Collaborative Environmental Institutions: All Talk and No Action?

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Abstract

Many analysts view collaborative institutions that attempt to forge consensus and build cooperation among conflicting stakeholders as a potential remedy to the pathologies of conventional environmental policy. However, few analyses have demonstrated that collaborative institutions actually increase levels of cooperation, and critics accuse collaborative institutions of all talk and no action. This paper reports the use a quasi-experimental design to compare the levels of consensus and cooperation in coastal watersheds with and without U.S. EPA's National Estuary Programs, one of the most prominent national examples of collaborative institutions in the environmental policy domain. Panel survey data from more than 800 respondents shows that while the level of consensus is higher in NEP estuaries, there is no difference between NEP and non-NEP estuaries in the level of cooperation. © 2004 by the Association for Public Policy Analysis and Management.

INTRODUCTION

Beginning in the early 1980s with the emergence of negotiated rulemaking (Coglianese, 1997; Langbein and Kerwin, 2000) and ecosystem management (Yaffee et al., 1996), environmental policy has witnessed a flood of policy innovations that can be broadly defined as collaborative institutions. The hallmark of collaborative institutions is an attempt to encourage consensus and cooperation among the multiple actors with some political, economic, or administrative stake in policy outcomes. Collaborative institutions emerged from dissatisfaction with the adversarial, command-and-control style of governance embodied by conventional environmental policies, which have left many environmental problems unresolved while at the same time inflaming large amounts of costly legal and administrative conflict (Fiorino, 1999; Kagan, 1999). Collaborative institutions of some type are now operating in almost every federal agency and many state agencies involved with environmental policy, as well as agencies dealing with other policy issues (Bardach, 1998).

Yet, there is still hot debate about the ability of collaborative institutions to actually build consensus, encourage cooperative behavior, and improve environmental outcomes (Kenney, 2000a). Some studies hail collaborative institutions as the answer to many of the pathologies of adversarial policy (John, 1994; Marsh and Lallas, 1995;

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Weber, 1998). Others argue that collaborative institutions are at best a passing administrative fad, and at worst guilty of all talk and no action; i.e., the collaborative process leads to favorable changes in attitudes and social relationships, without the subsequent behavioral changes in levels of cooperation that are necessary to improve environmental outcomes (Kenney, 2000a,b). If process is the product, then collaborative institutions may actually do more harm than good by creating perceptions of progress in the absence of any real change, thereby reducing the expressed political demand for policy change without addressing the environmental and social conditions that generated the demand.

For example, researchers of one prominent species of collaborative institutions, negotiated rulemaking, find that participants in negotiated rulemaking at the U.S. Environmental Protection Agency (EPA) report higher levels of satisfaction with process and outcomes than participants of conventional rulemaking (Langbein and Kerwin, 2000). Coglianese (1997), on the other hand, finds that negotiated rulemaking at EPA reduces delays only modestly, if at all, and may even be subject to more litigation than conventional rulemaking. At least on the basis of this limited evidence, negotiated rulemaking appears at risk of a disjuncture between promise and performance—a disjuncture that may generalize to other species of collaborative institutions as well.

This paper examines the debate by outlining two theoretical perspectives, one that corresponds to the proponents of collaborative institutions, while the other comports with the critics. The optimistic theoretical perspective is the political contracting framework of neo-institutional economics (Eggertsson, 1990, Libecap, 1989; Lubell et al., 2002; Ostrom, 1990, 1999), which views collaborative institutions as a specific type of political decisionmaking process in which stakeholders attempt to agree upon mutually advantageous policies. The development of policy agreements is often hindered by transaction costs, which can be categorized into the information, negotiation, and enforcement phases of contract development (Heckathorn and Maser, 1987). In comparison to adversarial institutions, the main advantage of collaborative institutions is their ability to reduce the transaction costs of political contracting for certain types of environmental conflicts.

Murray Edelman's (1960, 1964, 1971) concept of symbolic policy provides the pessimistic view of collaborative institutions. Symbolic policies occur when government programs fail to produce tangible changes in behavior and resource allocations, and instead consist of symbols connoting the suppression of some threat to the supporters of the policy. Under certain necessary conditions, symbolic policies lead to the disjuncture between promise and performance that critics often attribute to collaborative institutions.

Another species of collaborative institutions, watershed partnerships, offers an empirical setting to explore these theoretical perspectives. Kenney et al. (1999, p. 2) define watershed partnerships as:

> A primarily self-directed and locally-focused collection of parties, usually featuring both private and intergovernmental representatives, organized to jointly address water-related issues at the watershed level or a similarly relevant physical scale, normally operating outside of traditional governmental processes or forums, and typically reliant on collaborative mechanisms of group interaction characterized by open debate, creativity in problem and solution definition, consensus decisionmaking, and voluntary action.

More specifically, survey data are examined from a panel survey of more than 800 stakeholders from 12 estuaries with and 10 without the USEPA's National Estuary

Program (NEP), which is one of the most prominent national examples of a watershed partnership.

WATERSHED CONFLICTS, TRANSACTION COSTS, AND SYMBOLS

The political contracting framework identifies the types of conditions under which collaborative institutions should be effective at producing consensus and cooperation. Similarly, symbolic policy identifies the conditions under which there should be a divergence between words and deeds. A strong argument can be made that watershed conflicts meet the criteria for both theories. Fortunately, it is possible to empirically distinguish which theory is more plausible because they offer competing hypotheses about whether or not the NEP will actually produce an increase in cooperative behavior, and not just an increase in the level of consensus.

Watershed Conflicts and Transaction Costs

According to the political contracting perspective, the transaction costs of developing policy agreements are lower when there is a good match between the structure of political institutions and the structure of the policy issue at hand. Two types of institutions constitute the relevant comparison in this analysis, the new collaborative institutions and the adversarial (called command-and-control by others) institutions that have been the traditional form of environmental policy since the 1970s. Collaborative institutions like the NEP structure the political contracting process in a particular way: they feature inclusive stakeholder participation; produce policies specialized for a particular situation; and rely on voluntary compliance. In contrast, adversarial institutions limit the scope of participation, produce standardized rules, and rely on coercive penalties for implementation (John, 1994; Lubell, 2002; Lubell et al., 2002; Marsh and Lallas, 1995; Weber, 1998).

Some details about the NEP, which was established under Section 320 of the 1987 Clean Water Act Amendments, may clarify the nature of collaborative institutions. States nominate estuaries for inclusion into the NEP, and those estuaries that meet EPA criteria are authorized to form a Management Conference consisting of private and public stakeholders from all levels of the federal system with an interest in a particular estuary. The Management Conference is a 3- to 5-year planning process that attempts to forge consensus about the causes and consequences of estuary problems, the policy actions needed to address those problems, and in many cases the public and private stakeholders who are expected to implement the policies. Decisionmaking within the Management Conference, which is divided into committees, generally proceeds along some agreed-upon rules of collective choice ranging from strict consensus to some type of majority rule. The product of the Management Conference is a Comprehensive Conservation Management Plan (CCMP) that outlines action items for addressing estuary problems. Implementation of specific aspects of the CCMP is voluntary and normally left to specific public and private organizations, often using existing programs.

Implementation of the CCMP is generally coordinated with existing regulatory programs, such as National Pollution Discharge Elimination System permits for point sources. Indeed, administrative officials are often asked to voluntarily change the regulatory process in pursuit of the broader goals of the NEP. Hence, the NEP should not be considered a replacement or substitute to existing regulatory programs, but rather a complement that may increase regulatory compliance and interagency cooperation, while at the same time encouraging a variety of non-regulatory solutions.

Some case studies of collaboration from specific NEP estuaries are instructive.[1] In the Long Island Sound Study, several agencies and interest groups signed a memorandum of understanding in 2000 agreeing to restore 2000 acres of coastal and 100 miles of riparian habitat by 2008; a 2001 progress report shows 338 acres of coastal habitat and 29 miles of river restored. Accomplishing this task required funneling a variety of financial and administrative resources towards the management goal of protecting living marine resources. Long Island Sound Study also initiated a bi-state agreement between New York and Connecticut to reduce by 58 percent the amount of nitrogen entering Long Island Sound from point sources, a plan that was eventually integrated into total maximum daily load recommendations. The Peconic Estuary Program has coordinated several research and monitoring projects to better understand the biology of the microorganism that causes brown tide, the sources of which were largely a mystery at the time the estuary entered the program. The Tampa Bay National Estuary Program facilitated the creation of the Nitrogen Management Consortium, a formal partnership between Tampa Bay local governments and regulatory authorities to reduce nitrogen inputs into the bay with a variety point and non-point source management projects. These activities are only examples; there is certainly not enough space in this article to document the full range of activities in each NEP (for more examples, see EPA's *Coastlines* publication at <http://www.epa.gov/owow/estuaries/coastlines/>). Of course, the major question is whether the NEP is more effective at building these types of collaborative activities than existing policies in non-NEP estuaries.

Proponents argue that one reason the level of activities in the NEP may be higher is that the collaborative structure of the NEP is better suited to complex watershed problems, which span administrative and political boundaries, affect multiple environmental media (e.g., air, land, water), and have complex cause-and-effect relationships with often delayed or invisible environmental responses (John, 1994; Marsh and Lallas, 1995; Woolley and McGinnis, 1999). The inclusive style of the NEP addresses boundary-spanning problems by reaching out to stakeholders previously confined to isolated subsystems, providing them the opportunity to interact, share information, pool resources, and integrate otherwise redundant or fragmented policies (Rabe, 1986). Specialized institutions recognize the site-specific nature of estuary problems and thus take into account marginal differences among resource users in terms of environmental protection costs and effects on estuary health. Because there are no legal requirements for participation or implementation, the NEP implementation game depends on voluntary cooperation on the part of both government agencies and private interests. In theory, cooperation relies on self-enforcing norms of reciprocity and trust, which should reduce the monitoring and enforcement costs normally associated with environmental compliance (Axelrod, 1984). The voluntary nature of the program also allows policymakers to encourage sustainable behavior among actors who are outside the jurisdiction of existing regulations, such as homeowners or

[1] In preparation for wave 1 of the NEP survey, I conducted extensive interviews of NEP participants in the Long Island Sound and Peconic Bay National Estuary Programs. I also conducted many less formal interviews in the context of building the survey sample for non-NEP estuaries, especially in Florida. There is also extensive documentation of NEP projects available at the websites of individual projects, by request from NEP officials, or in various EPA reports to Congress.

landowners who cannot be forced by any existing adversarial policy to implement environmentally sustainable practices on private property.

If the political contracting framework is correct, NEP stakeholders should not only perceive greater levels of consensus on a range of policy issues, but should also engage in more cooperative behavior.

Watershed Conflicts and Symbolic Policy

Edelman argues there are three necessary conditions for symbolic policy. First, there must be a threat to the welfare of some group. In the case of watersheds, the threat comes from the continuing water quality and habitat destruction. The group being threatened is the broad community with some economic or political stake in the condition of natural resources; this community may include both government and non-government actors. As Edelman (1971) argues, the mobilization of both mass and elite political opinion stem from their engagement with common symbols.

Second, the threatened group is not well organized enough to protest symbolic policies that fail to deliver. Because environmental policies often feature diffuse benefits and concentrated costs, environmental interest groups are more difficult to organize than concentrated business groups (Wilson, 1980). Obviously, the emergence of national environmental interest groups in the 1970s has challenged the generalizability of this argument. But even the national environmental movement appears to follow an issue-attention cycle: a gradual decline since 1970 in the overall level of environmental concern and activism, which has settled at a level of environmental concern higher than before the environmental movement and is more sensitive to environmental crises, but is rarely on the top of the national agenda (Downs, 1972; Dunlap and Mertig, 1990). Similarly, while a large proportion of citizens express environmental values in public opinion surveys, a much smaller proportion actually engages in environmental behaviors (Lubell, 2002).

One important objection to this argument in the context of watershed conflicts is the development of local environmental groups focused on specific local problems, for example, Save the Sound in the Long Island Sound watershed in New York and Connecticut, or Tampa BayWatch in Tampa Bay, Florida. Many watershed partnerships have some type of local group associated with them, and there is often intense interaction between these groups and government officials. However, nobody has demonstrated the ability of these groups to influence policy implementation and resource allocation—they may be limited to a small set of elite activists in a community, or even contribute to symbolic policy by creating the impression that somebody is "doing something" about local problems, therefore absolving the broader community of responsibility.

Third, social psychology suggests that people are more likely to appropriate symbols in uncertain and emotion-laden situations. Psychologically, Edelman argues, people often rely on simplification and stereotypes in uncertain situations, where they are forced to evaluate situations in terms of preconceived beliefs rather than integrate new information. This argument is supported by theories of attitude change in social psychology, which argue that people often form attitudes on the basis of heuristics and external cues when faced with cognitively challenging decisions. For example, Petty and Cacioppo's (1986) "elaboration likelihood" theory argues that complex situations increase the probability of "peripheral" information processing, where people are more likely to rely on external cues to form judgments.[2] In uncertain and threatening situations, public policy can serve as a symbol that the threat is being alleviated.

Certainly, many watershed conflicts are complex and emotion-laden. For any given watershed conflict—for example, the rapid decline of many subspecies of steelhead and salmon in the Northwest—there is often a complex mixture of natural and artificial causes (e.g., dams, warming ocean temperatures, agricultural runoff, clear-cutting, irrigation), where the links between cause and effect are often invisible, non-linear, and spread over time and space. At the same time, the loss of local natural resources stokes human passions by threatening the physical health and economic welfare of local communities. In many regions, the threatened natural resources are powerful cultural symbols—salmon and temperate rainforests in the Pacific Northwest, groundfish in the Northeast Atlantic, bayous in Louisiana, etc. In short, stakeholders in watershed conflicts may easily accept symbolic policies that appear to address a particular problem, even while the underlying threat continues.

If collaborative institutions produce symbolic policy, then there should be a higher level of consensus about watershed issues among NEP stakeholders, in comparison to stakeholders from watersheds without the NEP. In terms of attitude change, the symbolic policy and political contracting frameworks make the exact same prediction. However, if symbolic policy is correct, then consensus should not be followed by cooperative behavior. Consensus is enough to symbolize progress and purchase political quiescence, and people are not willing to incur the transaction costs of actually changing ingrained patterns of behavior. Hence, the testable hypothesis for symbolic policy is that while NEP estuaries have higher levels of consensus than non-NEP estuaries, there should be no difference in levels of cooperation, or even more strongly, levels of cooperation will be lower in NEP estuaries.

Incorporating Stakeholders' Belief Systems

To isolate the effect of the NEP on consensus and cooperation, my analysis will control for elements of stakeholders' belief-systems that may influence their perceptions of consensus and the decision to cooperate. Sabatier and Jenkins-Smith's (1993, 1999) Advocacy Coalition Framework (ACF) argues that policy decision-making is structured by belief systems consisting of policy core beliefs that define normative preferences about policymaking, and secondary beliefs about specific aspects of a policy arena.

"Collective-action beliefs" are secondary beliefs about the attributes of the estuary action arena that reflect the benefits and transaction costs of collective action. Collective-action beliefs are essentially the subjective representation of those features of a particular situation that would affect the transaction costs of political contracting if those transaction costs could be objectively measured. I argue that people learn to rely on these beliefs as heuristics for evaluating options and making decisions in collective-action situations (see Lubell [2003] for an extended theoret-

[2] Motivation is an important mediator of peripheral processing. Emotional situations like watershed conflicts may increase the motivation of people to engage in "rational" as opposed to biased information processing. For example, Marcus, Neuman, and MacKuen (1990) argue that citizens are more likely to rely on their knowledge of a policy issue to form judgments about a political candidate when their level of anxiety about that issue is high. However, it is unclear how motivation might affect the propensity of people to latch on to symbols, because Marcus, Neuman, and MacKuen (1990) also argue people are more open to persuasion in emotional situations, because they are less wed to pre-existing beliefs.

ical argument and test). Following Ostrom (1999) and Ostrom, Gardner, and Walker (1994), I group collective-action beliefs into beliefs about attributes of watershed problems, the institutional process, and other actors.

According to North (1990), uncertainty about the attributes of resources being exchanged is the primary source of transaction costs. Hence, features of watershed conflicts that increase or decrease uncertainty influence the likelihood of cooperation. Stakeholders are less likely to cooperate when addressing broad problems that implicate a wide variety of actors, which makes it difficult to identify causal relationships and creates problems of hidden information and behavior (Schlager, Blomquist, and Tang, 1994). Conversely, adequate scientific knowledge about the problem increases cooperation by reducing uncertainty.

Ostrom (1990) identifies several characteristics of governance institutions that increase their chances of successfully managing common-pool resources. Institutions that reduce the likelihood of expanding conflict from the local setting to broader political or administrative arenas are more likely to produce cooperation. Similarly, stakeholders are more likely to cooperate when they believe the process is fair in terms of representing their particular interests and avoids domination by other interests. Perceived increases in agency commitment or budget resources will also reduce transaction costs, therefore increasing cooperation. With regard to beliefs about other actors, if stakeholders trust others to fulfill promises made in the context of political contracting, they are more likely to cooperate. The role of trust in reducing transaction costs is well established by the social capital literature (Coleman, 1990; Putnam, 1993).

Second, I control for three important policy-core beliefs:

- Environmentalism: Preference for environmental protection over economic development and a general belief in the value of biodiversity.
- Conservatism: Preference for private property rights and a belief that the market is superior to government for determining allocation of natural resources.
- Inclusiveness: Preference for maximum public participation in policy-decisions.

When people are forming specific evaluative beliefs (e.g., consensus) about some attitude object and then making behavioral decisions (e.g., cooperation) on the basis of those beliefs, policy-core beliefs act as cognitive filters that overweight information consistent with prior expectations and discount inconsistent information. I expect environmentalism and inclusiveness to be positively related to consensus and cooperation, and conservatism to be negatively related. This follows the traditional expectations regarding conflict between economic and environmental interests (Sabatier and Jenkins-Smith, 1993; Lubell [2003] offers a more complex set of hypotheses).

There are two strategies for estimating the effect of the NEP on consensus and cooperation, while taking into account the structure of belief-systems. One strategy is to assume that the NEP has a direct effect on consensus and cooperation, while controlling for collective-action beliefs and policy-core beliefs. The direct-effects strategy suggests entering all variables simultaneously into a linear regression model. However, the NEP and policy-core beliefs may also affect collective-action beliefs. For example, political contracting theory predicts collaborative institutions should build trust and be perceived as more fair. The ACF argues policy-core beliefs affect information processing about characteristics of the estuary action arena, and thus constrain the formation of collective-action beliefs. If one assumes the NEP affects collective-action beliefs, and collective-action beliefs affect consensus and cooperation, then the NEP will have an indirect effect on consensus and cooperation. The indirect strategy suggests developing a system of equations that simultaneously estimates the direct effects of the NEP on consensus and cooperation, and also the indirect effects of the NEP on the relevant collective-action beliefs. Thus, the gross effect of the NEP represents a combination of the direct effect on consensus/cooperation, and the indirect effect through collective-action beliefs. The indirect modeling strategy can also identify the collective-action belief through which the NEP has the strongest indirect influence. Both strategies were used in the following analyses.

RESEARCH DESIGN AND ANALYSIS

The quasi-experimental research design consists of a panel telephone survey of a sample of 1515 stakeholders from 12 estuaries with the NEP and 10 estuaries without the NEP.[3] The first wave of the panel was conducted from March to July 1999; the second, from March to June 2001. The total response rate in wave 1 was 64 percent for NEP estuaries and 65 percent for non-NEP estuaries. For wave 2, in which respondents were re-contacted, the response rates were 77 percent for NEP estuaries and 81 percent for non-NEP estuaries. A total of 840 respondents completed both waves of the panel.

Because many policy actors switch jobs or relocate within a 2-year time span, ineligible respondents constituted the majority of wave 2 dropouts.[4] I also interviewed replacements if they were available. Measurements of the independent variables for replacements are all from wave 2; a dummy variable in the regression indicates replacements.[5]

[3] The NEP sample frame was constructed by combining lists of stakeholders that were constructed by individual NEP coordinators and EPA's Office of Wetlands, Oceans, and Watersheds. I randomly selected a maximum of 100 respondents from each list; all stakeholders were included from lists with fewer than 100 names. The non-NEP estuaries did not have similar lists of stakeholders, and hence required a different strategy. I first contacted the federal and state government agencies and interest groups in the estuaries to develop a list of 10 to 20 "seed" interviews. I then contacted stakeholders on this list by telephone and in addition to generating substantive information about policies in each estuary, the interviews were designed to generate the names of three or fewer additional stakeholders, who we interviewed in a second round. This snowball process continued until no new names were generated or the target of 30 interviews in each estuary area was completed.

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[5] Even if wave 1 respondents had moved to another job between panels, they were considered eligible respondents if they reported being active on estuary issues in the past 12 months. If the wave 1 respondent had changed jobs and was no longer active on estuary issues, I attempted to interview their replacement. If there was no replacement, the case was dropped from the study as an ineligible respondent for wave 2. The purpose of this criterion was to maintain as much consistency across individuals as possible.

In this case, the main advantage of the panel analysis is that levels of cooperation and consensus are measured in wave 2, while the majority of the survey-related independent variables are measured at wave 1. Thus, there is less chance of reciprocal causation between the dependent and independent variables, which is often a threat to inference in single cross-section research designs where respondents simultaneously answer a variety of related questions.[6] The panel design does not examine changes in the dependent variables, which is traditionally accomplished by including lagged values of the dependent variable as an explanatory variable in the regression equations.

Variable Construction

The analysis focuses on two central dependent variables, consensus and cooperation. Both of these variables are measured during wave 2 of the panel survey. The measure of consensus is based on perceptions of agreement, while the measure of cooperation is based on a range of reported collaborative behaviors. If the political contracting perspective is correct, then NEP stakeholders should exhibit higher levels of both consensus and cooperation in comparison to non-NEP stakeholders. If symbolic policy is correct, then NEP stakeholders should have higher levels of consensus, but not cooperation—people feel good, but act no differently.

The consensus scale averages responses to six disagree-agree questions ranging from [0 = disagree, 10 = agree], which measure perceived agreement on the following dimensions: causes of estuary problems, severity of estuary problems, required research, best policy tools, economic consequences of policy, and environmental consequences of policy (Cronbach's $\alpha = 0.86$). The underlying assumption is that consensus occurs when everybody "agrees to agree." The symbolic policy perspective implies consensus is perceived as an improvement over the disagreement customarily observed in adversarial institutions, and that consensus is a necessary precursor to taking actions that will improve environmental conditions. Agreement that environmental problems are improving is possible but not necessary for symbolic policy; even a consensus that environmental problems (e.g., levels of pollution) are worsening may create an opportunity for symbolic policy solutions. If political contracting is correct, perceptions of worsening problems should be followed by more cooperation. But if symbolic policy is correct, consensus on possible solutions to a severe problem may be sufficient to create political quiescence.

The cooperation scale counts the number of "yes" answers to questions about whether or not in the last two years the respondent had collaborated with other stakeholders in seven possible activities: providing information to another organization, sharing personnel, joint research projects, joint funding proposal, interagency taskforce, memorandum of understanding, shared permitting or regulatory activities. These measures of cooperation attempt to operationalize the "smart practices" identified by Bardach (1998) as contributing to the "interagency collaborative

[6] It is very likely that reciprocal causation does occur; that is, favorable changes in collective-action beliefs leads to more cooperation/consensus, which in turn leads to favorable change in collective-action beliefs. This is part of the "virtuous circle" that occurs as cooperation emerges over time (Putnam, 1993). Finkel and Muller (1998) demonstrate the existence of the reciprocal influence between beliefs and behavior in the case of collective protest. Unfortunately, I do not have measures of consensus and cooperation from wave 1, and therefore cannot estimate the reciprocal relationship between consensus/cooperation in the manner of Finkel and Muller (1998). Estimating the reciprocal relationship remains a key priority for further research in this area.

capacity" of a policy community to solve joint problems, which in this case implies solving the environmental problems in an estuary. Following the convention of measurement theory, I designed the cooperation scale for maximum discrimination by including very cheap and informal modes of cooperation (e.g., information sharing) along with very costly and formal modes (e.g., memorandums of understanding). Accordingly, the frequency of cooperative behavior declines as the mode of cooperation becomes more formal.

The variables measuring collective-action beliefs are also from the survey, with all variables measured at wave 1 with 11-point Likert scales (see Appendix A for the wording of the questions). For each independent variable, I indicate the hypothesized direction of influence on consensus and cooperation: Stakeholder beliefs about characteristics of estuary problems are measured by perceptions of problem scope (–) in terms of the number of people who must change their behavior to improve environmental conditions, and the perceived adequacy of scientific knowledge (–). Questions about institutional processes measure beliefs about the necessity of conflict expansion (–) for solving estuary problems, the procedural fairness (+) of the collective-choice process (two-item scale; Cronbach's $\alpha = 0.76$), whether economic (–) interests dominate the collective-choice process, whether agency support (+) has increased in the last 2 years, and whether there has been a budget increase (+) in the last 2 years.[7] Trust (+) is measured by asking respondents whether they trust other stakeholders to fulfill their commitments made in the context of the management plan.

I measure three policy-core beliefs: conservatism (–), environmentalism (+), and inclusiveness (+). Since the ACF theorizes policy-core beliefs should be relatively stable throughout time in comparison to collective-action beliefs, I average the responses to the policy-core belief questions from wave 1 and wave 2 and examine both a direct and indirect strategy to estimate the effects of the policy-core beliefs.

Table 1 compares the mean values of all dependent and independent variables in NEP and non-NEP estuaries. To facilitate comparison, I linearly rescaled all values to range between [0,1]; this does not affect the range of variance within the scale. Even this baseline analysis shows some important differences. As the symbolic policy perspective predicts, the mean level of consensus is significantly higher in NEP estuaries, but the amount of cooperative behaviors is slightly lower. Collective-action beliefs are uniformly favorable for cooperation in the NEP, which foreshadows the upcoming conclusions that the effect of the NEP on consensus operates through changes in collective-action beliefs. Lastly, the only difference between NEP and non-NEP stakeholders in terms of policy-core beliefs is the level of conservatism. This reflects the idea that policy-core beliefs are more stable, but also that the inclusive nature of the NEP may reach out to traditionally regulated interests. The next set of analyses tests the robustness of these differences in means in a multivariate setting.

Regression Analysis

The baseline strategy estimates the direct effect of the NEP utilizing the following simple OLS regression, estimated separately for each dependent variable:

[7] Agency support and budget increase are measured in wave 2.

Table 1. Cooperation, consensus, and policy beliefs in NEP and non-NEP estuaries.

	NEP Estuaries	Non-NEP Estuaries
Dependent variables		
Consensus**	0.59 (0.016)	0.52 (0.009)
Cooperation^	0.64 (0.010)	0.67 (0.014)
Collective-action beliefs		
Scientific knowledge**	0.60 (0.009)	0.54 (0.013)
Problem scope**	0.69 (0.010)	0.61 (0.016)
Procedural fairness**	0.68 (0.008)	0.55 (0.014)
Economic interest domination**	0.44 (0.011)	0.63 (0.017)
Conflict expansion**	0.44 (0.012)	0.58 (0.019)
Budget increase**	0.69 (0.009)	0.59 (0.017)
Agency support**	0.65 (0.008)	0.57 (0.015)
Trust**	0.57 (0.008)	0.63 (0.013)
Policy-core beliefs		
Conservatism**	0.38 (0.007)	0.33 (0.011)
Environmentalism	0.70 (0.008)	0.73 (0.011)
Inclusiveness	0.77 (0.008)	0.80 (0.013)

Cells contain mean values in each type of estuary, with standard error in parentheses. T-tests of differences in means = 0, with unequal variances assumed: ^$p < 0.10$, *$p < 0.05$, **$p < 0.01$.

$$\text{Consensus/Cooperation}_{t} = \text{f(NEP dummy variable, collective-action beliefs}_{t\text{-}1}\text{, policy-core beliefs}_{\text{average: }t/t\text{-}1}\text{, replacement dummy variable)} \quad \text{(Eq. 1)}$$

In this model, the estimated slope coefficient for the NEP dummy variable captures the difference in levels of consensus/cooperation between NEP and non-NEP stakeholders. If the political contracting theory is correct, this slope coefficient should be significant and positive in the consensus and cooperation models. If symbolic policy is correct, the slope coefficient should be significant and positive in the consensus model, but not the cooperation model. Note the time subscripts, which indicate that collective-action beliefs are lagged independent variables and therefore minimize the possibility of reciprocal causation.

However, for theoretical reasons, the NEP and policy-core beliefs are expected to directly influence collective-action beliefs, and therefore to indirectly influence consensus and cooperation. Hence, I also estimate eight regression equations with each collective-action belief from equation 1 as a dependent variable, using policy-core beliefs, the NEP dummy, and the dummy indicator for wave 2 replacements as independent variables:

$$\text{Collective-action beliefs}_{t\text{-}1}\text{=f(NEP, policy-core beliefs}_{\text{average: }t/t\text{-}1}\text{, replacement dummy variable)} \quad \text{(Eq. 2)}$$

In essence, I am estimating a fully recursive system of equations that has no reciprocal causality. Fully recursive systems assume the error terms for each individual equation in the system of equations are uncorrelated with one another. Furthermore, I am assuming that collective-action beliefs in wave 1 do not have an effect on the NEP or policy-core beliefs (because policy-core beliefs are the superior elements of the belief-system hierarchy). As noted by Greene (2000) and Gujarati

(1995), fully recursive systems of equations are identified and can be estimated with OLS regression.[8]

Because all variables are linearly transformed to a [0,1] range, when the regression coefficients are multiplied by 100, they can be interpreted as the change in the expected value (expressed as an absolute percentage of the range of the dependent variable in the sample) of consensus and cooperation moving across the entire range of the explanatory variable. For example, if the expected value of consensus equals 0.10 when trust = 0 and the slope coefficient for trust equals 0.07, then ceteris paribus the expected value of consensus when trust = 1 will be 0.17 (0.10 + 0.07 = 0.17, or an absolute change of 7 percentage points).

Controlling for Non-Random Selection and Estuary Characteristics

As with all quasi-experimental designs, the non-random NEP designation process raises a causality question: Does the NEP increase levels of consensus and cooperation among estuary stakeholders, or do increases in consensus and cooperation precede the NEP designation? Because the NEP designation requires a state-level nomination and federal approval, there is reason to believe collaboration is occurring before the NEP designation. On the other hand, the effects of non-random selection might be small because wide-scale collaboration in estuaries does not develop until NEP activities begin, or because EPA's selection process responds to pork-barrel political considerations that have little to do with the ability of local stakeholders to overcome environmental collective action problems, like delivering tangible benefits to local interests.

If non-random selection were not an issue, the influence of the NEP could be estimated using straightforward OLS regression on equations 1 and 2 as discussed above. However, if cooperation, consensus, and collective-action beliefs were systematically different in estuaries before their selection into the NEP, the slope coefficient for the NEP dummy would systematically overestimate the influence of the NEP (Achen, 1986). To control for the potential selection bias, I estimate a treatment effects regression model using Heckman's two-step procedure as described by Greene (2000; see also Maddala, 1983), which models the NEP dummy variable as endogenous. The presence of the NEP is modeled as a probit selection equation, where the NEP is observed if some underlying latent variable representing the capacity for collective action (C_i) is greater than zero:

$$\begin{gathered} C_i^* = \gamma' \mathbf{w}_i + u_i \\ NEP_i = 1 \text{ if } C_i^* > 0, 0 \text{ otherwise} \end{gathered} \qquad \text{(Eq. 3)}$$

[8] Some might question the rather heroic assumption of uncorrelated errors between equations especially with survey data. Hence, I also estimated three-stage least square (3SLS) models using wave 2 measurements of collective-action beliefs in the structural equations for the consensus and cooperation models. Then, I used lagged values of the collective-action beliefs in the secondary equations to create instruments for the collective-action beliefs in the original model. The lagged values served as exclusion restrictions. However, this strategy also requires two possibly heroic assumptions: the lagged values of the independent variables have no effect on consensus and cooperation (which is particularly heroic given the findings reported in Table 1); and there is no reciprocal causation between consensus and cooperation and collective-action beliefs measured in wave 2. Fortunately, the 3SLS model leads to the same substantive conclusions about the effects of the NEP, namely the NEP indirectly affects consensus by changing collective-action beliefs, and does not affect cooperation at all. The 3SLS results are available from the author upon request.

When the error terms of the selection and outcome equations are correlated, there is a spurious relationship between the dependent variables and the NEP due to unmeasured factors that predict both cooperation/consensus and the presence of the NEP. To remedy the problem, the outcome equations include the appropriate selectivity correction (λ_i) term for both NEP and non-NEP participants.

The independent variables in the selection equation are geographic, demographic, and political characteristics of the estuary that might affect the baseline potential for cooperation and thus the NEP nomination (see Lubell [2003] for a similar analysis): problem severity, 1990 population density (1000 ppL/per miles^2), logged 1990 population, proportion African American, ratio of farm to non-farm income, median income, proportion Republican presidential voters, and presence of a soil and water conservation district. Hence, the treatment effects model does the dual job of controlling for non-random selection, and also controlling for estuary level contextual factors that might influence the dependent variables.[9] Appendix A provides more details about differences between NEP and non-NEP estuaries and presents the results of the selection equation.

Results

Table 2 reports the results of the structural models for both consensus (column 2) and cooperation (column 4). The most important results from the structural models are that the NEP does not have a significant direct influence on either consensus or cooperation, when controlling for collective-action beliefs and non-random selection. However, the reduced form models for consensus (column 3) and cooperation (column 5) suggest a different conclusion. Reduced form models are produced by substituting all of the structural equations for the collective-action beliefs into the structural equations for consensus/cooperation (i.e., substituting equation 2 above into equation 1, and then estimating the coefficients for all exogenous variables). The slope coefficients for the NEP variable in the reduced form models capture the *gross* effect of the NEP, which incorporates any indirect effect of the NEP through collective-action beliefs. In the reduced form models, the NEP coefficient is significant and positive in the consensus model, increasing the level of consensus by 7 percentage points. However, the NEP coefficient is insignificant in the reduced form cooperation model. These gross effects are initial evidence for symbolic policy—NEP stakeholders exhibit more consensus, but overall levels of cooperation are no different. However, the differences between the structural and reduced form models in Table 2 suggest the NEP may have important indirect effects worth examining.

These indirect effects operate through the effect of the NEP on collective-action beliefs, which in turn have a direct effect on levels of consensus and cooperation. The coefficient estimates in the structural models (Table 2, columns 2 and 4) represent the direct effects of collective-action beliefs. Consensus is higher when stakeholders perceive scientific knowledge as adequate (12 percent increase), poli-

[9] Another strategy to control for estuary-level factors is to enter them into a linear regression. However, this strategy only corrects the non-random selection problem if one assumes you have identified and measured all of the variables that might predict NEP designation. Additionally, the unmeasured contextual factors in a given estuary could cause correlated errors between respondents from the same estuary. Hence, I also conducted this analysis with regular OLS including the estuary-level variables and robust standard errors, and these analyses do not change the substantive results presented here. The OLS results are available from the author on request.

Table 2. Treatment effects models for consensus and cooperation.

	Consensus		Cooperation	
	Structural Model (N = 659)	Reduced Form (N = 808)	Structural Model (N = 661)	Reduced Form (N = 814)
Collective-action beliefs				
Scientific knowledge	0.12 (0.03)**	—	0.01 (0.05)	
Problem scope	0.02 (0.02)	—	0.04 (0.04)	
Procedural fairness	0.15 (0.03)**	—	0.12 (0.05)*	
Economic interest domination	–0.05 (0.02)*	—	–0.01 (0.04)	
Conflict expansion	–0.05 (0.02)**	—	0.02(0.04)	
Budget increase	0.06 (0.02)**	—	0.08 (0.04)	
Agency support	0.04 (0.02)^	—	0.02 (0.05)	
Trust	0.07 (0.03)*	—	0.05 (0.06)	
Policy-core beliefs				
Conservatism	0.01 (0.03)	–0.03 (0.03)	–0.11 (0.06)^	–0.13 (0.05)*
Environmentalism	0.14 (0.03)**	0.10 (0.03)**	0.04 (0.06)	0.03 (0.05)
Inclusiveness	0.02 (0.03)	0.06 (0.03)*	0.04 (0.05)	0.07 (0.04)
Institution				
NEP estuary	–0.01 (0.02)	0.07 (0.02)**	–0.05 (0.03)	–0.02 (0.02)
Selection bias coefficient (λ)	0.01 (0.01)	0.01 (0.01)	–0.01(0.02)	–0.01 (0.02)
Replacement respondent	–0.02 (0.01)	–0.01 (0.01)	0.05 (0.02)^	0.04 (0.03)^
Constant	0.22 (0.05)**	0.41 (0.04)**	0.49 (0.09)**	0.62 (0.06)**
Model fit	R^2 = 0.25 F = 160.76**	R^2 = 0.07 F = 100.81**	R^2 = 0.03 F = 20.41**	R^2 = 0.03 F = 30.52**

All entries in cells are unstandardized OLS regression coefficients, with standard errors in parentheses. Two-tailed hypothesis tests of coefficient = 0: **$p < 0.01$, *$p < 0.05$, ^$p < 0.10$.

cies as fair (15 percent increase), trust is higher (7 percent increase), higher budgets (6 percent increase), and more support from agency leaders (4 percent increase). Consensus is lower if economic interests are viewed as dominant (5 percent decrease), or there is a need to expand conflict outside the estuary (5 percent decrease). Environmentalists are also likely to report higher levels of consensus; moving across the range of the environmentalism scale increases consensus by 14 percentage points. Interestingly, the only collective-belief that significantly affects cooperative behavior is procedural fairness (12 percent increase), while moving across the range of the conservatism scale reduces cooperation by 11 percentage points. Cooperation appears to be a much more rigid phenomenon than consensus.

Table 3 reports results for the structural models of collective-action beliefs, which was estimated for each significant collective-action belief in the consensus model (Table 2, column 2). The NEP has a significant direct effect in all models except the trust model. Note that the selection bias coefficient is significant at the $p = 0.10$ level for economic interest domination, budget increase, and agency support, suggesting the effect of the NEP remains robust in the presence of non-random selection. Not surprisingly given the comparative institutional analysis strategy of the research design, the largest direct effects are on indicators of institutional processes: the NEP increased beliefs about budget support by 17 percentage points, procedural fairness by 16 percent, and agency leadership support by 12 percent, while decreasing beliefs

Table 3. Structural models for collective-action beliefs.

	Independent Variables			Selection Bias Coefficient		
	NEP	Conservatism	Environmentalism	Inclusiveness	λ	R^2
Dependent variables: Collective-action beliefs						
Scientific knowledge	0.10	–0.01	0.10	0.06	–0.02	0.04
	(0.02)**	(0.04)	(0.04)*	(0.03)	(0.02)	
Problem scope	0.12	–0.22	0.19	0.11	–0.02	0.11
	(0.03)**	(0.05)**	(0.05)**	(0.04)**	(0.02)	
Procedural fairness	0.16	–0.05	–0.02	0.10	–0.02	0.09
	(0.03)**	(0.04)	(0.04)	(0.04)**	(0.02)	
Economic interest domination	–0.12	–0.11	0.22	–0.03	–0.05	0.12
	(0.02)**	(0.06)*	(0.06)**	(0.04)	(0.03)^	
Conflict expansion	–0.10	–0.08	0.09	–0.13	–0.05	0.07
	(0.04)**	(0.06)	(0.06)	(0.05)*	(0.03)	
Budget increase	0.17	0.09	0.02	0.03	–0.07	0.04
	(0.03)**	(0.05)^	(0.05)	(0.04)	(0.03)**	
Agency support	0.12	0.08	–0.02	0.07	–0.04	0.04
	(0.03)**	(0.05)^	(0.05)	(0.04)^	(0.02)^	
Trust	0.04	–0.02	–0.10	0.17	0.03	0.05
	(0.02)	(0.04)	(0.04)*	(0.03)**	(0.02)	

All entries in cells are unstandardized OLS regression coefficients, with standard errors in parentheses. Constants are not reported, but all constants are significantly different from zero. All models include a dummy variable for replacement respondents. All F-tests are significant. Two-tailed hypothesis tests of coefficient = 0: $^{**}p < 0.01$, $^{*}p < 0.05$, $^{\wedge}p < 0.10$.

about economic domination by 12 percent and the necessity to expand conflict by 10 percent. Several of these variables, such as procedural fairness and conflict expansion, can be loosely described as "bottom-up" features inherent in the basic decisionmaking processes of estuary policy. However, NEP stakeholders also perceive greater levels of "top-down" political support in terms of agency budget and leadership, suggesting the NEP attracts significant attention from high-level politicians and administrators. Policy-core beliefs also exhibit significant explanatory power in every model, and in directions that make political sense, although the effects are less consistent than for the NEP. Both symbolic policy and political contracting would predict these positive changes in collective-action beliefs—the key question is whether attitude change is translated into behavior.

To estimate the size of the indirect effects of the NEP on consensus, Table 4 calculates the product of the NEP slope coefficient from each model in Table 3, multiplied with the slope coefficient for the relevant collective-action belief in Table 2. For example, the indirect influence of the NEP through scientific knowledge is (0.10)*(0.12) = 0.012 (may be interpreted as percentage point change in the same way as regression coefficients above). As can be seen, each indirect influence is small because even if the NEP has a substantial influence on a particular collective-action belief, that influence must be filtered through the effect of that collective-action belief on consensus. Regardless of the absolute size of the indirect effects, it is obvious that the largest indirect effects again operate through indicators of institutional processes: fairness and budget support. In addition, the indirect influence

Table 4. Indirect effects of the NEP on consensus.

Collective-Action Beliefs through which NEP Operates	Indirect Effect
Scientific knowledge	0.012
Problem scope	0.002
Procedural fairness	0.024
Economic interest domination	0.006
Conflict expansion	0.005
Budget increase	0.010
Agency support	0.005
Trust	0.003
Total indirect effects	0.067

Entries in column two are indirect effects computed by multiplying the coefficient for the collective-action beliefs (Table 1, column 1) with the coefficient for the NEP for each collective-action belief in Table 2.

through increasing scientific knowledge is also relatively large, reflecting the important role of applied scientific research in estuary policy. The total indirect effects equals (with rounding) the gross effects of the NEP displayed in the reduced form equation in Table 2. The collaborative governance style of the NEP indirectly produces consensus by changing stakeholders' beliefs, which in turn affect consensus. However, the NEP does not have an indirect effect on cooperation, because collective-action beliefs do not have a strong influence on cooperative behaviors, and therefore changes in collective-action beliefs are not translated into action. The analysis of indirect results is consistent with the symbolic policy hypothesis.

Two other aspects of the analysis provide further support for the symbolic policy framework. First, there really is no point in estimating the indirect effects of the NEP on cooperation because collective-action beliefs do not influence cooperation (with the exception of fairness, where the NEP indirectly increases cooperation by 2 percentage points). In fact, the structural model for cooperation in Table 1 does a very poor job of explaining cooperation at all. Clearly, there are other influences on cooperative behavior that continue to operate despite belief-systems, and despite the presence of a collaborative institution that may provide a forum for the evolution of cooperation. Research on environmental activism has also demonstrated a substantial "implementation gap" between attitude change and behavior—citizens are willing to say they support the environment, but report a much lower level of activism behaviors like recycling, joining an environmental group, or protesting. Words are cheap; actual behavior forces people to realize the costs of cooperation. Similarly, the costs of cooperation in an elite policy arena may be high because collections of formal rules, informal norms, standard operational procedures, professional biases, and political pressures may constrain behavior change, at least for the types of behaviors measured in this study.

Second, an examination of the differences between means for each individual item of the cooperation scale reveals one significant difference between NEP and non-NEP estuaries—stakeholders in non-NEP estuaries appear to cooperate more on permitting and regulatory activities. Of non-NEP respondents, 55 percent report shared permitting and regulatory activities, compared with 44 percent of NEP respondents (two-tailed t-test = 2.84, $p < 0.01$, unequal variances assumed). Non-

NEP respondents appear to be cooperating more on policy activities generally associated with command-and-control institutions. For example, prior to formally publishing requirements for a National Pollution Discharge Elimination System discharge permit, water quality agencies often consult with wildlife or health agencies to ascertain the strictest applicable water quality standards for a particular water body. One possible interpretation of this intriguing difference is that the presence of collaborative institutions actually reduces this type of regulatory activity in an estuary, which would be consistent with symbolic policy. Reducing regulatory activity is also consistent with the rhetoric on collaborative institutions, which are often portrayed as mechanisms to avoid the economic costs of additional regulations without compromising environmental benefits or other policy goals. However, another interpretation is that estuary stakeholders have shifted their resources into a different vector of cooperative behavior, one that I have not adequately measured in the context of this survey.

CONCLUSION

This analysis suggests that collaborative institutions indirectly increase levels of consensus by changing collective-action beliefs, but may not change levels of cooperative behavior. Symbolic policy would predict exactly this pattern—creating the perception of consensus, without the behavioral follow-through. Cooperative behavior may be linked to a set of political, economic, or social constraints that insulate it from both changes in beliefs and the emergence of collaborative processes.

These results provide a serious warning for proponents of collaborative institutions—they should not be content with only reports of positive changes in stakeholder attitudes and relationships. Even changes in the structure of social networks, as reported by Schneider et al. (2003), may not be sufficient to increase levels of cooperation. For collaborative institutions to fulfill their promise of remedying the pathologies of command-and-control institutions, they must actually lead to changes in the behavior of both government agencies and private users of natural resources. As with any policy, these behavioral outputs must then be followed by actual improvement in the targeted environmental problems. Because this analysis shows that beliefs are relatively malleable, tracking improvements in environmental outcomes does not only mean asking people whether they think conditions have improved. Rather, as any good environmental scientist will testify, collaborative institutions should collect objective data about environmental conditions such as water quality or biological indicators.

Unfortunately, collaborative institutions often ask people to engage in new forms of behavior that are outside their standard operating procedures and therefore not rewarded by the political, economic, and administrative incentives embedded in existing policies. For collaborative institutions to succeed, policy-makers need to find mechanisms for rewarding participation, especially in the early stages when the advantages of collaboration are not clear. These mechanisms include a sustained financial commitment to maintaining collaborative partnerships; for example, many NEP participants were very worried that their work would be fruitless because EPA did not initially have money available for implementation of conservation plans. The Estuaries and Clean Water Act of 2000, which provided funds for implementing NEP management plans, helped assuage some of these fears. In addition, collaborative institutions thrive on a sustained personnel commitment because the policy networks that form during the planning process often fall apart when critical people are replaced. Not surprisingly, these recommendations are similar to those offered by other policy implementation frameworks, such as Mazmanian and Sabatier (1989).

Of course, from the political perspective, symbolic policy makes perfect sense to bureaucrats or politicians who may be trying to smooth ruffled interest group feathers without paying the costs of significant progress. Instead of a new set of regulations that could trigger the wrath of powerful economic interest groups, an elected official may prefer to offer an agitated environmental group a chance to participate in a collaborative group. Similarly, an environmental agency may elect to participate in the same collaborative group in order to insulate their established core regulatory functions from outside interference. In short, the symbolic progress offered by a collaborative institution could function to maintain an established political economic equilibrium.

While these implications appear troubling for collaborative institutions, the limits of this study must be kept clearly in mind. Watershed partnerships and the NEP represent only one species of collaborative institution, and only a limited range of cooperative behaviors were measured. Hence, while the analysis provides important circumstantial evidence for symbolic policy, the findings in this study cannot be considered the "smoking gun" that condemns collaborative institutions. The more important contribution of this study is identifying a theoretical framework—symbolic policy—that can be fruitfully applied to understand the criticisms of collaborative institutions. Until now, the criticisms were not integrated by any theoretical framework and could be classified as the typical political "grenade lobbing" that occurs with any new policy. On the other hand, the political contracting theory has been fruitfully used to discuss the benefits since early on in the study of collaborative institutions (Lubell et al., 2002; Ostrom, 1990; Weber, 1998). From an epistemological perspective, having two theoretical paradigms with competing predictions leads to more research progress.

Consequently, more research is needed to confirm, disconfirm, or refine the conclusions of this analysis. The most important question is whether my measures of cooperative behavior are really capturing the correct behaviors. Perhaps collaborative institutions lead to new forms of cooperative behavior that are outside the patterns of collaboration that developed in the traditional, adversarial environmental policy institutions. The fact that non-NEP stakeholders cooperate more on regulatory activities suggests NEP stakeholders may have discovered a new set of cooperative behaviors that accomplish the same policy goals of regulation, but in a less coercive manner. Although I relied on a great deal of case study work in the NEP and Bardach (1998) on interagency collaboration to identify the range of cooperative behaviors, I may have left out these new forms of behavior.

Alternatively, it is possible that NEP and non-NEP stakeholders are engaging in the same types of cooperation, with the same frequency, but that each instance of cooperation has a higher value in NEP than in non-NEP estuaries. Bardach (1998) highlights the difficulty of measuring "collaborative capacity," and argues that it cannot always be boiled down to objective counts of activities because the productivity of each activity may vary. For example, participation on a joint research project may be more productive in the high trust situations produced by collaborative institutions rather than the low trust context of adversarial institutions. I use frequency measures of cooperation that would not capture the value-added from each instance. However, if the value of collaboration is higher in collaborative institutions or if new forms of collaboration are occurring, it should be possible to attribute a change in environmental outcomes to collaborative institutions. Hence, an important remaining research task (besides trying to develop better measurements of cooperation) is to compare changes in environmental outcomes in watershed conflicts with and without collaborative institutions. If collaborative institutions really do not improve environmental quality, or at least slow down the rate of decline, then the label of symbolic policy is well deserved.

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APPENDIX A: SELECTION OF ESTUARIES AND SELECTION EQUATION RESULTS

The quasi-experimental design in this paper compares 20 estuaries with the NEP to 10 without the NEP. For the NEP estuaries, I attempted to include all 28 estuaries that are currently in the program, but only 20 agreed to participate. Fortunately, the 20 NEP estuaries are well-distributed geographically and chronologically across the five cohorts (tier I through tier V) of the NEP program.

Because there are regional similarities in environmental problems and political cultures, I used geographic proximity as the main criterion to select non-NEP estuaries. The secondary criterion I used was population density. Even if estuaries face the same variety of environmental problems within a region, the severity of these problems is exacerbated by the intensity of human settlement.

Table A.1 compares the NEP and non-NEP estuaries by region and by the geographic, demographic, and political independent variables used in the selection equation portion of the treatment effects model (see Lubell [2003] for a similar analysis): problem severity, estuary area, 1990 population density (1000 ppL/mile^2), logged 1990 population, proportion African American, ratio of farm to non-farm income, median income, proportion Republican presidential voters, and presence of a soil and water conservation district. As can be seen, NEP estuaries are generally larger, more densely populated, richer, and have more environmental problems, and a history of prior local environmental institutions. The geographic distribution of NEP estuaries makes it difficult to find matching non-NEP estuaries with directly comparable levels of development within the same region. Unfortunately, picking estuaries from different regions with very similar population densities would sacrifice other regional similarities.

The treatment effects model provides some purchase on this problem by directly entering these estuary characteristics as independent variables in the selection equation. While the survey data comes from only 20 estuaries, the probit selection equation takes advantage of data available for all 105 major estuaries in NOAA's Coastal Assessment and Data Synthesis System. The variables in the selection equation are measured at the estuary level, and each survey respondent is assigned the data from

Table A.1. Comparison of NEP and non-NEP estuaries.

	NEP Estuaries	Non-NEP Estuaries
Geographic Factors		
Problem severity^	0.577 (0.065)	0.438 (0.044)
Estuary area (1000 mi^2)	7.773 (2.354)	7.147 (5.156)
Population density 1990 (1000/mi^2)^	0.728 (0.216)	0.311 (0.095)
Log population**	13.664 (0.395)	11.201 (0.241)
Demographic factors		
Proportion African-American	0.107 (0.017)	0.127 (0.017)
Farm/non-farm ratio**	0.007 (0.002)	0.015 (0.002)
Median income ($1000)**	31.731 (10.227)	26.702 (0.725)
Proportion Republican voters	0.446 (0.014)	0.445 (0.009)
Institutional Factors		
Soil and water conservation district*	0.395 (0.155)	0.033 (0.018)

Data extracted from NOAA's Coastal Assessment and Data Synthesis System (http://cads.nos.noaa.gov/). Contact author for more details. Cells contain mean values in each estuary, with standard error in parentheses. T-tests of differences in means = 0, with unequal variances assumed: ^$p < 0.10$, *$p < 0.05$, **$p < 0.01$.

the estuary in which they are located. Hence, the probit selection equation is run simultaneously on the individual survey respondents from 30 estuaries, plus 75 estuaries without survey respondents. To avoid giving too much weight to the information provided by an individual survey respondent, the probit selection equation weights each survey respondent by (1 per number of survey respondents in the estuary). Following Heckman's two-step procedure as implemented by LIMDEP, the estimated inverse Mill's ratio from the selection equation is then included in the regression outcome equation for only the survey respondents (Achen, 1986; Greene, 2000; Maddala, 1983). The standard errors are also corrected as suggested by Greene (2000). Because Heckman's procedure is not fully efficient, conclusions based on standard definitions of statistical significance are conservative.

Table A.2 presents the results of the selection equations for the treatment effects models presented in Table 2 of the text. I drop estuary area because it causes problems with model convergence. As can be seen, the population size and conservation district variables are significant and the model fit statistics show the selection equation does an adequate job of predicting the presence or absence of the NEP.

APPENDIX B: VARIABLE CONSTRUCTION

Unless otherwise noted, all variables are measured on a disagree–agree scale with integer response values ranging between [0,10], with 0 = strongly disagree and 10 = strongly agree. For purposes of analysis, all variables were linearly transformed to a [0,1] range.

Dependent Variables

Consensus

How would you characterize the level of agreement among estuary stakeholders on (variable averages the responses to the following statements on 0 to 10 disagree–agree scale):

Table A.2. Probit selection equation results for treatment effects models.

Geographic Factors	
Problem severity	0.05 (0.48)
Population density 1990 (1000/mi^2)	–0.13 (0.17)
Log population	0.31 (0.10)**
Demographic Factors	
Proportion African-American	–2.39 (1.95)
Farm/non-farm ratio	–6.17 (14.82)
Median income ($1000)	0.04 (0.03)
Proportion Republican voters	–0.98 (2.49)
Institutional Factors	
Soil and water conservation district	1.40 (0.59)*
Constant	–4.97 (1.86)**
Model Fit Statistics	
Percent predicted correctly	69 percent
McFadden R^2	0.21
$|^2$ (8 df)	44.49**

Entries in cells are parameter estimates from the probit selection equations of the treatment effects models. All treatment effects regressions in the analysis are based on same selection equation. Standard errors in parentheses. Hypothesis tests of coefficient = 0, ^$p < 0.10$, *$p < 0.05$, **$p < 0.01$. N = 923 for all models, due to inclusion of all NOAA estuaries for estimation of selection equation.

- The causes of estuary problems.
- The severity of problems.
- The amount and type of research needed.
- The best policy tools to address problems.
- The economic consequences of estuary policies.
- The environmental consequences of estuary policies.

Cooperation

In the past 2 years, have you or your organization (variable sums number of "yes" answer to following statements):

- Shared information with another organization.
- Shared personnel with another organization.
- Collaborated on one or more joint research projects.
- Collaborated on one or more joint grant or funding proposals.
- Participated in the development of a new interagency taskforce or partnership.
- Signed a memorandum of understanding or agreement with another organization to formalize commitments to estuary projects.
- Shared permitting or regulatory activities relating to the estuary.

Independent Variables: Beliefs about Problem Characteristics

Problem Scope

Would you say that a full resolution of the problem would require changes in the activities or behavior of a small number of citizens and businesses, would it require changes of almost everyone in the estuary, or somewhere in between? 0 = Only a small number would need to change, 10 = Almost everybody would need to change.

Scientific Knowledge

On average, do you perceive the level of scientific understanding about the causes and consequences of problems in your estuary to be very inadequate, very adequate, or somewhere in between? 0 = Scientific understanding is very inadequate, 10 = Scientific understanding is very adequate.

Independent Variables: Beliefs about Institutional Processes

Conflict Expansion

When conflicts arise, do you think that you can resolve conflicts to the satisfaction of your organization with the partnership, or do you think your organization will need to shift the dispute to courts, political, or other administrative arenas? 0 = Resolve conflict inside partnership; 10 = Shift disputes outside partnership.

Procedural Fairness ($\alpha = 0.76$)

1. Overall, the decisionmaking process in the partnership is fair to all stakeholders. Disagree/Agree.
2. My organization's interests and concerns are adequately represented in the partnership. Disagree/Agree.

Economic Domination

Economic interest groups have an undue influence on partnership decisions. Disagree/Agree.

Budget Increase

In the past 2 years in your estuary, do you think that expenditures on all estuary or watershed protection efforts have declined significantly, declined slightly, not changed, increased slightly, or increased significantly? Higher numbers indicate increase.

Agency Support

How has the support for estuary policies among agency or administrative leaders in your estuary changed in the last two year? Has it declined significantly, declined slightly, not changed, increased slightly, or increased significantly? Higher numbers indicate increase.

Independent Variables: Beliefs about Other Stakeholders

Trust

Thinking about the range of contacts you have had with other stakeholders, do you completely trust these stakeholders to fulfill the promises and obligations made on each issue in the context of the partnership, completely distrust them, or somewhere in between? 0 = Completely distrust, 10 = Completely trust.

Independent Variables: Policy-core Beliefs

Environmentalism

In general, how would you describe your policy orientation on estuary issues when tradeoffs between environmental protection and economic development are important? 1–7 scale; 1 = pro-development, 7 = pro-environment.

Conservatism ($\alpha = 0.70$)

1. Preserving the rights of individual citizens is more important than protecting the environment. Disagree/Agree.
2. In general, government agencies and regulations intrude too much on the daily lives of private citizens. Disagree/Agree.

Inclusiveness

Maximizing the scope of public participation in environmental policy improves policy effectiveness. Disagree/Agree.