforcement to a shift in political context which favored the deployment of tractor tug vessels in the Sound. One of the goals of the risk assessment was to compare the ability of tractor tug vessels and conventional tug vessels in preventing a disabled tanker from grounding in the Valdez Narrows. However, the interviews revealed that the risk assessment models were not sufficiently sensitive to detect significant differences in the performance of the different classes of tug vessels for this purpose. Nevertheless, in 1996 the governor of Alaska joined ADEC in pressing the oil industry to deploy the best available technology in the tug escort system in the Sound (the efforts of the governor are recorded in Prince William Sound RCAC, 1996b). In his State of the State Address on January 9, 1996, the governor of Alaska called for "the best technology available to ensure the safe transportation of oil...Alaska's goal this year is to fix any loopholes that prevent us from having the world's finest oil transportation delivery and spill prevention system in Prince William Sound." Three days later, the governor and the oil shipping corporations in the Sound announced an agreement to deploy new tug vessels in the Sound, unless the risk assessment showed that another approach would yield better results (the governor's speech and agreement with the oil shipping corporations are recorded in Prince William Sound RCAC, 1996b). By the time that the risk assessment was released it had become clear that the governor considered tractor tug vessels to be the best available technology. The results of the risk assessment reinforced the position of ADEC and the governor by demonstrating the pivotal role played by the tug escort system in reducing the risk of an oil spill in the Sound. Therefore, while the risk assessment did not directly demonstrate the need for tractor tug vessels in the Sound, it did reinforce a shift in political context which led the oil industry to agree to the deployment of tractor tug vessels in the Sound. In 1997 the oil industry awarded contracts to build two new tractor tug vessels which would be deployed in the Sound in 1999 (Alyeska Pipeline Service Company, 1997).

In sum, the interviews revealed that the dramatic policy changes which followed the release of the risk assessment resulted from a combination of two factors. The first factor was the use of a collaborative approach to analysis in the resolution of a technically intensive policy dispute. The collaborative approach to analysis embodied in the risk assessment allowed the RCAC and other stakeholder groups to build a mutually credible foundation of knowledge which was then used as the basis of policy decisions. In the end, the collaborative approach to analysis embodied in the risk assessment allowed the participants to resolve the tug vessel dispute. The results of the risk assessment led directly to the deployment of one new tug vessel in the Sound, as well as changes in oil tanker navigation and escort procedures aimed at reducing the risk of oil spills in the Sound. The second factor was a shift in political context which favored the deployment of new tug vessel technology in the Sound. In the years following the release of the towing study, both ADEC and the governor of Alaska began pressing the concept of deploying the best available technology in the tug escort system in the Sound. By the time the risk assessment was released in 1996, it was clear that the governor considered tractor tugs to be the best available tug technology. The risk assessment did not provide a clear demonstration that tractor tug vessels would outperform conventional tug vessels in reducing the risk of oil spills in the Sound. However, the risk assessment did demonstrate the pivotal role played by the tug escort system in reducing the risk of oil spills in the Sound, thereby reinforcing a shift in political

context which in 1997 led the oil industry to agree to the deployment of two tractor tug vessels in the Sound.

3.5. Weather Reporting Systems

In 1993 the Prince William Sound RCAC began promoting the deployment of new weather reporting equipment in the Sound. The council was concerned that inadequate weather reporting on conditions between the middle of the Sound and the Hinchinbrook Entrance created the possibility that a sudden onset of dangerous weather in those areas might create unsafe conditions for oil tankers in transit. At that time, vessels in transit provided the only source of weather reporting in that region, creating the possibility that the safety of an oil tanker might be jeopardized by a sudden onset of bad weather (the weather reporting gaps in the Sound are first noted in Prince William Sound RCAC, 1993c).

In 1993 the RCAC conducted a survey of oil tanker officers to gather opinions on the adequacy of the navigation and escort systems used in the Sound. The survey responses indicated room for improvement in the area of weather reporting (the survey results are reported in Prince William Sound RCAC, 1994b). The council then turned to the National Weather Service to request funding for new weather reporting equipment in the Sound. The National Weather Service informed the council that it did not have adequate funding for this purpose. However, the RCAC had succeeded in building broad political support for its proposal among key stakeholder groups in the Sound, including Alyeska, the oil shipping corporations in the Sound, MSO Valdez, and ADEC for this proposal. These stakeholder groups perceived benefits to enhanced weather reporting in that it would improve the safety of tanker transits, help the shipping corporations to avoid unnecessary delays caused by sporadic weather reporting from tankers in transit, and allow response forces to be deployed more effectively in the event of a spill.

Having built a broad base of support for the weather equipment proposal among key stakeholder groups, the council then attempted to build support among the members of the Alaska congressional delegation for this proposal. The council did this both by sponsoring a letter-writing campaign and by organizing meetings between council members and the Alaska congressional delegation. In 1994 two members of the Alaska congressional delegation responded by adding a new provision in U.S. law which provided funding for new weather reporting equipment in the Sound (this legislative action was recorded in Prince William Sound RCAC, 1994c). In 1995 this funding was used to deploy automated weather buoys at Hinchinbrook Entrance and the middle of the Sound. New weather reporting equipment was also installed at two fixed sites close to the port of Valdez (the deployment of the weather equipment was reported in Prince William Sound RCAC, 1995c).

In this case, the RCAC took the initiative on a policy proposal which received active political support from key stakeholder groups. This favorable political context facilitated the efforts of the RCAC in securing the implementation of its proposal.

3.6. Marine Fire Protection Systems

The Prince William Sound RCAC began addressing the issue of marine oil firefighting in 1991 (the issue is first recorded in Prince William Sound RCAC, 1991a). Because oil tankers had the potential to generate immense fires, the most effective marine oil firefighting strategy in the Sound involved coordinated action between multiple firefighting teams (including the Valdez Fire Department, the crews of oil tankers and tug escort vessels, and the fire brigade of the Alyeska oil terminal). In 1992 the RCAC began pursuing this issue by initiating a fire prevention task force with MSO Valdez, Alyeska, oil shipping corporations, and the Valdez Fire Department (the initiation and composition of the task force is recorded in Prince William Sound RCAC, 1995e). This task force allowed the participants to agree on a common goal for eventually enhancing fire training in the Sound. However, the issue of enhanced fire training did not become a high priority on the agendas of any of the participating organizations other than the RCAC at that time. In the end, this first task force did not secure any agreements for policy change, and dissolved in 1994 (these events are recorded in Prince William Sound RCAC, 1995e). However, the RCAC maintained its interest in this area, and sought new avenues to make the issue of enhanced marine fire training a higher priority on the agendas of the other stakeholder organizations. In 1995 the RCAC revived the task force, and commissioned a consultant study of marine fire protection in the Sound (these actions are reported in Prince William Sound RCAC, 1995e). The fire study (released in 1996) found that practically all of the fire-fighting equipment necessary for fighting a major oil fire was available in the Sound (the results of the fire study are recorded in Prince William Sound RCAC, 1997a). However, the fire study also found that the various firefighting teams in the Sound were not training together and therefore lacked direct experience in the kind of cooperative action required to deal with a major marine fire in the Sound. A particular problem identified by the fire study was a lack of training for land-based firefighters who might be called on to help fight a marine fire. Therefore, the central recommendation of the fire study was that an annual marine firefighting symposium be established in the Sound. The purpose of the symposium would be to provide joint training for all of the various firefighting teams which might be called on to fight a major marine fire in the Sound (this proposal is recorded in Prince William Sound RCAC, 1997a). Having drawn attention to the issue of marine fire training through its study, the RCAC continued to press the issue by organizing a marine firefighting symposium in Valdez in 1997. This symposium provided marine firefighting certification for land-based firefighters and a full-scale marine fire exercise involving coordinated action by multiple fire teams on an oil tanker. The council provided an estimated 66% of the funding for this symposium. The oil industry provided an oil tanker for use in the marine fire exercise. Additional services and financial contributions were provided by a wide variety of organizations, including the oil industry, the U.S. Coast Guard, the City of Valdez, the Prince William Sound Community College, and the Alaska Department of Emergency Services (support for the marine fire symposium is recorded in Prince William Sound RCAC, 1997a, 1997b).

In sum, the RCAC used its resources to advance the issue of marine fire training on the agendas of key stakeholder groups, thereby shifting the political context in favor of its proposal for policy change over time. The case of marine fire protection in the Sound provides an example of a subtle shift in political context. The RCAC never encountered active resistance to the concept of providing enhanced marine fire training in the Sound; the issue was not acted on

initially simply because it was not a high priority on the agendas of other stakeholder groups. By using its resources to promote the concept over time, the RCAC made marine fire training a higher priority issue on the agendas of key stakeholder groups, and so contributed to the ultimate implementation of policy changes in this area.

3.7. Oil Spill Response Systems

The Prince William Sound RCAC has been involved in the area of oil spill response systems since 1991 (the work of the RCAC in this area is first recorded in Prince William Sound RCAC, 1991a). The RCAC conducts comprehensive reviews of the contingency plans (*c-plans*) in the Sound. *Contingency plans* describe the measures used for marine oil spill prevention and response by those organizations involved in oil shipping. Each party operating an oil tanker in Alaskan waters must hold a contingency plan under the provisions of the U.S. Oil Pollution Act of 1990 and Alaska Statute 46. Contingency plans are also held by state and federal agencies with responsibilities for the prevention of marine oil pollution in Alaska (Alaska Department of Environmental Conservation, 1996; Oil Pollution Act of 1990; J. Beaver, J. Butler, and S. Myster, 1994; C. Wilkinson, L. Pittman, and R. Dye, 1992).

In 1994 the Prince William Sound RCAC developed a standard protocol for contingency plan review. The intent of this protocol was to promote consistency in the contingency plan review process and to provide reviewers with a framework for gauging the adequacy of the plans (the intent of the protocol is recorded in Prince William Sound RCAC, 1994b). In 1994, contractors employed by the RCAC completed reviews of all the contingency plans in the Sound (the completion of this contract is recorded in Prince William Sound RCAC, 1994b). While technical and organizational resources have played a pivotal role in allowing the RCAC to review and comment on the contingency plans, the RCAC has faced a generally unfavorable political context in attempting to enhance the contingency plans for the Sound. On two major issues the RCAC has found itself at odds with the oil industry and ADEC in its attempts to bolster the oil spill response system in the Sound. In essence, these disagreements focus on what response measures provide an adequate margin of protection in the event of another major oil spill in the Sound. The oil industry has made substantial enhancements to the response system in the Sound in the years since the 1989 *Exxon Valdez* oil spill (these enhancements are described in Kelso and Brown, 1992, and in Prince William Sound RCAC, 1993e). ADEC and the oil industry have taken the position that these enhancements satisfy the requirements of Alaska state law, and provide an adequate margin of protection in the event of another major oil spill in the Sound. However, the RCAC has sought to increase the margin of protection provided by the oil spill response systems in the Sound. First, the council has asked for the assistance of the state of Alaska in establishing a network of community-based nearshore response teams. Second, the council has proposed that ADEC and the oil industry increase the amount of storage capacity for recovered oil available in the Sound.

Nearshore response refers to the containment and recovery of spilled oil which has escaped initial containment efforts and is threatening coastlines. Nearshore response strategies rely heavily on fishing vessels and their crews to help deploy response equipment in the event of an oil spill. Alaska state laws passed in the aftermath of the *Exxon Valdez* oil spill (Alaska Statute 46) required the development of nearshore response strategies in the contingency plans

for the Sound (Alaska Department of Environmental Conservation, 1996). Beginning in 1990 the RCAC took an active role in promoting the development of these nearshore response strategies. In 1992 the oil industry began providing response training for fishing vessel crews and positioned response equipment in five coastal communities in the Sound (a discussion of the nearshore response program, and the role of the council in its development, is provided in Prince William Sound RCAC, 1992c, 1992d). The council also pressed the state of Alaska to develop community-based nearshore response systems. In community-based nearshore response systems, response equipment is prepositioned in local communities for the use of local response teams composed of volunteers. In 1992 the Alaska state legislature appropriated funds for demonstration projects along these lines, and nearshore response equipment was deployed by ADEC in the community of Seldovia for the use of a local response team (the deployment of the equipment in Seldovia is recorded in Prince William Sound RCAC, 1993e). In 1997 the council released a study which promoted the concept of creating a network of community-based nearshore response teams in Cook Inlet and Prince William Sound (a detailed description of this plan is contained in Roberston, 1997). However, despite the efforts of the council to expand the nearshore response system in the Sound, the Alaska state legislature reduced the funding available for the nearshore response program of ADEC in 1996. In 1996 ADEC announced that it would no longer provide funding for the operation and maintenance of nearshore response equipment (the decision of ADEC is recorded in Prince William Sound RCAC 1996b, 1996c). Support for community-based nearshore response systems was not forthcoming from the oil industry in the Sound, either. The council's goal of creating a community-based nearshore response network in the Sound has not yet been achieved.

The Prince William Sound council has also proposed that the oil industry deploy additional storage capacity for recovered oil in the Sound, but has not yet gained political support from the oil industry or the state of Alaska for this recommendation (the concerns of the RCAC over the available storage capacity in the Sound are recorded in Prince William Sound RCAC, 1992b, 1992d, 1994c, 1995b, 1995c, 1997b). The oil industry in the Sound has taken the position that the available storage capacity in the Sound meets the requirements of Alaska state law and provides an adequate margin of safety in the event of another oil spill. In 1995 ADEC approved the contingency plans as satisfying the storage capacity requirements of Alaska state law (the ADEC approval of the contingency plans for the Sound is recorded in Prince William Sound RCAC, 1995d).

In sum, the Prince William Sound RCAC has faced a generally unfavorable political context in its efforts to enhance the oil spill response systems in the Sound. Both the oil industry in the Sound and ADEC have taken the position that the current oil spill response systems satisfy the requirements of the law and provide an adequate margin of safety against the possibility of another major oil spill in the Sound. Therefore, the major policy changes sought by the council in the contingency plans for the Sound have not been implemented.

3.8. Monitoring Systems

The Prince William Sound RCAC has funded a long-term environmental monitoring program in the Sound since 1993. The goal of this program is to provide baseline data which can be used to determine the environmental impacts of future oil spills in the Sound. The monitoring

program examines hydrocarbon concentrations and characteristics in sediments and bivalve tissues at sites in the Sound and the Gulf of Alaska (the design and implementation of the monitoring program is described in Prince William Sound RCAC, 1993c, 1995b, 1997a).

The RCAC has also conducted a series of environmental monitoring studies in Port Valdez (the site of the Valdez marine oil terminal). In 1994 the council began supporting a ballast water monitoring program at the Valdez oil terminal. Oil tankers carry ballast water in empty tanks to stabilize the vessels when they are not carrying cargo. Some tankers carry ballast water in the same tanks used at other times to carry oil, and the ballast water in these tankers becomes contaminated by oil residues. Contaminated ballast water is treated by the ballast water treatment facility at the Valdez oil terminal and then released into the waters of Port Valdez. The council began the ballast water monitoring program in response to community concerns that oil tankers were dumping substances into the ballast water treatment plant which the plant was incapable of treating adequately. This monitoring program provides independent confirmation that the ballast water entering the treatment plant does not contain unauthorized substances, and acts as a deterrent against such dumping. The council initially used a grant from the Alaska state legislature to cover the costs of this monitoring program, and then continued the monitoring by using its own funds (the intent, design, and implementation of the influent monitoring program is described in Prince William Sound RCAC, 1994e, 1996c).

In 1995 the RCAC organized a meeting on the ecological effects of discharges from the ballast water treatment facility in Valdez. The scientists at this meeting agreed that there was no direct evidence that discharges from the facility were harming the marine ecosystem of Port Valdez (the results of the meeting are described in Prince William Sound RCAC, 1995b). The council and Alyeska then supported a joint science team which conducted a broad ecological risk assessment of Port Valdez through a comprehensive review of existing data. The study concluded that the treated discharges into the waters of Port Valdez posed a moderate risk to the marine ecosystem of the port (the results of the study are described in Prince William Sound RCAC, 1995d, 1997b).

The RCAC has monitored drills and training exercises related to the prevention of marine oil pollution in the Sound since its inception (the first monitoring activities are reported in Prince William Sound RCAC, 1991a). In 1992 the RCAC began using contractors to aid in these monitoring tasks (the first monitoring contract is recorded in Prince William Sound RCAC, 1992a). The RCAC also monitors oil spills and near-miss incidents in the Sound (the work of the RCAC in monitoring a small spill in Port Valdez is recorded in Prince William Sound RCAC, 1994d). The RCAC has established a fax system through which council staff can relay incident reports directly to council members, as well as to the communities and local interest groups represented on the council. This fax system allows the RCAC to rapidly relay information to council members and communities in the event of an oil spill. The RCAC has also developed a full emergency response plan for its actions in the event of an oil spill. Under this plan, the RCAC will relay information to the communities in the impact region, relay messages from these communities to the organizations involved in response efforts, and provide advice to the organizations involved in response efforts (the emergency response plan is described in Prince William Sound RCAC, 1994d).

In 1993 the RCAC produced and distributed information cards to all of the fishing permit holders in the Sound. One purpose of the cards was to facilitate the reporting of marine oil spills. To this end, the cards listed the numbers of the state and federal agencies which should be called to report a marine oil spill in the Sound, as well as numbers through which mariners could

communicate with the council and provide information during an oil spill. Another purpose of the cards was to help prevent collisions between fishing vessels and vessels working in the oil trade under poor weather conditions. To this end, the cards listed the radio frequencies used by oil tankers, tug escort vessels, and the U.S. Coast Guard Vessel Traffic System in the Sound (Prince William Sound RCAC, 1993d).

In sum, the monitoring programs of the Prince William Sound RCAC have produced a significant body of information on environmental conditions in the Sound, on the characteristics and ecological effects of discharges from the Valdez oil terminal, and on the training exercises conducted by the oil industry. In the event of another major oil spill in the Sound, these monitoring systems may serve to improve the efficacy of response efforts, and may also enhance the ability of scientists to assess the environmental impacts of the spill. However, while these monitoring systems have produced a significant body of new knowledge, they have not yet contributed directly to policy change. The interviews and document analyses revealed no case of a major recommendation for policy change emerging from the monitoring programs of the RCAC.

3.9. Summary of Results

The Prince William Sound RCAC has assumed a prominent position in the policy dialogue over the environmental management of the marine oil trade in the Sound. The RCAC has used its substantial technical and organizational resources to support an array of research projects on the subjects of oil tanker navigation and escort procedures, marine fire protection systems, oil spill response systems, and systems for environmental monitoring (as well as the monitoring of marine oil spill incidents and exercises). The interviews and document analyses revealed five cases in which the RCAC proposed major policy changes in the marine oil trade in the Sound, including the deployment of new tug vessels, new vapor emission controls at the Valdez oil terminal, new weather reporting equipment, improved marine fire training procedures, and improved oil spill response systems. In the first four cases, the RCAC proposals have been implemented. In the fifth case, the RCAC proposals have not been implemented. The effects of the variables of council resources, political context, and the use of dispute resolution methods on the capacity of the RCAC to contribute to the policy process are discussed throughout this chapter, and are examined again in comparative context in Chapter VI. The next chapter examines the work of the Cook Inlet RCAC, which is the sister organization of the Prince William Sound RCAC.

IV. THE COOK INLET REGIONAL CITIZENS ADVISORY COUNCIL

4.1. Introduction

The Cook Inlet Regional Citizens Advisory Council (RCAC) is mandated by the U.S. Oil Pollution Act of 1990. The Cook Inlet RCAC organized in 1991 (Cook Inlet RCAC, 1991). As the sister organization of the Prince William Sound RCAC, the purpose of the Cook Inlet RCAC is to provide advice on the environmental management of oil tanker and platform operations in the Cook Inlet region. The Oil Pollution Act also specifies that the Cook Inlet council should represent local communities and designated groups representing local interests in the Inlet (including environmental organizations, the fishing and aquaculture industries, tourism and recreation organizations, and native organizations). Each local government and designated interest group in the Cook Inlet region appoints one member of the Cook Inlet council (Oil Pollution Act of 1990, Cook Inlet RCAC, 1996a).

4.2. Council Resources and Knowledge Production

The most striking difference between the Cook Inlet RCAC and the Prince William Sound RCAC is found in their respective funding levels. The Cook Inlet council received 3.47 million dollars in discretionary funding in the years 1990 through 1996 (the funding contracts of the Cook Inlet council are recorded in Cook Inlet RCAC, 1991, 1993, 1995). This is 23% of the 15.1 million dollars in discretionary funding received by the Prince William Sound council in the same period. These differences in funding levels limit the ability of the Cook Inlet RCAC to support staff, technical advisors, and research projects.

The Cook Inlet council currently employs 6 staff members in one office located in Kenai. The Cook Inlet council also benefits from the work of 12 volunteer advisors who work on council projects alongside council members, but who are not involved in council decisions (the staff members and volunteer advisors who work with the council are listed in Cook Inlet RCAC, 1996a). Therefore, when compared to the members of the Prince William Sound RCAC, the members of the Cook Inlet RCAC have access to both fewer staff and fewer volunteer advisors to assist them in their work (a further comparative analysis of council resources is developed in Chapter VI).

The interviews and document analyses revealed a series of cases in which the Cook Inlet council has contributed to the production of new knowledge in the policy process. The Cook Inlet RCAC produced 19 research projects on the environmental management of the marine oil trade in the period 1990 through 1996 (the titles of these research projects, and the names of the contractors who performed them, are listed in Cook Inlet RCAC, 1997). The interviews and document analyses also revealed two cases in which the Cook Inlet council has proposed policy change. These cases are discussed below.

4.3. Tug Vessels in Cook Inlet

In 1996 the Cook Inlet council passed a resolution requesting the deployment of a tug vessel in the Cook Inlet region which could assist disabled oil tankers and other vessels. The oil industry in Cook Inlet opposed this proposal, on the grounds that an industry response vessel already stationed in the Inlet could be used to assist disabled tankers. Furthermore, the idea of deploying a tug assist vessel in Cook Inlet did not become a high priority on the agenda of ADEC. The U.S. Coast Guard Marine Safety Office in Anchorage (*MSO Anchorage*) expressed interest in the idea, but lacked the authority to mandate a tug vessel in the Inlet. The interviews revealed that the aforementioned groups did not perceive a pressing need for a tug assist vessel in the Inlet in large part because the dimensions of the marine oil trade in the Inlet appeared small when compared to the marine oil trade in Prince William Sound. If the volume of crude oil transported by sea was taken as a valid measure of the risk of marine oil spills, then the available data did indicate a much greater risk in the Sound. Averaged over the period 1993 through 1996, the Cook Inlet oil trade accounted for only 6% of the average annual volume of crude oil transported by sea in the Prince William Sound and Cook Inlet regions (Table 4.1) (this data is contained in Alaska Department of Natural Resources, 1997).

Therefore, the proposal of the Cook Inlet council for the deployment of a tug assist vessel in the Inlet met with an unfavorable political context. The local oil industry responded that such a vessel was unnecessary; the proposal was given a low priority on the agenda of ADEC; and the issue was not addressed by the legislature or the governor of Alaska. This unfavorable political context prevented the Cook Inlet council from securing policy change in this area. However, the council's interest in this issue played a role in encouraging the local oil industry to test and improve the towing abilities of the response vessel stationed in the Inlet.

It is useful to contrast the experience of the two Alaskan councils in arguing for the deployment of new tug vessels in their respective regions. The Prince William Sound council built analytical support for its position on new tug vessels in the Sound through the Prince William Sound Risk Assessment, and found two major political allies (ADEC and the governor of Alaska) in its efforts to have new tug vessels deployed in the Sound. By contrast, the Cook Inlet council encountered a major political opponent (the local oil industry) and no major political allies in its efforts to have a tug vessel deployed in Cook Inlet. Furthermore, the Cook Inlet council did not build analytical support for its position on the introduction of tug vessels in the Inlet.

The possibility remains that the Cook Inlet council might build analytical support for the deployment of a tug vessel in the Inlet through further research, and use this research as a means to shift political conditions in favor of its position on tug vessels. At the moment, however, this council proposal is blocked by an unfavorable political context.

Table 4.1.

Average Annual Volumes of Crude Oil Transported by Sea, Prince William Sound and Cook Inlet, 1993-1996.

Region	*Volume of Crude Oil*	*Percent of Total*
Prince William Sound	538.1 million barrels	94%
Cook Inlet	32.7 million barrels	6%
Total	**570.8 million barrels**	**100%**

Data from Alaska Department of Natural Resources, 1997. One barrel is equivalent to 42 gallons of crude oil. The period 1993-1996 was chosen because full data for the crude oil volumes shipped in the Cook Inlet region was available only from 1993 forward.

4.4. Oil Spill Response Systems

The Cook Inlet RCAC has been involved in the area of oil spill response systems since its inception. The Cook Inlet council conducts reviews of all the contingency plans for the Cook Inlet region (individual contingency plan reviews are reported in Cook Inlet RCAC, 1992, 1993, 1994, 1995, 1996a). In 1993 the Cook Inlet council developed standard protocols for contingency plan review. The intent of the protocols is to promote consistency in the plan review process and to provide reviewers with a framework for gauging the adequacy of the plans (the intent of the protocols is noted in Cook Inlet RCAC, 1993). In 1996 the Cook Inlet council released an oil spill trajectory model capable of providing rapid predictions of the movement of oil in the Inlet following a spill (the capabilities of the trajectory program are described in Cook Inlet RCAC, 1995, 1996a). The intent of this trajectory model was to allow for the swifter and more effective deployment of response forces in the event of an oil spill, and to improve the realism of response exercises in the Inlet (these applications of the trajectory program are recorded in Cook Inlet RCAC, 1996a).

The Cook Inlet council has made financial contributions to the production of *sensitive area maps* in concert with other organizations. The purpose of sensitive area maps is to aid in the identification of ecologically sensitive areas which need special protection in the event of an oil spill. Sensitive area maps are used in conjunction with oil spill trajectory models to guide the deployment of response forces during oil spills and response exercises (the purpose of the sensitive area maps is described in Cook Inlet RCAC, 1994). In 1994 the Cook Inlet council collaborated with the U.S. Coast Guard, the National Oceanic and Atmospheric Administration (NOAA), and Cook Inlet Spill Prevention and Response, Incorporated (an oil spill response corporation commonly known as CISPRI) in funding the creation of four Geographical Information System (GIS) maps showing ecologically sensitive areas in Cook Inlet at the different seasons of the year (this mapping project is reported in Cook Inlet RCAC, 1994).

In 1996 the Cook Inlet council collaborated with the Prince William Sound council, ADEC, CISPRI, and NOAA in funding the creation of four additional GIS maps showing ecologically sensitive areas in Kodiak Island at the different seasons of the year (the characteristics of the maps are described in Cook Inlet RCAC, 1996a). The Cook Inlet council has been involved in studies of *in-situ burning* (an oil spill response technique in which attempts are made to remove spilled oil by burning it on the water) in collaboration with other organizations. In 1994 the Cook Inlet council co-sponsored experimental in-situ burns of oil with Alaska Clean Seas (an oil spill response corporation), the U.S. Coast Guard, ADEC, EPA, and the Prince William Sound RCAC (the first in-situ burning experiment is recorded in Cook Inlet RCAC, 1994, and in Prince William Sound RCAC, 1994e). In 1996 the Cook Inlet RCAC co-sponsored a further study of in-situ burning with ADEC and Alaska Clean Seas. These experiments demonstrated that the use of certain in-situ burning methods allowed the near-total removal of crude oil which was heavily intermixed with sea water (the second in-situ burning experiment design is described in Alaska Clean Seas, 1995).

In 1995 and 1996 the Cook Inlet council collaborated with CISPRI and NOAA in a study of ice formation in the Inlet. This study provided information on the implications of ice formation for oil spill response strategies (under some conditions, ice can impede the movement

of response vessels in the Inlet) (the purpose and design of the ice formation study is described in Cook Inlet RCAC, 1995, 1996a).

There are several aspects of the contingency planning process in the Inlet for which the Cook Inlet council has proposed policy changes. In 1996 the council released a consultant study of the contingency planning process in the Inlet. The study was based on interviews with personnel from the oil industry, government agencies, the Cook Inlet council, and consulting firms. This study revealed a lack of coordination between the government agencies and oil corporations involved in the contingency planning process for Cook Inlet (the results of the study are recorded in Cook Inlet RCAC, 1996a, and in Environment International, 1996). Since 1993 the council has advocated the adoption of a standard format for contingency plans and the general coordination of the contingency planning process in the Inlet (the proposal is first recorded in Cook Inlet RCAC, 1993). Since 1994 the Cook Inlet council has also advocated the incorporation of oil firefighting strategies into the contingency plans. However, the council has been unable to secure policy change in either of these areas due to a lack of active support from key stakeholder organizations (including ADEC, MSO Anchorage, and the local oil industry). ADEC and MSO Anchorage view the coordination of the contingency plans as a potentially difficult task, and have therefore given priority to the production and review of contingency plans within the existing planning framework. In the absence of an initiative from ADEC or MSO Anchorage on this issue, the oil industry has no incentive to pursue further coordination of the contingency plans. Similarly, the development of marine firefighting strategies in the contingency plans for Cook Inlet has not emerged as a high priority on the agendas of key stakeholder organizations. MSO Anchorage views the development of such plans as providing only an incremental enhancement to marine fire safety in the Inlet, and has therefore given the issue a low priority in the planning process. The oil industry in the Inlet views the existing fire equipment and procedures in the Inlet as adequate.

The Cook Inlet council has also proposed that in-situ burning be used as the primary response method for oil spills in the Inlet under winter ice conditions. This proposal has not been accepted by ADEC due to concerns over the air pollution caused by in-situ burning. Finally, the Cook Inlet council has worked on the development and maintenance of community-based nearshore response systems in the Inlet. In 1997 the Cook Inlet council secured the support of the Alaska state legislature and local governments in the Kenai peninsula to establish and maintain nearshore response teams in three communities in the Inlet (these policy changes are recorded in Prince William Sound RCAC, 1997c).

In sum, the Cook Inlet council has generally encountered an unfavorable political context in its efforts to enhance the oil spill response systems in Cook Inlet. With the exception of the three nearshore response teams which are now being established in the Inlet, the council has been unable to secure the policy changes it seeks in this area.

4.5. Human Factors in Maritime Accidents

In 1993 and 1994 the Cook Inlet RCAC collaborated with the Prince William Sound RCAC in sponsoring a pilot study of human factors in maritime accidents. Consultants were hired to survey forty members of the Alaskan maritime community regarding maritime accidents caused by human errors (the intent and implementation of the pilot study are described in Cook

Inlet RCAC, 1994). The two councils shared the costs of the project equally. The results of the pilot study provided information on areas where further research was needed on the subject of human factors in maritime accidents. However, the councils did not pursue further research in this area for two reasons. First, a major national study on human factors in maritime accidents had already been undertaken by the U.S. Coast Guard. Second, the oil industry did not grant permission for interviews to take place with the crew members of oil industry vessels (the reasons why the councils did not pursue further studies on this topic are described in Prince William Sound RCAC, 1994c, and in Cook Inlet RCAC, 1993).

This case provides an example of an unfavorable political context which limited the ability of the councils to produce new knowledge. In some cases, key stakeholder organizations have the opportunity not only to oppose council recommendations, but also to withhold records or other sources of data which the councils seek to analyze. By withholding these sources of data, key stakeholder organizations can impede the ability of the councils to evaluate policy issues, produce new knowledge, and produce policy recommendations. However, the interviews and document analyses revealed no other instances in which the work of the councils was impeded because other stakeholder organizations withheld records or other sources of data. Generally, political context has played a more important role in shaping the ability of the councils to secure the implementation of their proposals for policy change than in shaping the ability of the councils to produce new knowledge and recommendations. Indeed, this study identifies several instances in which the work of the councils has been greatly enhanced by the active cooperation of the oil industry in sharing records and other sources of information. For example, the oil industry in the Sound made oil tankers and tug vessels available for full-scale trials in the Disabled Tanker Towing Study, and provided open access to their records and their vessels for use in the Prince William Sound Risk Assessment (see Chapter III). Similarly, the oil industry in Cook Inlet provided access to their oil platforms for the purposes of the oil platform safety studies of the Cook Inlet council, which are described in the next section.

4.6. Oil Platform Safety

Between 1993 and 1995 the Cook Inlet council sponsored two studies on the safety of oil platforms in the Inlet. By 1993, fourteen of the fifteen oil platforms in the Inlet had exceeded their anticipated design lives, and the council was concerned that these aging oil platforms might create a risk of oil spills (the concerns of the council are recorded in Belmar Engineering, 1993). The two oil platform studies were funded entirely by the Cook Inlet council; the oil industry allowed consultants to access the oil platforms for the purposes of the studies. The first oil platform study focused on a structural assessment of five oil platforms in the Inlet. The results of the first study (released in 1993) showed no evidence of the kind of structural weaknesses which might precipitate an oil spill among any of the five platforms studied (the design, implementation, and results of this first study are recorded in Belmar Engineering, 1993). The Cook Inlet council then funded a second study which focused on the safety of process facilities on three oil platforms in the Inlet. This report (released in 1995) concluded that the process facilities on the three oil platforms in the study were being maintained to high standards of safety (the design, implementation, and results of this second study are recorded in Belmar Engineering, 1995). In sum, the two oil platform studies did not reveal any major problems with oil platform

safety in the Inlet. Since the knowledge produced by the platform studies did not indicate a need for safety improvements aboard the oil platforms in Cook Inlet, these studies did not lead the Cook Inlet council to produce any major proposals for policy change (the results of the platform studies are recorded in Cook Inlet RCAC, 1994, 1995).

4.7. Monitoring Systems

In 1992 the Cook Inlet council initiated a long-term environmental monitoring program in the Inlet. The goal of this program was to detect chronic environmental effects of oil industry activity in the Inlet, and to provide baseline data which could be used to determine the environmental impacts of future oil spills in the Inlet. The monitoring program examines hydrocarbon concentrations and characteristics in sediments, marine life, and water at sites throughout the Inlet (the design and implementation of the program is described in Cook Inlet RCAC, 1992). In 1996 the council sponsored a study of organism abundance and community structure at intertidal sites which had been the subjects of a similar ecological study two decades earlier (the ecological studies are described in Cook Inlet RCAC, 1995, 1996a, 1996b), and began coordinating its sampling efforts with the Minerals Management Service (MMS) in a study of oil industry contaminants in Lower Cook Inlet and the Shelikof Strait (coordination of efforts with the MMS is recorded in Cook Inlet RCAC, 1996a, 1997). The council's environmental monitoring program has not detected any significant chronic effects of oil industry activity on the environment of Cook Inlet to date (the results of the program to date are described in Cook Inlet RCAC, 1996a).

In 1992 the Cook Inlet council hired a contractor to monitor drills and training exercises related to the prevention of marine oil pollution in Cook Inlet (the monitoring contract is noted in Cook Inlet RCAC, 1992a). The Cook Inlet council has also established a fax system through which council staff can relay incident reports directly to council members and volunteer advisors. This fax system allows the Cook Inlet council to rapidly relay information to council members and communities in the event of an oil spill.

In sum, the monitoring programs of the Cook Inlet RCAC have produced a significant body of new knowledge on environmental conditions in the Inlet. In the event of an oil spill in the Inlet, these monitoring systems may help to enhance the ability of scientists to assess the environmental impacts of the spill. However, while these monitoring systems have produced a significant body of new knowledge, they have not yet contributed to policy change. The interviews and document analyses revealed no case of a major recommendation for policy change emerging from the monitoring programs of the Cook Inlet RCAC.

4.8. Summary of Results

The Cook Inlet RCAC has less access to technical and organizational resources than its sister organization in Prince William Sound. However, the Cook Inlet council has used its limited resources to produce a substantial body of new knowledge on the environmental management of the marine oil trade in the Inlet. The Cook Inlet RCAC has sponsored research projects on oil platform safety, environmental monitoring, and oil spill response systems in the

Inlet. Furthermore, the interviews and document analyses revealed two cases in which the Cook Inlet RCAC has proposed major policy changes in the marine oil trade in the Inlet, including the deployment of a tug assist vessel and improvements in oil spill response systems. However, the proposals of the Cook Inlet RCAC have not been fully implemented in either of these two cases. The roles played by council resources and political context in shaping the capacity of the Cook Inlet RCAC to contribute to the policy process are discussed throughout this chapter, and are examined again in comparative context in Chapter VI. The next chapter examines the work of the Maine and California councils.

V. THE MAINE AND CALIFORNIA OIL SPILL ADVISORY COMMITTEES

5.1. Introduction

The California Oil Spill Technical Advisory Committee (TAC) and the Maine Oil Spill Advisory Committee (OSAC) work in the same policy area as the Alaskan RCACs. However, the Maine and California councils bear a closer resemblance to other advisory councils examined in the existing literature than do the Alaskan RCACs, in that their access to technical and organizational resources is very limited (Lynn and Busenberg, 1995).

While the membership composition of the Alaskan RCACs is designed to represent local municipalities and interest groups, the membership composition of the Maine and California councils is designed in large measure to represent stakeholder groups operating at the local, regional, and state levels. Unlike the Alaskan RCACs, representatives from the oil industry are included as members of the California and Maine councils. The marine shipping industry in California is represented on the California council by an environmental scientist from Chevron and a manager from the Pacific Merchant Shipping Association, while the oil industry in Maine is represented on the Maine council by managers from the Maine Petroleum Association and the Portland Pipeline Corporation (this information is contained in Oil Spill Advisory Committee, 1996 and in Oil Spill Technical Advisory Committee, 1997). The Maine council also includes two members representing the Maine fishing industry, one member representing the Maine aquaculture industry, two members representing the general public, one member representing an oil spill response corporation, five members chosen for their expertise in areas related to oil spill prevention and response (including coastal wildlife habitat, coastal geology, fisheries biology, oil spill technology, and naval architecture), and one member representing the state pilots (the composition of the Maine council is described in Oil Spill Advisory Committee, 1996). In addition to representatives from the oil shipping industry, the California council includes two members representing local governments, two members representing national environmental organizations, two members representing state government, and one member representing an oil spill response corporation (the composition of the California council is described in Oil Spill Technical Advisory Committee, 1997).

5.2. Council Resources and Knowledge Production

Differences in levels of discretionary funding create a striking contrast between the Alaskan councils and the councils in Maine and California. Like most of the advisory councils examined in the existing literature, the Maine and California councils do not have access to discretionary funds, and are therefore unable to support their own staff members or technical consultants. Furthermore, the members of the Maine and California councils have not established a network of volunteer advisors to assist them in their work. The Maine and California councils therefore depend on their sponsors for staff and technical support. However, the support these two councils receive from their sponsors is quite limited by comparison to the resources available to the Alaskan RCACs. The staff member of the Maine Department of

Environmental Protection (DEP) who supports the Maine council estimates that this council receives the equivalent of 2 months of full-time support from her each year. The staff member from the California Department of Fish and Game (Office of Oil Spill Prevention and Response) who supports the California council estimates that this council receives the equivalent of 3 months of full-time support from him each year.

In essence, the ability of the Maine and California councils to study policy issues is, for the most part, limited to the efforts of the council members themselves, while the members of the Alaskan councils are able to reinforce their own efforts by delegating tasks to staff, expert consultants, and volunteers. The contributions of the Maine and California councils to the production of new knowledge has been very limited relative to the Alaskan RCACs. The interviews and document analyses did not reveal any research projects undertaken by the Maine or California councils comparable to those undertaken by the Alaskan RCACs. The Maine and California councils have produced new knowledge only to the extent that their members have been involved in reviewing proposed actions by state agencies in the course of council meetings. The Maine council has reviewed proposed oil spill response and wildlife rehabilitation equipment purchases by the DEP, as well as the development of a Geographical Information System (GIS) by several state agencies as a means to identify ecologically sensitive areas during oil spills. The Maine council is attempting to coordinate efforts among different agencies in Maine which are developing this technology, including the DEP, the Department of Marine Resources, and the Department of Inland Fisheries and Wildlife (the work of the Maine council in this area is recorded in Oil Spill Advisory Committee, 1995, 1996). The California council has reviewed the development of oil spill contingency plans for the state of California (the work of the California council is recorded in Oil Spill Technical Advisory Committee, 1995, 1997).

The interviews and document analyses revealed no case in which the California council proposed a major change in policy. However, the interviews and document analyses did reveal one case in which the Maine council proposed a major change in policy. This case is described below.

5.3. Transboundary Oil Spill Response

In the years 1994 through 1996 the Maine council worked with the DEP, the U.S. Coast Guard, and the Maine congressional delegation to facilitate oil spill response efforts by foreign vessels in and near American waters. In 1994 members of the Maine council and the DEP attended the Regional Workshop on Transboundary Pollution Response held by the Canadian and U.S. Coast Guards in Halifax, Nova Scotia. At that workshop, the council members became aware of a provision in U.S. law that created a barrier to transboundary oil spill response efforts. A restriction in the U.S. Merchant Marine Act of 1920 (the *Jones Act*) prevented foreign vessels from offloading recovered oil in an American port after responding to an oil spill in American waters (the conference and the Jones Act restriction are described in Oil Spill Advisory Committee, 1995).

In response, the council proposed a new provision in federal law to allow the use of foreign vessels in oil spill response efforts in and near American waters. This proposal received support from all of the stakeholder groups represented on OSAC (including the fishing industry, the aquaculture industry, and the oil industry), as well as the Coast Guard Marine Safety Office in

Portland (*MSO Portland*) and the commissioner of DEP (the support of the DEP and Coast Guard is also documented in Oil Spill Advisory Committee, 1995).

In 1995 the council formally requested that a U.S. Senator from the Maine congressional delegation pursue a change in federal law to counteract the Jones Act restriction. The OSAC proposal did not encounter any political opposition, and in 1996 the Senator from Maine added a new provision in the U.S. Coast Guard Authorization Act to address the concern of the Maine council (the passage of this provision is reported in Oil Spill Advisory Committee, 1996). The new provision allowed foreign vessels to offload in American ports oil recovered from oil spills in or near American waters during emergencies (the full text of the new provision is reproduced in Oil Spill Advisory Committee, 1996).

In pursuing a change in federal law to facilitate transboundary response efforts, the Maine council encountered political conditions which were highly favorable for its proposal. Key stakeholder groups provided active support for this policy proposal, and no active opposition to this proposal emerged among the stakeholder groups. These favorable political conditions facilitated the implementation of the council's proposal for policy change.

5.4. Summary of Results

Unlike the Alaskan councils, the Maine and California councils have very little access to technical and organizational resources. These two councils have not been involved in research projects comparable to those undertaken by the Alaskan councils. The interviews and document analyses revealed only one case in which one of these two councils proposed a major policy change. In this one case, the Maine council successfully proposed a change in federal law to facilitate transborder oil spill response efforts. The role of political context and council resources in shaping the ability of these two councils to contribute to the policy process is discussed throughout this chapter, and is also examined in comparative context in the following chapter.

VI. COMPARATIVE ANALYSIS

6.1. Introduction

The purpose of this chapter is to provide a comparative analysis of the role of three independent variables (council resources, political context, and the use of dispute resolution methods) in affecting the capacity of the councils in this study to contribute to the policy process. This analysis will be performed by summarizing the data presented in chapters III-V and examining this data for patterns which would provide evidence for a causal link between the independent variables and council effectiveness (Yin, 1994). In the following section, the patterns of variation in technical and organizational resources among the four councils are compared to the patterns of variation in council effectiveness (measured both by their ability to produce new knowledge, and their ability to contribute to policy change). The patterns of variation in political context and the use of dispute resolution methods are then compared to the patterns of variation in council effectiveness.

6.2. Technical and Organizational Resources

Technical and organizational resources include funding, staff, expert consultants, volunteer advisors, and the amount of time which the council members themselves commit to the advisory process. These resources are potentially important because they can enhance the ability of the councils to study policy issues and to support their arguments for policy change. The most striking variation in resources between the four councils in this study results from differences in funding levels. The councils in this study draw funding from two major sources. First, discretionary funding is used by the councils to employ expert consultants and staff. Second, in some cases other organizations make contributions of funding to specific projects in which the councils are involved.

The two Alaskan councils in this study receive discretionary funding from the oil industry as required by the provisions of the U.S. Oil Pollution Act of 1990 (Oil Pollution Act of 1990). In the years 1990 through 1996 the Prince William Sound council received a total of 15.1 million dollars in discretionary funding (the funding contracts of the Prince William Sound RCAC are recorded in Prince William Sound RCAC, 1993c). By comparison, the Cook Inlet council received 3.47 million dollars in discretionary funding over the same period, which is 23% of the discretionary funding received by the Prince William Sound council (the funding contracts of the Cook Inlet RCAC are recorded in Cook Inlet RCAC, 1991, 1993, 1995). Both of the Alaskan councils have used their discretionary funding primarily to sponsor research projects and to build small staff organizations which support the work of the council members. By contrast, the Maine and California councils do not have access to discretionary funds, and are therefore unable to support their own research projects or staff (the lack of discretionary funding for the Maine and California councils is noted in Oil Spill Technical Advisory Committee, 1995, 1997, and Oil Spill Advisory Committee, 1995, 1996).

The differences in funding levels between the two Alaskan councils are reflected in the number of staff which the two councils employ. In every year since its inception, the Prince William Sound council has employed at least twice as many staff members as the Cook Inlet council (Table 6.1). At the end of 1996, the Prince William Sound council employed 16 staff members in two offices (located in Anchorage and Valdez), while the Cook Inlet council employed 6 staff members in one office (located in Kenai). The Alaskan councils also benefit from the work of volunteer advisors who work on council projects with council members and staff (but who are not involved in council decisions). In every year since its inception, the Prince William Sound council has benefited from the work of at least twice as many volunteer advisors as the Cook Inlet council (Table 6.2). At the end of 1996 there were 33 volunteer advisors associated with the Prince William Sound council, and 12 volunteer advisors associated with the Cook Inlet council (the names of RCAC staff members and volunteer advisors are recorded in Prince William Sound RCAC, 1991a, 1992a, 1993a, 1994a, 1995a, 1996a; Cook Inlet RCAC, 1992, 1993, 1994, 1995, 1996a).

The Maine and California councils have little access to technical and organizational resources. They do not have their own staff, but rather rely on staff time donated by the sponsoring agencies. A staff member of the state agency which supports the Maine council estimates that this council receives the equivalent of 2 months of full-time support by one staff member each year. A staff member of the state agency which supports the California council estimates that this council receives the equivalent of 3 months of full-time staff support by one staff member each year. Neither the Maine nor the California council makes regular use of volunteer advisors (lists of all of the people who work with these two councils are contained in Oil Spill Technical Advisory Committee, 1995, 1997, and Oil Spill Advisory Committee, 1995, 1996). In essence, the ability of the Maine and California councils to study policy issues is limited to the efforts of the council members themselves, while the members of the Alaskan councils are able to reinforce their own efforts by delegating tasks to staff, expert consultants, and volunteers.

Aside from the work of staff, expert consultants, and volunteer advisors, the work of the council members themselves is a valuable organizational resource. The results from the mail survey reveal significant variations in the council member's commitment of time to the advisory process (Table 6.3). On average, the respondents from the Prince William Sound council report a very high commitment of time to council work by comparison with the members of the other councils in this study. Respondents from the Prince William Sound council report committing an average of 37 hours a month to the advisory process[5], while respondents from the Cook Inlet council report committing an average of 11 hours a month to the advisory process, which is approximately one-third of the average time commitment reported by the members of the Prince William Sound RCAC.

The members of the Maine and California councils are less active in their organizations than the members of the Alaskan RCACs. The respondents from the Maine council report committing an average of 6 hours a month to the advisory process, while the respondents from the California council report committing an average of 5 hours a month to the advisory process. Therefore, on average, the members of the Maine and California councils commit one-half of the time committed by the members of the Cook Inlet council, and approximately one-seventh of the time committed by the members of the Prince William Sound council.

[5] All averages in this section are rounded to the nearest integer.

The high commitment of time reported by the respondents from the Prince William Sound council is also reflected in reported meeting participation rates from the mail survey (Table 6.4). Respondents from the Prince William Sound council report attending an average of 21 meetings in the past twelve months. In qualitative comments on the mail survey, several respondents from the Prince William Sound council noted that a number of their meetings were conducted by teleconference rather than in person. Respondents from the Cook Inlet council report attending an average of 10 meetings in the same period, which is approximately one-half of the average meeting attendance reported by the Prince William Sound council members. The respondents from the Maine council report attending an average of 5 meetings in the past twelve months, while the respondents from the California council report attending an average of 4 meetings in the same period. Therefore, over the past twelve months, the members of the California and Maine councils report attending(on average) approximately one-half as many meetings as the members of the Cook Inlet council, and approximately one-quarter as many meetings as the members of the Prince William Sound council.

In the interviews, some respondents from the Prince William Sound council suggested that this council would eventually come to rely more on the staff organization to accomplish the mission of the council. The Alaskan councils already make heavy use of consultants and staff to accomplish their goals. In fact, *all* of the major projects completed by the Alaskan councils have been undertaken using technical consultants, and so have required substantial financial support from the councils (summaries of these research projects and the names of the contractors who completed them are recorded in Prince William Sound RCAC, 1991a, 1992a, 1993a, 1994a, 1995a, 1996a, and Cook Inlet RCAC, 1997). Discretionary funding allows the Alaskan councils to pay the costs of expert consultants, project management by staff, and equipment.

Table 6.1.

Number of Council Staff, 1991-1996

Number of Staff	*Advisory Council**			
	PWS RCAC	*CIRCAC*	*OSAC*	*TAC*
1991	12	6	0	0
1992	16	7	0	0
1993	16	7	0	0
1994	15	6	0	0
1995	15	6	0	0
1996	16	6	0	0

Data from the annual reports of the Prince William Sound and Cook Inlet RCACs, as well as telephone interviews with staff of the Cook Inlet RCAC, the Prince William Sound RCAC, the Maine Department of Environmental Protection, and the California Department of Fish and Game (Prince William Sound RCAC, 1991a, 1992a, 1993a, 1994a, 1995a, 1996a; Cook Inlet RCAC, 1992, 1993, 1994, 1995, 1996a).

**Abbreviations*

PWS RCAC = Prince William Sound Regional Citizens Advisory Council
CIRCAC = Cook Inlet Regional Citizens Advisory Council
OSAC = Maine Oil Spill Advisory Committee
TAC = California Oil Spill Technical Advisory Committee

Table 6.2.

Number of Volunteer Advisors Working with Councils, 1991-1996

Number of Volunteers	*Advisory Council**			
	PWS RCAC	*CIRCAC*	*OSAC*	*TAC*
1991	28	11	0	0
1992	34	12	0	0
1993	33	12	0	0
1994	28	12	0	0
1995	35	13	0	0
1996	33	12	0	0

Data from the annual reports of the four councils (Prince William Sound RCAC, 1991a, 1992a, 1993a, 1994a, 1995a, 1996a; Cook Inlet RCAC, 1992, 1993, 1994, 1995, 1996a; Oil Spill Technical Advisory Committee, 1995, 1997; Oil Spill Advisory Committee, 1995, 1996).

**Abbreviations*

PWS RCAC = Prince William Sound Regional Citizens Advisory Council
CIRCAC = Cook Inlet Regional Citizens Advisory Council
OSAC = Maine Oil Spill Advisory Committee
TAC = California Oil Spill Technical Advisory Committee

Table 6.3.

Council Member's Commitment of Time to Advisory Process

Commitment of Time	*Advisory Council**			
	PWS RCAC	*CIRCAC*	*OSAC*	*TAC*
1-9 hours a month	0%	50%	100%	88%
10-19 hours a month	23%	38%	0%	13%
20-29 hours a month	31%	13%	0%	0%
30-39 hours a month	8%	0%	0%	0%
40+ hours a month	38%	0%	0%	0%
Total	100%	101%	100%	101%
(Number)	(13)	(8)	(12)	(8)

Survey participants were asked, "On average, about how many hours do you find yourself working each month in your position as a {advisory council} member?"

**Abbreviations*

PWS RCAC = Prince William Sound Regional Citizens Advisory Council
CIRCAC = Cook Inlet Regional Citizens Advisory Council
OSAC = Maine Oil Spill Advisory Committee
TAC = California Oil Spill Technical Advisory Committee

Table 6.4.

Number of Meetings Attended by Council Members

Number of Meetings Attended in Past 12 Months	*Advisory Council**			
	PWS RCAC	*CIRCAC*	*OSAC*	*TAC*
1-4 meetings	0%	17%	18%	75%
5-9 meetings	31%	33%	73%	25%
10-14 meetings	23%	33%	9%	0%
15-19 meetings	0%	0%	0%	0%
20+ meetings	46%	17%	0%	0%
Total	100%	100%	100%	100%
(Number)	(13)	(6)	(11)	(8)

Survey participants were asked, "How many meetings of the {advisory council} have you attended in the past twelve months?"

**Abbreviations*

PWS RCAC = Prince William Sound Regional Citizens Advisory Council
CIRCAC = Cook Inlet Regional Citizens Advisory Council
OSAC = Maine Oil Spill Advisory Committee
TAC = California Oil Spill Technical Advisory Committee

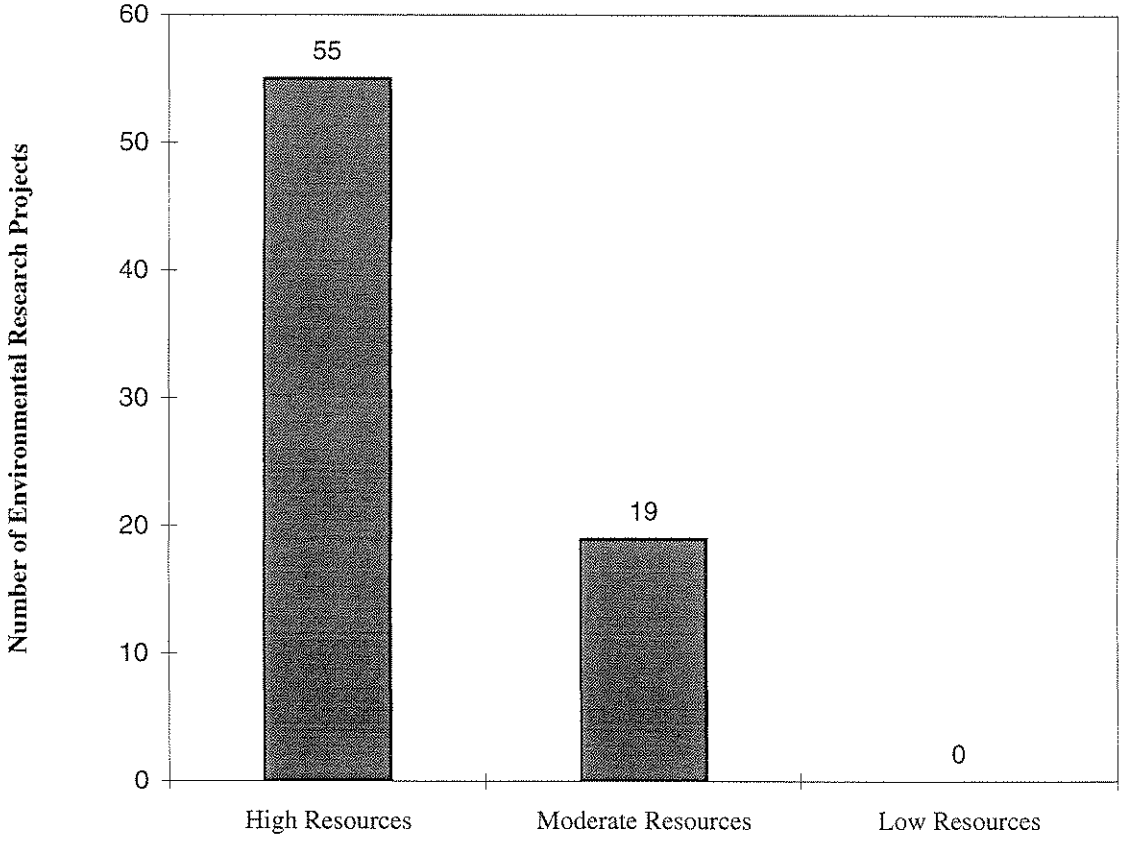
In some cases the Alaskan councils have reinforced their own resources by collaborating with other organizations in joint projects. Between 1990 and 1996 the Prince William Sound council was involved in seven joint projects in which other organizations provided major contributions of funding and equipment. These organizations included oil corporations, government agencies, and the Cook Inlet council. In this period, direct financial contributions from other organizations to the joint projects in which the Prince William Sound council was involved totaled approximately 1.87 million dollars (funding contributions from other organizations to specific projects involving the Prince William Sound council are recorded in Prince William Sound RCAC 1991c, 1994e, 1995e; additional information was obtained in interviews). In the same period, the Cook Inlet council was involved in four joint projects in which other organizations provided major contributions of funding and equipment. In this period, direct financial contributions from other organizations to the joint projects in which the Cook Inlet council was involved totaled approximately 183,000 dollars (funding contributions from other organizations to specific projects involving the Cook Inlet council are recorded in Cook Inlet RCAC, 1996c; additional information was obtained in interviews). This is approximately one-tenth the amount of the financial contributions made by other organizations to joint projects in which the Prince William Sound council was involved in the period 1990-1996. The Maine and California councils have not been involved in joint projects comparable to those undertaken by the Alaskan councils.

The four councils in this study can be ranked into three categories based on differences in their levels of access to technical and organizational resources: a *high resources* category, a *moderate resources* category, and a *low resources* category. Of the four councils in this study, the Prince William Sound council has the greatest levels of access to technical and organizational resources by all measures (including funding levels, number of staff, number of volunteer advisors, and commitment of time by council members to the advisory process). Therefore, the Prince William Sound council can be placed in the high resources category. The Cook Inlet council has more limited access to resources by all of the measures listed above. Therefore, the Cook Inlet council can be placed in the moderate resources category. Finally, the Maine and California councils have very limited access to resources by all the measure listed above. In fact, on two of the measures (funding levels and number of volunteer advisors) the Maine and California councils have no access whatsoever. On the other two measures (number of staff and time commitment by council members) the Maine and California councils have low and closely comparable scores. Therefore, the Maine and California councils can be placed together in the low resources category.

Can variations in resource rank provide an explanation for variations in the capacity of the councils to generate new knowledge in the policy process? The number of research projects sponsored by each council can be used as a measure of its ability to produce new knowledge in the policy process. In the years 1990 through 1996, the Prince William Sound council (in the high resources category) sponsored 55 research projects on the environmental management of the marine oil trade (each of these projects is listed in Prince William Sound RCAC, 1991a, 1992a, 1993a, 1994a, 1995a, 1996a). In that same period, the Cook Inlet council (in the moderate resources category) sponsored 19 research projects on the environmental management of the marine oil trade (a list of these projects is contained in Cook Inlet RCAC, 1997). The Maine and California councils (in the low resources category) were not involved in any major research projects in that period. A comparison of the patterns of variation in council resources and

number of environmental research projects provides evidence for a direct relationship between council resource rank and knowledge production (Figure 6.1). Furthermore, the case-specific evidence points to funding as a pivotal resource in allowing the councils to generate new knowledge. A review of the summaries of all of the research projects of the Alaskan RCACs reveals that each of these projects has been conducted through contracts with technical consultants (the titles of these research projects, as well as the names of the contractors who performed them, are listed in Prince William Sound RCAC, 1991a, 1992a, 1993a, 1994a, 1995a, 1996a, and in Cook Inlet RCAC, 1997). Therefore, the evidence indicates that differences in funding levels have a direct and pervasive influence on the ability of the councils to generate new knowledge in the policy process.

Figure 6.1.
Council Resources and Number of Environmental Research Projects



Does resource rank also affect the ability of the councils to secure the policy changes they propose? It can be argued that the ability to produce new knowledge might enable the councils to better support their arguments for policy change, and so increase their ability to secure the implementation of their proposals. If this proposition is correct, then a high resource rank should correlate with a high level of success in securing policy change, while a low resource rank should correlate with a low level of success in securing policy change.

This study identifies eight cases in which the councils proposed major changes in policy. The Prince William Sound council proposed major policy changes in five cases; the Cook Inlet council proposed major policy changes in two cases; and the Maine council proposed a major policy change in one case. The California council does not appear in this analysis, because this council has not produced any major proposals for policy change. Each of these eight policy proposals (and its fate in the policy process) is summarized below, drawing on the evidence presented in Chapters III-IV.

1. In 1994 the Prince William Sound RCAC proposed that new tug vessels be deployed in the Sound. This policy change was agreed upon in 1997.

2. In 1994 the Prince William Sound RCAC proposed the deployment of new weather reporting equipment in the Sound. The new weather equipment was deployed in 1995.

3. Beginning in 1992 the Prince William Sound RCAC sought to enhance marine fire training in the Sound. The first marine fire training symposium was held in the Sound in 1997.

4. In 1992 the Prince William Sound RCAC recommended that vapor emission controls be installed at the Valdez marine oil terminal. These emission controls were installed in 1997.

5. Beginning in 1990 the Prince William Sound RCAC proposed that the oil spill response systems in the Sound be reinforced through a network of community-based nearshore response teams and through the deployment of additional storage capacity for recovered oil. These changes have not been implemented to date.

6. In 1996 the Cook Inlet RCAC recommended that a tug assist vessel be deployed in the Inlet. To date, this recommendation has not been implemented.

7. Since 1993 the Cook Inlet RCAC has proposed that the oil spill response systems in the Inlet be enhanced through the coordination of the contingency planning process, the incorporation of marine fire protection strategies in these contingency plans, and the use of in-situ burning as a primary response tool in winter ice conditions. These changes have not been implemented to date. The Cook Inlet RCAC has succeeded in securing funding for three community-based nearshore response teams in the Inlet.

8. In 1995 the Maine council proposed a change in federal law to facilitate the use of foreign vessels to respond to oil spills in or near American waters. This change in federal law was implemented in 1996.

A comparison of council resource rank with the pattern of variation in the fate of council proposals in these eight cases provides a means of testing for a relationship between resource rank and the success of council proposals. If a direct relationship exists between resource rank and policy success, then a high resource rank should be correlated with high policy success, while a low resource rank should be correlated with low policy success. However, the pattern formed by these eight cases does not fit this proposition (Table 6.5). For example, the Cook Inlet council has been generally unsuccessful in both of the two cases where it has sought policy change, while the Maine council (which has a lower resource rank than the Cook Inlet council) has been successful in the one case where it has proposed a policy change. A closer examination of the cases sheds further doubt on the proposition that differences in technical and organizational resources can fully explain differences in the ability of the councils to secure policy change. In some cases, it is clear that the information produced by the research projects of the councils has played a role in generating support for policy change. The evidence presented in Chapter III demonstrates that the information produced the Disabled Tanker Towing Study, the Prince William Sound Risk Assessment, and the Marine Fire Protection Study played a role in creating support among stakeholder organizations for policy changes proposed by the Prince William Sound RCAC. However, there are other cases where such research projects have not contributed to policy change. For example, the Prince William Sound and Cook Inlet councils have expended substantial resources on contractor reviews and other studies of contingency plans for their respective regions, yet have been generally unsuccessful in securing the implementation of their proposals for policy changes in this area. Furthermore, the Maine council has been able to secure a policy change at the federal level without conducting a research project to support its position. Therefore, the evidence indicates that another independent variable must be examined to explain variations in the ability of the councils to contribute to policy change.

Table 6.5.
Council Resources and Policy Change

Resource Rank of Council	*Policy Change* *Yes*	*No*
High Resources (Prince William Sound council)	4	1
Moderate Resources (Cook Inlet council)	0	2
Low Resources (Maine council)	1	0

6.3. Political Context

The evidence presented in the previous section demonstrates that variations in council resources provide only a partial explanation of variations in the ability of the councils to secure policy change. A variable not considered in the previous section is *political context*, defined as the level of support given by key stakeholder groups to the policy proposals of the councils. The purpose of this section is to consider the role of political context in affecting the ability of the councils to secure policy change.

The previous section identified eight cases in which the councils in this study proposed major policy changes. In five of the cases, the policy changes proposed by the councils have been implemented. In the three remaining cases, the policy changes proposed by the councils have not been fully implemented. In each of the eight cases, the investigator evaluated the political context which the councils encountered when they made their proposals for policy change. Political context was measured by identifying the policy positions of the key stakeholder groups involved in each of the eight cases. The policy position of each key stakeholder group was identified through interviews with representatives from the group in question. Often, these policy positions were also recorded in the regular reports produced by the councils. In three cases, the policy positions of key stakeholder groups were found to have shifted over time. Therefore, political context was examined in two stages: the initial political context which the councils encountered when they first generated their proposals for policy change, and the ultimate political context (the policy positions of key stakeholder groups in the present day). Drawing on the evidence presented in Chapters III-V, the initial and ultimate political contexts for each of the eight cases are summarized below.

Case 1. In 1994 the Prince William Sound RCAC proposed that new tug vessels be deployed in the Sound. The stakeholder groups involved in this policy area included the oil corporations operating in the Sound, ADEC, and the Coast Guard. This proposal was opposed by the oil corporations operating in the Sound when it was first made in 1994, and did not initially receive strong support from the state of Alaska or the Coast Guard. Therefore, in 1994 the council encountered low political support for its recommendation, and the new tug vessels were not deployed. However, between 1995 and 1997 the political context shifted, in that ADEC and the governor of Alaska began to pressure the oil industry to make use of the best available technology in the tug escort system in the Sound. Therefore, by 1997 the political context had shifted in favor of the council's proposal. In 1997 the oil industry in the Sound agreed to deploy the new tug vessels which the council had been seeking.

Case 2. In 1994 the Prince William Sound RCAC began seeking the deployment of new weather reporting equipment in the Sound. Key stakeholder groups involved in this policy area included the oil corporations operating in the Sound, ADEC, and the Coast Guard. The council encountered active political support from all of these stakeholder groups for its proposal. In 1995 the council's recommendation was passed into federal law, and the new weather equipment was deployed in the Sound.

Case 3. In 1992 the Prince William Sound RCAC began seeking to establish marine fire training in the Sound. The key stakeholder groups in this policy area included the Valdez fire department, the Alyeska oil terminal fire brigade, and the Coast Guard. This case is a subtle example of a shifting political context. The concept of marine fire training was generally supported by the key stakeholder groups when the issue was raised by the council in 1992.

However, the issue of marine fire training did not initially achieve a high priority on the agenda of any stakeholder group other than the RCAC, and no policy change occurred. The council then undertook efforts to make this issue a higher priority on the agendas of other stakeholder organizations by sponsoring a study of marine fire protection in 1996, and by promoting the creation of a marine fire training symposium in the Sound. Due in large part to the efforts of the council, by 1997 the political context had shifted in favor of the council's proposal, and the issue of marine fire training had become a higher priority on the agendas of the other stakeholder organizations. The policy change which the council had been seeking was finally implemented with the successful completion of the first marine fire training symposium in the Sound in 1997.

Case 4. In 1992 the Prince William Sound RCAC sought to have vapor emission controls installed at the Valdez marine oil terminal. The key stakeholder organizations involved in this policy area included Alyeska, ADEC, and the EPA. The council's proposal met with an unfavorable political context when it was first made in 1992. Alyeska directly opposed the council's recommendation, and the government agencies with jurisdiction in this area had not yet formed policy positions on this issue. In 1994 the political context shifted in favor of the council's position with the release of the draft EPA regulations on emissions from marine vessels. The new EPA rule contained a mandate for a dramatic reduction of airborne emissions from marine vessels, essentially requiring Alyeska to install new vapor emission controls at the terminal. These vapor emission controls were installed in 1997.

Case 5. Since 1990 the Prince William Sound RCAC proposed that the oil spill response systems in the Sound be reinforced through a network of community-based nearshore response teams and through the deployment of additional storage capacity for recovered oil. The council has directed its proposals in this policy area to the oil corporations operating in the Sound and ADEC. However, these proposals have encountered low political support from the stakeholder groups to which they have been directed. The oil industry opposes the idea of further expansions in the oil spill response systems in the Sound, arguing that the present systems meet the legal requirements of the state of Alaska and provide an adequate margin of protection against the possibility of another oil spill in the Sound. ADEC has approved the current oil spill response systems in the Sound as satisfying the legal requirements of the state, and has not supported proposals for further expansion of that system. The changes sought by the council have not been implemented to date.

Case 6. In 1996 the Cook Inlet RCAC passed a resolution requesting the deployment of a tug assist vessel in Cook Inlet. The key stakeholder groups in this policy area include the Coast Guard, ADEC, and the oil corporations operating in the Inlet. This council proposal has met with low political support from these stakeholder groups. The oil corporations operating in the Inlet argue that the response vessel now deployed in the Inlet can act as an assist vessel, and therefore oppose the deployment of a tug assist vessel. The idea of deploying a tug assist vessel in the Inlet has been given a low priority on the agendas of ADEC and the Coast Guard. No tug assist vessel has been deployed in the Inlet to date.

Case 7. Since 1993 the Cook Inlet RCAC has proposed that the oil spill response systems in the Inlet be enhanced through the coordination of the contingency planning process, the incorporation of marine fire protection strategies in these contingency plans, and the use of in-situ burning as a primary response tool in winter ice conditions. These proposals have been directed to the oil corporations operating in the Inlet, ADEC, and the Coast Guard. The council's proposals in this area have met with low political support from all of these groups. The

coordination of the contingency plans for Cook Inlet is perceived as a difficult task by the Coast Guard and ADEC, and is a low-priority issue on the agendas of both of these agencies. The oil industry will not work on this issue without the lead of the regulatory agencies. The incorporation of marine fire protection strategies into the contingency plans for the Inlet has also been given a low priority on the agenda of the Coast Guard, which views such strategies as being of limited value in improving fire protection in the Inlet. Similarly, marine firefighting in Cook Inlet is a low-priority issue on the agenda of ADEC. The oil corporations in the Inlet believe that the existing firefighting equipment and procedures now available in the Inlet are adequate. Finally, ADEC has resisted the use of in-situ burning as a primary response tool due to concerns over air pollution. The Cook Inlet council has secured the support of the Alaska state legislature, ADEC, and local governments in the Kenai peninsula for its proposal to establish community-based nearshore response teams in the Inlet. Otherwise, the proposals of this council for changes to the oil spill response systems in the Inlet have not been implemented to date.

Case 8. In 1995 the Maine council proposed a change in federal law to facilitate the use of foreign vessels in oil spill response efforts in or near American waters. The key stakeholder groups in this policy area included the Coast Guard, DEP, the Maine oil industry, and the Maine fishing and aquaculture industries. This recommendation met with active political support from all of the above organizations when it was first made in 1995. This change in federal law was implemented in 1996.

There are two patterns which emerge from the data in the eight cases presented above. The first pattern is the initial political context which the councils encountered when they first made their proposals for policy change. In six cases (case 1 and cases 3-7) the councils initially encountered a low level of political support for their proposals. Initially, the councils did not secure the policy changes they sought in any of these six cases. In the remaining two cases (cases 2 and 8) the councils initially encountered a high level of political support for their recommendations. In these two cases, the councils secured the policy changes that they were seeking. The pattern of variation in initial political context is compared to the pattern of variation in policy change in Table 6.6.

Ultimately, the political context shifted in three of the cases discussed above (case 1, case 3, and case 4). In each of these three cases, the political context shifted over time from a low level of political support for council proposals to a high level of political support for council proposals. In each of these three cases, the policy changes which the councils were seeking were ultimately implemented. The pattern of variation in ultimate political context is compared to the pattern of variation in policy change in Table 6.7.

In sum, the pattern which emerges from these eight cases provides evidence for a direct relationship between political context and the ability of the councils to contribute to policy change. In both time periods, the pattern that emerges from these eight cases links political support to policy success. The councils have generally failed to secure the implementation of their proposals in each case where they have encountered low political support for these proposals. By contrast, the councils have succeeded in securing the implementation of their proposals in each case where they have encountered high political support for these proposals.

6.4. Dispute Resolution Methods

This study identified only one case in which a council made use of formal dispute resolution methods in a policy dispute with other organizations. In this one case (the Prince William Sound Risk Assessment) the interviews revealed that the use of dispute resolution methods played an important role in allowing the Prince William Sound council to secure the policy change it sought (Chapter III). However, the councils in this study have not made use of formal negotiation techniques in the other seven cases where they proposed policy changes. Furthermore, the other seven cases are a mixture of policy successes (4 cases where the policy changes sought by the councils have been implemented) and failures (3 cases where the policy changes sought by the councils have not been implemented). Therefore, the pattern that emerges from this data shows that dispute resolution methods are not a prerequisite for policy success (Table 6.8). It is possible that the further application of formal negotiation methods to resolve policy disputes between the councils and other stakeholder groups might, in the future, enhance the ability of the councils to secure the implementation of their proposals for policy change.

Table 6.6.
Initial Political Context and Policy Change

	Policy Change	
Initial Political Support	*Yes*	*No*
High Support	2	0
Low Support	0	6

Table 6.7.
Ultimate Political Context and Policy Change

	Policy Change	
Ultimate Political Support	*Yes*	*No*
High Support	5	0
Low Support	0	3

Table 6.8.
Use of Dispute Resolution Methods and Policy Change

	Policy Change	
Dispute Resolution Methods Used	*Yes*	*No*
Yes	1	0
No	4	3

6.5. Policy Context

The evidence presented in Chapters III-V demonstrates that the councils in this study have made important contributions to the policy process. The remarkable accomplishments of these councils may have been facilitated by the policy context in which they operate. In several respects, the four councils in this study are embedded in a policy context which favors their efforts to improve the environmental performance of the marine oil trade. First, oil spills from tankers in coastal waters have a high public profile. Therefore, the legal and political consequences of such spills are severe (Wilkinson, Pittman, and Dye, 1992; Mitchell, 1990). The *Exxon Valdez* spill, in particular, proved to be an extraordinarily expensive event for the Exxon Corporation, providing stark evidence that tanker spills were not only a public relations disaster but a potentially serious economic threat to the corporation responsible for the spill. In this study, respondents representing the Atlantic Richfield Corporation, British Petroleum, the Exxon Corporation, UNOCAL, the Alyeska Pipeline Service Company, the Maine Petroleum Association, and the Tesoro Alaska Petroleum Company agreed that the prevention of marine oil spills was a high priority for their corporations. While the final cost of the *Exxon Valdez* spill remains under appeal in the federal court system, interviews with representatives of the Exxon Corporation revealed that the final cost of this disaster for Exxon could be higher than eight billion dollars. State and federal laws passed in the aftermath of the *Exxon Valdez* spill raised the fines and liability limits applicable to marine oil spills, making the idea of another such spill a daunting prospect for the oil industry (Wilkinson, Pittman, and Dye, 1992; Beaver, Butler, and Myster, 1994). Therefore, the prevention of marine oil spills is a high-priority issue on the agendas of oil corporations operating in American waters. The advisory councils in this study do not have to engage in arguments with other stakeholder groups over the acceptability of major marine oil spills. The councils, oil industry, and government agencies with jurisdiction in this policy area agree that such spills should be avoided.

There are other aspects of the policy context in which the four councils operate which tend to favor their efforts to improve the environmental performance of the marine oil trade. In some respects, the structure of the oil industry tends to preclude some of the problems which advisory councils might face in other industrial contexts. For example, the councils in this study have been able to work with a relatively small number of corporate entities, thereby avoiding some of the coordination problems which might arise in industries which are less centralized. In the case of the California council, representatives from two corporations (Chevron and the Pacific Merchant Shipping Association) represent the marine shipping industry in California. The Maine council works with representatives from two corporate entities: the Maine Petroleum Association and the Portland Pipeline Company. The Cook Inlet council works primarily with two corporate entities: the Tesoro Alaska Petroleum Company and the UNOCAL Corporation. The Prince William Sound council works primarily with four corporate entities: British Petroleum, ARCO Marine, SeaRiver Maritime, and the Alyeska Pipeline Service Company. Therefore, when the councils in this study request an investment in new environmental safeguards, they are able to address a limited number of corporate entities. Furthermore, the oil industry has substantial resources at its command with which to respond to these recommendations. The interviews revealed no case in which a formal council resolution was resisted by the oil industry on the grounds that it would pose an unacceptable operating expense for the industry (even though some council proposals have involved additional expenses of tens of millions of dollars for the oil

industry). For example, the two new tractor tugs sought by the Prince William Sound RCAC are now being built at a cost of thirty million dollars (the cost of the tractor tug contract is noted in Alyeska Pipeline Service Company, 1997).

In sum, the councils in this study face a policy context which generally favors their efforts to improve the environmental performance of the marine oil trade. The *Exxon Valdez* disaster not only engendered a public relations disaster for the oil industry, but also revealed that any future spill of similar size in American waters would carry dangerous financial consequences for the spilling corporation. Furthermore, the oil industry in the four regions in this study is represented by a limited number of corporate entities with access to substantial resources which can be invested in new environmental safeguards. It can be argued that these characteristics, when taken together, tend to make the oil industry fairly responsive to proposals for new environmental safeguards by the councils in this study. The councils in this study do not have to contend with some of the problems which might face councils in other industrial contexts, such as (1) problems of coordination arising in an industry with a large number of corporate entities, (2) a lack of resources in an industry for investments in new environmental safeguards, or (3) environmental problems with low public profiles, so that the industry in question does not face major legal or political repercussions for environmental damage caused by industrial activities

6.5. Summary of Comparative Analysis

In this chapter, patterns of variation in council effectiveness were compared to patterns of variation in council resources, political context, and the use of dispute resolution methods. This comparative analysis provides evidence for a direct relationship between levels of council resources and the ability of the councils to produce new knowledge in the policy process. However, the pattern of variation in council resources does not fully match the pattern of variation in the ability of the councils to secure policy change. Therefore, the evidence does not fully support the proposition that variations in council resources are directly related to variations in the ability of the councils to secure policy changes. The variable of political context provides a more robust explanation for variations in the ability of the councils to secure policy change. Political context is defined by the support given by key stakeholder groups to the policy proposals of the councils. An examination of eight cases in which the councils have proposed major policy changes reveals evidence of a direct relationship between the level of political support for these proposals and the success of the councils in securing policy change. While the use of dispute resolution methods played an important role in enabling a council to secure the implementation of its policy proposals in one case, a comparative analysis of the other seven cases shows that the use of dispute resolution methods is not a precondition for policy success.

An examination of the policy context in which these four councils operate reveals several characteristics which tend to favor the efforts of the councils to improve the environmental performance of the marine oil trade. The high political and legal costs of oil spills in American waters make the oil industry relatively responsive to policy proposals which will reduce the risk of such spills. Furthermore, the councils in this study have been able to work with a relatively small number of corporate entities, thereby avoiding the type of coordination problems which might arise in an industry with a large number of corporate entities. Finally, the industry which these councils oversee has substantial resources available to invest in new environmental

safeguards. Therefore, economic feasibility has not emerged as a barrier to the policy proposals made by these councils. In sum, the policy context in which these four councils are embedded favors their efforts to improve the environmental performance of the marine oil trade, and may help to account for the remarkable success of these councils in contributing to the policy process.

VII. CONCLUSIONS

7.1. Summary of Results

The purpose of this study was to evaluate the effectiveness of citizen advisory councils as a means for improving environmental policy decisions through citizen participation. This study sought to answer two questions. First, to what extent could citizen advisory councils make tangible contributions to the policy process? Second, what were the factors affecting the ability of advisory councils to contribute to the policy process? This study sought to answer these questions through case studies of four citizen advisory councils whose work centered on the prevention of marine oil pollution.

This study employed three methods of inquiry. First, open-ended interviews with 69 respondents were used to obtain perspectives on the work of the advisory councils from the vantage points of council members, council staff, and representatives from the key stakeholder groups involved in the work of the councils (including government agencies and the oil industry). Second, reports published by the councils were analyzed to provide additional details on their work. Finally, a mail survey was used to generate a profile of the activities, backgrounds, and views of the council members.

This study demonstrates that citizen advisory councils are capable of making important contributions to the production of new knowledge in the policy process. The Prince William Sound council has made important contributions to the production of new knowledge through studies of oil tanker and tug vessel operations, marine oil firefighting, oil spill response systems, and environmental conditions in the Sound. The Cook Inlet council has made important contributions to the production of new knowledge through studies of oil platform safety, oil spill response systems, and environmental conditions in the Inlet.

This study also demonstrates that citizen advisory councils are capable of making important contributions to the implementation of new environmental safeguards in the marine oil trade (including new laws, regulations, procedures, and equipment). The work of the Prince William Sound council has contributed to several major enhancements in the environmental safeguards employed in the marine oil trade in the Sound. These new safeguards include changes in oil tanker navigation and escort procedures, the deployment of new tug escort vessels, the deployment of new weather reporting equipment, and the creation of a training symposium for marine firefighting. The work of the Maine council has contributed to the passage of a new provision in U.S. law which facilitates transboundary oil spill response efforts.

Technical and organizational resources play a key role in affecting the ability of the councils to produce new knowledge, and in some cases also affect the ability of the councils to contribute to policy change. Technical and organizational resources include funding, staff, expert consultants, volunteer advisors, and the amount of time which the council members themselves commit to the advisory process. Technical and organizational resources enhance the ability of the councils to study policy issues and to support their arguments for policy change. For example, all of the research projects undertaken by the councils in this study have required financial support from the councils to pay the costs of expert consultants and project management by staff.

Among the four councils in this study, the Prince William Sound council has the greatest levels of access to technical and organizational resources. This is due primarily to the high level of discretionary funding which this council receives. The Prince William Sound council has received a total of 15.1 million dollars in discretionary funds during the period 1990 through 1996. The Prince William Sound council has used these discretionary funds primarily to employ staff and expert consultants, who in turn have played a key role in all of the major research projects undertaken by the council. In some instances, the work of the Prince William Sound council in joint projects has also been aided by financial contributions to those projects by other organizations, totaling approximately 1.87 million dollars in the period 1990-1996. Furthermore, the Prince William Sound council has benefited from the work of a network of volunteer advisors, and the members of this council report committing more time to the advisory process (on average) than the members of any of the other councils in this study.

The Cook Inlet council has less access to technical and organizational resources than the Prince William Sound council. The Cook Inlet council has received 3.47 million dollars in discretionary funds during the period 1990 through 1996, which is only 23% of the discretionary funding received by the Prince William Sound council in the same period. The work of the Cook Inlet council in joint projects has also been aided by financial contributions to those projects by other organizations, totaling approximately 183,000 dollars in the period 1990-1996. This is approximately one-tenth the amount of the financial contributions made by other organizations to joint projects in which the Prince William Sound council was involved in that same period.

The differences in funding levels between the two Alaskan councils are reflected in the number of staff which the two councils employ. In every year since its inception, the Prince William Sound council has employed at least twice as many staff members as the Cook Inlet council. Furthermore, in every year since its inception, the Prince William Sound council has benefited from the work of at least twice as many volunteer advisors as the Cook Inlet council. Finally, the members of the Prince William Sound council report an average time commitment to the advisory process which is approximately three times greater than the time commitment reported by the members of the Cook Inlet council.

The Maine and California councils have few technical and organizational resources to draw upon by comparison to the Alaskan councils. The Maine and California councils do not have access to discretionary funds, nor have they requested funds for specific projects from other organizations. The members of the Maine and California councils receive no more than three months of full-time support from one state agency staff member each year, and they do not make regular use of volunteer advisors. The members of these two councils report committing (on average) one-half as much time to the advisory process as the members of the Cook Inlet council, and approximately one-seventh as much time as the members of the Prince William Sound council. In essence, the ability of the Maine and California councils to study policy issues is limited to the efforts of the council members themselves, while the members of the Alaskan councils are able to reinforce their own efforts by delegating tasks to staff, consultants, and volunteers.

The four councils in this study can be placed into three resource categories which are based on several measures of council resources: levels of funding, number of staff, number of volunteer advisors, and average time commitment by council members to the work of the council. The Prince William Sound council can be placed in the *high resources* category because it has the highest score of any of the councils on each of the four resource measures named above. The

Cook Inlet council can be placed in the *moderate resources* category because it has a modest score on each of the four resource measures. The Maine and California councils can both be placed in the *low resources* category because they have a score of zero on two of the resource measures (discretionary funding and number of volunteer advisors), and very low scores on the other two measures (number of staff and time commitment of council members).

The effect of council resource rank on knowledge production by the councils can be analyzed by using a count of the environmental research projects sponsored by the councils as a measure of their ability to generate new knowledge in the policy process. The Prince William Sound council (in the high resources rank) sponsored 55 research projects on the environmental management of the marine oil trade in the years 1990 through 1996. By comparison, the Cook Inlet council (in the moderate resources rank) sponsored 19 research projects on the environmental management of the marine oil trade in the same period. The Maine and California councils (in the low resources rank) have not sponsored any major research projects. Therefore, the data indicates a direct relationship between council resource rank and the ability of the councils to generate new knowledge in the policy process.

Do council resources also enhance the ability of the councils to contribute to policy change? This study identified eight cases where the councils in this study have proposed major policy changes. The California councils is excluded from this analysis because it has not proposed any major policy changes. In five of the cases, the proposals of the councils were implemented. In the remaining three cases, the proposals of the councils were not fully implemented. A comparison of resource rank with the success of the councils in securing the implementation of their policy proposals does not provide evidence for a direct relationship between these variables. The patterns of council success and failure in securing policy change do not match the variations in council resource rank. Therefore, variations in council resources alone do not fully explain the variations in the ability of the councils to secure the implementation of their policy proposals.

The variable of political context provides a more complete explanation of variations in the ability of the councils to secure policy change. *Political context* is defined by the level of support which the policy proposals of the councils receive from key stakeholder groups (those groups holding authority or influence in the policy areas of interest to the councils). Political context was measured in each of the eight cases where the councils proposed a major policy change. Because the political context was found to have shifted over time in three of these cases, this examination of political context was divided into two stages. The first stage was the *initial* political context which the councils encountered when they first made their proposals for policy change. The second stage was the *ultimate* political context (the policy positions of key stakeholder groups in the present day). Political context (in both the initial and ultimate stages) was correlated with policy change in all eight cases. The policy proposals of the councils were implemented in each case where they encountered active political support from one or more key stakeholder groups. These proposals were not implemented in any case where they only encountered low support or active opposition from key stakeholder groups.

Dispute resolution methods were used in only one of the eight cases where the councils sought policy change. An examination of this one case reveals that these methods played a significant role in enabling the council to secure the implementation of its policy proposal. However, an examination of the patterns of policy change does not show an association between the use of dispute resolution methods and policy change in the other seven cases.

In sum, this study identifies a number of cases in which the councils have mac contributions to the policy process. The councils have done this both by contributin production of new knowledge and by contributing to the implementation of new env safeguards. This study identifies three central factors influencing the capacity of the councils to contribute to the policy process. First, technical and organizational resou pivotal role in allowing the councils to generate new knowledge in the policy process. In particular, discretionary funding is vital in allowing the councils to employ staff and expert consultants to conduct research projects. Research projects, in turn, play a central role in allowing the councils to produce new knowledge in a policy area involving complex questions of science and technology. In some cases, research projects also enhance the ability of the councils to contribute to the implementation of new environmental safeguards. Second, political context plays a decisive role in affecting the ability of the councils to contribute to policy change. The level of support which key stakeholder groups give to the policy proposals of the councils heavily affects the chances that those proposals will be implemented. Finally, in one case in this study, the use of dispute resolution methods by a council helps it to secure policy change despite initial resistance from key stakeholder groups.

7.2. Policy Implications

Three major policy implications can be drawn from the findings of this study. First, this study demonstrates that citizen advisory councils can be a highly effective method for the meaningful involvement of citizens in a policy area involving complex questions of science and technology. This study also demonstrates that citizen advisory councils can make important contributions to the production of new knowledge in the policy process and the implementation of new environmental safeguards. These findings imply that advisory councils have a strong potential to enhance policy dialogues through citizen participation.

Second, many of the achievements of the councils in this study are rooted in their ability to conduct research projects using staff and expert consultants. Research projects play a central role in allowing advisory councils to contribute to policy areas involving technical questions. This finding implies that citizen advisory councils will be most effective in contributing to technically intensive policy areas when they have access to the resources necessary to conduct research.

Third, one case examined in this study illustrates the importance of dispute resolution methods in allowing a council to overcome disagreements with other stakeholder groups. This case implies that collaborative approaches to analysis are more effective than adversarial approaches to analysis in resolving technically intensive disputes between an advisory council and other stakeholder groups. Adversarial analysis tends to feed mutual suspicions of manipulated analysis among contesting stakeholder groups, which in turn can cause policy debates to deadlock. A collaborative approach to analysis offers a constructive alternative to the dilemma posed by adversarial analysis. By studying disputed policy issues through a jointly managed research project, the council and other stakeholder groups involved in a policy debate can improve their chances of avoiding mutual suspicions of manipulated analysis. Collaborative analysis can therefore allow these groups to build a mutually acceptable foundation of knowledge which can then be used as the basis of consensus decisions.

7.3. Proposals for Further Research

Future research might consider the capacity of advisory councils to contribute to the policy process in different policy contexts. The councils in this study are embedded in a policy context which generally favors their efforts to improve the environmental performance of the marine oil trade. Because marine oil spills have a high public profile, such spills carry severe legal and political consequences for the responsible corporation. Second, the councils in this study have been able to work with a relatively small number of corporate entities with access to substantial resources that can be invested in new environmental safeguards. It can be argued that these contextual characteristics, when taken together, tend to make the oil corporations in this study relatively responsive to calls for new environmental safeguards by the councils. The ability of advisory councils to contribute to the policy process might be more constrained in policy contexts with less favorable characteristics, such as coordination problems due to the involvement of a large number of corporate entities, or a lack of resources available for investments in new environmental safeguards within the industry in question, or relatively minor legal and political repercussions for environmental damage caused by the industry in question. Future research might compare the performance of advisory councils in differing policy contexts, including contexts which are less favorable than the context found in this study. Future research might also compare the costs of citizen advisory councils to the environmental benefits generated by the work of the councils.

APPENDIX A. LIST OF INTERVIEWS

Prince William Sound Regional Citizens Advisory Council (RCAC)

President of the Prince William Sound RCAC (August 1996 and April 1997).

Vice-President of the Prince William Sound RCAC (April 1997).

Former President of the Prince William Sound RCAC (September 1996).

Executive Director of the Prince William Sound RCAC (August 1996).

Staff member of the Prince William Sound RCAC involved in the marine fire protection project and community outreach activities (September 1996).

Staff member of the Prince William Sound RCAC involved in tanker escort projects (September 1996).

Staff member of the Prince William Sound RCAC involved in tanker escort and weather reporting projects (September 1996 and October 1996).

Staff member of the Prince William Sound RCAC involved in oil spill response projects (September 1996).

Staff member of the Prince William Sound RCAC involved in the debate over vapor emission controls at the Valdez oil terminal (October 1996)

Staff member of the Prince William Sound RCAC involved in public communications (September 1996).

Research team member, Prince William Sound Risk Assessment (October 1996).

Director of Alaskan Maritime Affairs at ARCO Marine (September 1996, April 1997, and October 1997)

Port Operations Coordinator for SeaRiver Maritime (September 1996 and April 1997).

Manager of Marine Affairs for British Petroleum in Alaska (September 1996 and April 1997).

Alyeska Pipeline Service Company Terminal Advisor (October 1997).

Former Tanker Vapor Control Manager for the Alyeska Pipeline Service Company (October 1997).

Project Manager of the Valdez Air Health Studies for the Alyeska Pipeline Service Company (October 1997).

Vice-President of the Ship Escort Response and Vessel Service, Alyeska Pipeline Service Company (September 1996).

Public Relations Manager for the Alyeska Pipeline Service Company (September 1996).

Contingency planning manager for Prince William Sound, Alaska Department of Environmental Conservation (September 1996, April 1997, and October 1997).

Manager of contingency planning and emergency response, Alaska Department of Environmental Conservation (October 1997).

Air quality specialist, Alaska Department of Environmental Conservation (October 1997).

Environmental specialist, Alaska Department of Environmental Conservation (October 1997).

Manager of marine vessels section, Alaska Department of Environmental Conservation (September 1996).

Commanding Officer, U.S. Coast Guard Marine Safety Office in Valdez, Alaska (April 1997 and October 1997).

Former Commanding Officer, U.S. Coast Guard Marine Safety Office in Valdez, Alaska (April 1997 and October 1997).

Executive Officer, U.S. Coast Guard Marine Safety Office in Valdez, Alaska (September 1996).

Liaison to the Joint Pipeline Office, U.S. Environmental Protection Agency, Anchorage, Alaska (August 1996).

Environmental engineer, U.S. Environmental Protection Agency, Durham, North Carolina (October 1997).

Manager of the Alyeska Pipeline Service Company Terminal Fire Brigade (October 1997).

Chief of the Valdez Fire Department (October 1997).

First Project Manager of the Prince William Sound Risk Assessment (April 1997).

Second Project Manager of the Prince William Sound Risk Assessment (April 1997).

Cook Inlet Regional Citizens Advisory Council (RCAC)

Former President of the Cook Inlet RCAC (September 1996).

Former Vice-President of the Cook Inlet RCAC (September 1996).

Treasurer of the Cook Inlet RCAC (September 1996).

Member of the Cook Inlet RCAC representing the fishing industry (September 1996).

Executive Director of the Cook Inlet RCAC (September 1996, April 1997, and October 1997).

Former Executive Director of the Cook Inlet RCAC (September 1996).

Staff member of the Cook Inlet RCAC involved in contingency plan review (September 1996).

Staff member of the Cook Inlet RCAC (September 1996).

Commanding Officer, U.S. Coast Guard Marine Safety Office in Anchorage, Alaska (September 1996 and October 1997).

Supervisor, U.S. Coast Guard Marine Safety Detachment in Kenai, Alaska (September 1996).

Oil spill response specialist, National Oceanic and Atmospheric Administration, Anchorage, Alaska (September 1996).

General Manager of Cook Inlet Spill Prevention and Response Incorporated (September 1996).

Contingency planning manager for the Tesoro Alaska Petroleum Company (October 1997).

Former contingency planning manager for the Tesoro Alaska Petroleum Company (September 1996).

Manager of Alaska Environmental Affairs for the Tesoro Alaska Petroleum Company (September 1996).

Environmental scientist at the UNOCAL corporation (September 1996).

Environmental supervisor at the UNOCAL corporation (October 1997).

Contingency planning manager for the Cook Inlet region, Alaska Department of Environmental Conservation (September 1996 and October 1997).

Contingency planning specialist, Alaska Department of Environmental Conservation (October 1997).

Maine Oil Spill Advisory Committee (OSAC)

Chair of OSAC representing the Maine Aquaculture Association (November 1996).

Member of OSAC representing the Maine Sardine Council (November 1996 and October 1997).

Member of OSAC representing the lobster fishing industry in Maine (November 1996).

Member of OSAC representing the Maine Petroleum Association (November 1996).

Member of OSAC representing the oil spill response corporation Clean Cascoe Bay, Incorporated (November 1996).

Member of OSAC representing the general public (November 1996).

Director, Division of Response Services, Maine Department of Environmental Protection (November 1996).

Staff member, Division of Response Services, Maine Department of Environmental Protection (November 1996).

Chief, Response and Planning Department, U.S. Coast Guard Marine Safety Office in Portland, Maine (November 1996).

Staff member of the Maine Congressional Delegation (October 1997).

California Oil Spill Technical Advisory Committee (TAC)

Chair of TAC representing a redevelopment agency in San Francisco (October 1996).

Vice-chair of TAC representing the general public (October 1996).

Member of TAC representing the Natural Resources Defense Council (October 1996).

Member of TAC representing the Chevron corporation (October 1996).

Member of TAC representing the Marine Spill Response Corporation (October 1996).

Director, Office of Oil Spill Prevention and Response, California Department of Fish and Game (October 1996).

Staff member, Office of Oil Spill Prevention and Response, California Department of Fish and Game (October 1996).

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