Sustaining Joint Ventures through the Exchange of Resources: A Study of 41 Water-Related Projects in Southwest Florida.

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1. INTRODUCTION.

Understanding how political actors engage in collaborative behavior in fragmented policy arenas is extremely important, and this is particularly true when the use of finite public goods is at stake (Feiock and Scholz, this volume). Collaboration may reduce the potential occurrence of conflict among users, inform parties about better ways to avoid negative externalities, and create the conditions under which cooperative behavior can firmly develop. Given the important effects that collaborative initiatives may produce, it is only logical that the bulk of research usually concentrates on studying how to overcome the initial obstacles to collaboration in the presence of excessive fragmentation.

However, less attention is usually paid to getting to know *how collaboration can be sustained in time.* This should be a crucial component in the research agenda of students of collective action dilemmas, since it seems clear that the continuation of these practices, rather than their mere emergence, is what makes the solutions to these dilemmas more feasible. Fortunately, recent important progress has been made by scholars in both political science and public administration on how collaboration can be achieved and extended (cf. Feiock 2005, Scholz and Stiftel 2005, Sabatier et al. 2005, Koontz et al. 2004). This research continues on this path and provides a first needed take to explain how collaboration can be sustained when actors engage in the exchange of resources that are needed to accomplish the successful implementation of common projects.

In particular, I will analyze the behavior of organizational actors engaged in joint ventures sponsored by the Southwest Florida Water Management District (SWFWMD[1]). These joint ventures adopt the form of projects designed to protect water quality, ensure water supply, protect natural habitats, and prevent flooding in the southwest region of Florida –an area characterized by rapid development that demands highly coordinated efforts in order to protect natural resources efficiently.

Collaborative projects are particularly important to overcome the negative effects that purely rational and non-coordinated behavior would have for the maintenance of the ecological balance in water-rich Florida. They function as forums where actors build and maintain joint visions on how to protect natural resources, hence making second-order collective action problems less likely to develop. The importance of comprehending how actors in these joint ventures can create the basis for sustained collaboration lies in that this sustainability ensures that communication among partners in a relationship is fluid, which eases the path to the solution of first-order collective action problems that can take place only after the second-order dilemmas are overcome.

In addition, studying the sustainability of collaboration is crucial in relatively small policy arenas where the possibilities of "shopping around" for collaborative partners are limited. In these arenas, the breakdown of relationships previously characterized by collaborative practices can spiral rapidly toward conflict, as it was the case with the Tampa Bay "water wars" in the 1970s and 1980s when local governments engaged in costly court battles over rights to groundwater use (Dedekorkut 2005). Once relationships deteriorate, it is extremely costly and time consuming to rebuild them –if they can be reconstructed at all. By explaining what extends collaboration, this research will lay out some initial conditions under which the costly results of defection are avoided in the southwest section of Florida.

Specifically, I ask how the exchange of resources among partners in these projects affects their willingness to continue collaboration in the future, and determine whether some resources are more important than others in making actors adopt

[1] From now on, "the district" or "SWFWMD" indistinctively.

collaborative attitudes. In so doing, I test the expectations of Resource Exchange theory, an underutilized tool in the realm of policy studies (O'Toole 1997) that can improve our understanding of how cooperation takes place when actors lack natural incentives to drop their free-riding behavior.

I will start by describing the uses of water in Florida in general and southwest Florida in particular. The state is known for the large availability of the resource, but high rates of development and rapid increase of the population create the typical problems of overuse of common-pool resources described elsewhere (see Ostrom 1990, Ostrom et al. 1994). I later move to the presentation of the main hypotheses tested in this paper, which link the exchange of resources to the willingness to sustain collaboration. I then introduce the details of the data collection process, measurement of variables, and estimation technique. Finally, I present the results and discuss their relevance for our understanding about how collaboration is more likely to be sustained in the presence of natural incentives to engage in disjointed decision-making.

2. WATER IN SOUTHWEST FLORIDA: INCREASING USE AND THE EMERGENCE OF COLLABORATIVE PROGRAMS.

Florida is one of the water-rich states in the U.S. *par excellence*. The level of precipitation from rainfall amounts to an average of 53 inches per year, and its territory contains approximately 3 million acres of wetlands, 7,700 lakes greater than 10 acres, and more than 1,700 streams (Fernald and Purdum 1998).

While rich in the gross availability of the resource, the state faces the need of carefully managing water, mainly because population grows at a fast rate. Almost 16 million inhabitants lived in Florida in the beginning of the new millennium according to the U.S. 2000 Census, and this number is expected to climb to almost 26 million by 2030. [2]

[2] Source: Demographic Estimating Conference Database, updated July 2005. For more information on demographic composition in the State of Florida, visit the website of the "Office of Economic & Demographic Research" of the Florida Legislature at: http://edr.state.fl.us/conferences/population/demographic.htm (last accessed April 30th 2006).

Such growing population demands more water and forces policy makers to adopt innovative measures in order to cope with the dangers of overuse. According to data collected by the U.S. Geological Survey (USGS), in the year 2000 Floridians withdrew more than 20 million gallons of water per day from both saline and fresh sources (Marella 2004). Fresh water came from both groundwater and surface sources; the biggest withdraws from groundwater sources were destined to public supply (43% of the total groundwater withdraws), while the main utilization of surface sources was made with agricultural purposes (62% of the total surface water use).

In turn, Southwest Florida –the site for this study-, contains approximately one quarter of the state's population as reported in the year 2000, with 3.99 million people living in the region –the majority of which populate the Tampa Bay metropolitan area. By the year 2000, the users in the region were the largest withdrawers of freshwater for commercial-industrial use in the state, as well as the largest consumers of saline water utilized to cool power-generating plants (Marella 2004).

The magnitude of these uses poses increasing environmental threats to the stability of ecosystems. For instance, excessive withdrawal of water from underground sources can lead to reduction of spring flows (affecting the ecosystems around them) and to the invasion of salty water into the Floridan Aquifer. Also, the excess in the utilization of surface water can have negative consequences. Over-irrigation of fields, for instance, is very likely to result in the impoverishment of the quality of both surface and groundwater sources, since the excess water that results from the irrigation can carry pollutants back to those sources (like residuals of pesticides, soluble nutrients, etc.).

In the past, water issues have been highly conflictive, even producing widespread conflict among underground withdrawers that resulted in the highly publicized "water wars" of the 1970s and 1980s, when users spent considerable amounts of money in settling their disputes in court. In part to deactivate potential sources of conflict among different actors in the arena of natural resources management in the southwest portion of the state, the Southwest Florida Water Management District (SWFWMD), the main authority for water-related issues in the area, has created a menu

of collaborative programs to encourage water users to engage in cooperative practices.[3] One of the most important programs –in terms of budgetary allocations for projects and comprehensiveness of water-related problems addressed by the projects- is the Cooperative Funding Initiative (CFI) program.

Under the CFI umbrella, different organizations present projects linked to the main areas of the district's responsibility -the protection of natural systems, the prevention of flooding, the enhancement of water quality, and the provision of water for human uses. The main goal of the applicants is to obtain financial resources from the district to pursue these projects, reducing the high costs of going *solo* in the elaboration of responses to water management problems. The district, on the other hand, also obtains clear benefits by taking advantage of local water management expertise, reducing the potential sources of conflict with the partners, and sharing the financial cost associated with the projects.

The program is carried on at the basin level, which means that applicant organizations present their projects for consideration to the district's basin boards, which make individual decisions on whether funds will be allocated to each project or not. The maximum amount of money granted by the boards can cover up to 50% of the total cost of the projects, and the process of obtaining funding is relatively straightforward and takes place over a one-year cycle. It starts every year in October, when the district holds informational workshops for potential partners interested in obtaining funds. The deadline for the presentation of applications is the first Friday of

[3] There are five water management districts in Florida (WMDs), which have regulatory capabilities to deal with the protection of water resources in the state. They can create and collect *ad-valorem* taxes, and operate with a relatively extended autonomy from other agencies and actors at the state and local levels. The SWFWMD was created in 1961 to deal with the flooding problems occasioned by hurricane Donna, but with the passing of the Water Resources Act in 1972 its powers were extended beyond that specific area. Nowadays, in addition to the goal of flood protection, the district extends its regulatory capabilities to three other main areas: 1) water supply, 2) water quality management, and 3) protection and restoration of natural systems. The organization is governed by a Governing board composed of eleven members, which appoints the Executive Director. Territorially, the district is divided in nine basins according to hydrologic criteria, each of which is governed by a board composed by members appointed by the Governor to serve 3-year terms.

December. Each filled application must contain the name of the project, the name and contact information of the *cooperator* (organization presenting the application and "contact person" representing the organization throughout the process), the issue-area being addressed by the project –water supply, flood protection, water quality, and protection of natural systems-, etc.

During the month of January, the district's staff work on reviewing the applications and the final ranking of the projects is determined by April. The Basin Board meets in June to review projects and in August approves the final budget for the following fiscal year –which contains the funds assigned to CFI projects, among other things-. Based on these decisions, contracts are awarded for the following fiscal year in the month of October, when the annual process comes to an end.

CFI projects are ideal scenarios to study collaboration, since the actors involved in them benefit greatly from their participation in the program and the issues addressed by these projects are of the greatest interest for stakeholders in the area. Also, often the CFI program promotes the collaborative relationships between stakeholders from different local jurisdictions. For instance, local governments –cities, towns, or counties- in the same district basin usually present common projects seeking to obtain funds. Therefore, the study of the CFI projects provides a great venue to study how collaboration may unfold when stakeholders act in highly fragmented systems. The next section introduces the main hypotheses tested in this paper, which link the exchange of resources among partners in the project to their decisions to sustain collaborative behavior.

3. EXCHANGE OF RESOURCES AND SUSTAINABILITY OF COLLABORATION.

When actors build relationships they become dependent on each other by exchanging resources that are necessary to reach whatever goals they may have in the beginning of their association. Scholars have proposed and tested different realizations of this phenomenon in the past (Blau 1964, Benson 1975, Cook 1977, Galaskiewicz 1979, Cook et al. 1983; Markovsky et al. 1988; Cook and Yamagishi 1992), and students of

policy have timidly explored the applications of this underutilized theoretical tool (O'Toole 1997) since the beginning of the 1980s (Rhodes 1981, 1986; Marsh and Rhodes 1992, Hanf and O'Toole 1992, Agranoff and McGuire 1998, Wondolleck and Yaffee 2000, Scholz et al 2006).[4]

For authors in this tradition of research, the main working assumption is that organizations are not self-sustained or independent from their environment, in the sense that they rarely have all the resources they need to guarantee their own survival or reach their goals.[5] As a result of this scarcity, organizations always need to secure access to sources in their environment -"suppliers"- that can provide the resources in question. In the realm of interorganizational studies, those "suppliers" are just other organizations, who are components of the *environment* previously referred to, and on which the organization in need depends.

The important part of all this is that the exchanges of resources should affect behavior. An actor receiving resources from another one obviously benefits from this exchange, and should respond accordingly by becoming more trustworthy and engaging in cooperative behavior. Is this reasoning applicable to partners in CFI projects? Does the exchange of resources between partners affect the willingness of the receiving organization to sustain collaboration with the supplier of such resources? If this is the case, which are the resources that are more important in producing sustained collaboration? Answering these questions will provide valuable insight to understand in

[4] These theoretical efforts have been grouped under different names, but "Resource Dependency Theory" and "Resource Exchange Theory" are the most common. Other denominations include "political economy model" and "dependence exchange" (see Aldrich and Pfeffer 1976 for more details). For the purposes of clarity, I will refer to the theory simply as "Resource Exchange Theory" in the rest of this paper.

[5] Resources are varied, and can be of both material and nonmaterial nature, although in studies of resource exchange the utilization of material resources is much more common. Material resources may include financial resources, information or knowledge of different nature (depending on the type of actions performed by the organization), personnel to carry on with the organization's tasks, etc. Nonmaterial resources may include legitimacy of the organization's goals, symbolic power or prestige enjoyed in the presence of competitors, etc.

which circumstances are partners in joint ventures more likely to avoid the second-order collective action problems that may develop when collaborative behavior weakens.

3.1. Identifying "Resources": A Contextual Issue.

In order to answer the questions in the previous paragraph, it is first necessary to identify the resources to be studied. Emerson claimed that the definition of a resource depends on the context, and that "…any ability possessed… (by an actor) is a resource only in relation (to)… specific other (actors) who value it" (Emerson 1976: 348). Researchers testing hypotheses derived from the resource exchange theory deal with this issue regularly and must carefully define what a resource is, depending on the topic of study or the nature of the relationships they observe.

In this work, I study the exchanges that take place in projects seeking funding under the Cooperative Funding Initiative (CFI). Hence, critical resources are those that are *more likely to ensure the successful design and implementation of the projects*. The resources identified in this context are: funding availability, technical information, public buy-in and/or political support for the project, and finally, assistance to meet regulatory requirements that make the project legally viable. These resources were identified with the assistance of an "advisory board" of active policymakers in southwest Florida that was created in the last months of 2005 and met on January of 2006.[6] Resources were not ranked in order of importance; rather, the goal of this meeting

[6] The members of this board are Dick Eckenrod, Executive Director of the Tampa Bay Estuary Program; George Henderson, Senior Scientist at the Florida Fish & Wildlife Commission; Andy Squires, Director of the Pinellas County Department of Environmental Management; Janet Kovach, former member of the SWFWMD Governing Board, and Mark Hammond, Director of the Resource Management Department, SWFWMD. In addition to identifying critical resources for projects, the members of the board unanimously suggested to study exchange of resources in the projects at the very initial stage of the application for CFI funding -in the period of time preceding the final decision of the basin boards on whether to provide funds or not. According to the opinion of the advisory board members, the application process is actually the most critical stage for the development of collaboration. It is during this stage when political negotiations take place, roles in the project for the different participants are defined, and the exchange of resources is just being established with the goal of making the project's application successful.

was to recognize the main areas of a project in which participants need to work to succeed in the design and implementation phases of the project.

After the identification of these four types of resources, I interviewed district's staff to further validate the choice of resources and verify their importance during the application process for CFI funding.[7] All the four areas of resources exchange were acknowledged as important. However, there was agreement that projects with greater chances of obtaining funding meet two conditions. The first one is the gathering of political support from stakeholders from the areas where the projects are to be implemented. This issue was identified as critical, since the main applicants for CFI funds are usually local governments that invest their own resources in the projects and may face multiple demands to invest those resources in other areas.[8] The second condition is that projects should be solidly designed from a technical perspective. The opinion of the individuals consulted was that projects need to be "as polished" as possible at the moment of presenting the applications, and that as a consequence of this, projects with a strong technical background –either with the presence of consulting firms involved, provision of technical information in the form of viability studies, etc.- tend to be ranked higher in the step prior to the basin board making decisions on funding.

For these conditions to be met, two of the resources previously identified (public buy-in and/or political support for the project and the availability of technical information) become crucial, and one should expect that a receiver of these resources would be more willing to sustain collaboration with the provider, in comparison to an actor who does not receive these resources from the partner in the project. Thus it is hypothesized that, while there should be a positive relationship between the reception of resources in each of the four areas identified above and the willingness to sustain

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[7] I am particularly indebted to Mr. Rand Baldwin, Community Affairs Coordinator with the district for his invaluable help during this stage of my research. Michael Holtkamp and Janie Hagberg, project managers with the district, also provided valuable insight about these issues.

[8] In 40 out of the 41 projects studied in this paper, the applicant was a local government in southwest Florida.

collaboration with the provider, this positive relationship should be of a *greater magnitude* –larger effect- when the resources being exchanged are technical information and public buy-in and/or political support for the project. In other words, respondents should express a greater willingness to sustain collaboration with the partners when those partners are more critical in providing the resources that are likely to make a project successful.[9]

4. OTHER VARIABLES AFFECTING THE SUSTAINABILITY OF COLLABORATION.

In addition to the relationship between the exchange of resources and the willingness to sustain collaboration in time, there are other variables that may help in explaining the dependent variable. I present these in the following pages.

4.1. The District as a Partner.

While the involvement of the district in the projects is always secured through its provision of funds to implement projects whenever they are approved, in some cases the district gets involved to a greater extent by providing other types of resources, mainly input in technical issues to make the projects more viable. The district assigns project managers to all the projects that apply for funding and in some cases the participation of these managers is so central that applicants identify the district as a "formal partner" in the project.

I introduce this variable in the analysis to control for the possibility that the presence of the district as a partner in a project conditions the responses about likelihood of sustained collaboration. Pfeffer and Salancik (2003 [1978], 49) contend that "…the final source of control (of an organization over its environment) derives from the ability to make rules or otherwise regulate the possession, allocation, and use of resources and to enforce the regulations". The district is the organization with the highest regional authority to regulate the use of the water resources in southwest Florida and the sponsor

[9] The measurement of the variables will be described in a later section.

for the CFI. In fact, the district's provision of funds makes it an indispensable actor for the viability of projects. Hence, it is plausible that respondents from other organizations exhibit a higher willingness to sustain collaboration when the district is the provider of the resources that are important to make the project viable.

4.2. The Strength of the Interorganizational Tie.

Another variable that needs to be controlled for is the strength of the interorganizational ties between the receiver and the supplier of the resources. Studies of tie strength and its effect on dyadic relationships have developed steadily after Mark Granovetter analyzed how men in the Boston metropolitan area searched for jobs (Granovetter 1973). His work showed that contacts maintained with distant acquaintances ("weak ties") provided more productive or valuable information for finding jobs than contacts maintained with friends ("Strong ties"), and attributed these findings to the fact that weak ties allow the actors to gather the benefits of non-overlapping information by reaching distant parts of an arena. Granovetter concluded that weak ties "…are the channels through which ideas, influences, or information socially distant from ego may reach him" (Granovetter 1973: 1370).

Even though subsequent work kept showing the advantageous use of weak ties in terms of information transfer in both interpersonal and interorganizational relationships (Lin et al. 1981, Roch et al. 2000), evidence of the importance of strong ties for the exchange of critical information started accumulating rapidly (Friedkin 1982, Hansen 1999, Carpenter et al. 2003). It was increasingly recognized that the weak-tie theory as it was initially developed constituted a reasonable vehicle to explain how individuals or organizations tried to meet their information needs; however, it was also acknowledged that strong ties –rather than weak ones- may be preferable when the search of innovative information is not the most pressing issue for an actor.

In politically fragmented systems, the process of building solid or strong partnerships is important since there is usually a high level of uncertainty about how credible a partner's commitment is to collaborative action. In the specific case of the joint

ventures that I study here, one way of reducing the costs of the transactions between parties in the partnership could consist in the establishment of solid or "strong" relationships through which the actor can learn more about the partner's behavior, interests and goals. In this sense, strong ties allow for an easier determination of how credible and trustworthy partners are (Scholz et al. 2006) and should help partners build relationships characterized by sustained collaboration. Hence, it is hypothesized that –in the realm of the CFI projects- organizations linked to their partners with stronger ties will exhibit a higher likelihood of sustaining collaboration.

4.3. Meeting the Organizational Expectations when Participating in the Project.

Another variable that ties closely to the reduction of transactional costs through the establishment of solid relationships with partners in these joint ventures is the expectation of respondents that their organizations will meet their goals when participating in the projects. When an organization meets its expectations, a positive precedent is created in its relationship with the partners. This could help reducing the costs of searching for potential counterparts for new partnerships by making the searcher narrow its choices rapidly to those actors with whom she has already established successful contacts in the past.

Furthermore, negotiating agreements and building common visions with partners from past successful ventures should also be less costly, since both parties have at least partial knowledge on what to expect from each other based on those past experiences. If this is the case, we should observe a positive relationship between the belief that the organization is meeting its goals in the project and the stated willingness to extend collaboration with the partner.

4.4. Project Size.

In addition to the variables discussed previously, I also control for the size of project in which the partners interact. Projects funded under the CFI program are not uniform in terms of their financial size. Some of these projects are very small, and

require lesser efforts by the partners in order to design and implement the project. On the other hand, other projects are very large in size, and require greater investments in order to be implemented, like in the case of city or county-wide water management plans that use extensive financial support and human resources.

To some extent, participating with a partner in a project of a large magnitude signals the willingness to take larger risks with that partner, and this is another way of indicating how solid their relationship is. Thus, including the size of the project in my analysis to explain the willingness of respondents to sustain collaboration with the partners allows me to control for the possibility that the responses are affected by the fact that the relationship has progressed toward the elaboration and execution of projects that demand a stronger link between the parties. Therefore, I expect a positive relationship between the size of the project and the willingness to sustain collaboration.

4.5. Individual Perception of the Importance of Water Issues.

Up to this point, the independent variables that I have presented capture features of the respondents' organizations or characteristics of their relationships with their project partners. Putting the burden of the analysis on these variables is a natural choice, since this is basically a study of interorganizational relationships. Nevertheless, we need to account for the fact that the information used to test these hypotheses –as I will explain in more detail later- come from individuals with their own attributes that may affect their responses. I specifically control for one of these attributes: the perception of importance of water issues in the area under study. It is possible that individuals who are more concerned about water issues feel the need to extend collaboration, just a reflection of their interest in solving these problems.

In the case of water management in the area under study, I explained above that the projects designed under the Cooperative Funding Initiative prioritize four main areas of management: water supply, water quality management, flood control, and protection and restoration of natural systems. Hence, if the argument described above

holds, individuals who perceive these issues to be highly important should also show a higher tendency to extend collaborative practices.

5. DATA, MEASUREMENT OF VARIABLES, AND ESTIMATION TECHNIQUE.

5.1. Data Collection.

The test of the hypothesized relations presented in the previous sections will be performed with data collected from respondents participating in 41 projects applying for CFI funding in December 2004 and December 2005. The decision to restrict the study to these projects was determined by the need to collect more reliable data. The list of projects that applied for funding in these two years was initially composed by 230 cases, for which only a total of 112 individuals were identified as "contact person" in the application forms presented to the different basins of the district.[10] As I explained above, the application form must contain various information, which includes the name of the organization acting as "cooperator" and the "contact persons" in the organization (usually the individual who is more involved in the design of the project). Since applications do not include a detailed list of individuals or organizations participating in the projects as partners, the "contact persons" are the best available source to obtain this information. Of course, the fact that 112 individuals function as "contact person" for 230 projects means that some of them take on liaison roles for more than one project.

In the first stage of the data collection process, these 112 individuals were contacted starting in March 16th 2006 by email and telephone and asked to answer a short survey providing the names of all the organizations participating in the projects (partners), the names of those organizations' representatives for the projects, and their addresses. By mid-May, we had obtained responses from 67 out of the 112 individuals

[10] The information about the applications is contained in the so-called "Budget Notebook" of each of the basins. These documents are released after each of the 6 bi-monthly meetings that basin boards hold in the months of February, April, June, August, October, and December. The notebooks contain information on CFI projects being funded, but also information on projects that are applying for funding for the next fiscal year. This information is gathered from the application forms filled in December.

(response rate of 59.82%) who provided information about the organizations and individuals involved in 99 of the original 230 projects applying for CFI funding in the last two years.

A number of individuals participate in different projects at the same time, so it was necessary to choose the projects in a way that would minimize the number of survey responses requests, at the same time increasing the number of projects available for analysis. I adopted the rule of selecting projects in a way that would ensure that respondents were not asked to answer more than two surveys, which brought the number of projects to 41. The list of respondents for these projects was comprised by 156 individuals: 129 one-time respondents, and 27 two-time respondents (individuals who participated in two projects).[11] These individuals were contacted in the second stage of data collection, and were asked to answer a 16-question survey detailing their participation in the project/s. As of August 1st, we received a total of 99 replies, which represents a response rate of 63,46%.

5.1.1. Number of Cases for the Analysis Obtained from the Surveys. The unit of analysis is *the opinion of the respondent about a partner in a project*. This means that each answered survey provides as many cases for the analysis as partners exist in the project, since the respondent is asked to provide information about each one of the partners. The 99 surveys that I collected provide a total of 182 cases for the analysis, which I use to test the hypotheses presented above.

5.2. Measurement of Variables.

5.2.1. The Dependent Variable: Sustained Collaboration. Respondents were asked to answer the following question: *"Based on your participation in this project and your relationship with the partner, would you say that you are more likely to engage in future*

[11] Individuals on this last group who returned their first survey were then contacted by e-mail and asked if they were willing to answer a second survey. If they did not reply to the e-mail request in three days, a phone call followed.

collaborative efforts, or less likely to do so?" The answer was placed in a scale ranging from 1 to 7, where 1 represents "less likely to collaborate" and 7 represents "more likely to collaborate".

The distribution of the values of the variable is skewed towards the higher values of the scale and a reduced number of cases are located in the lower values of the scale. More than likely, this is a result of the context in which the respondents answer the question. The fact that they are engaged in a common project is a sign that the main obstacles for collaboration have already been removed. Hence, there should be a tendency for respondents to locate themselves in the values of the scale that favor sustained collaboration because, everything else equal, current collaboration should be a good predictor of future collaboration.

To simplify the estimation of the model and the interpretation of the results, and given that only 7 observations scored values of 3 or less in the scale, I recoded the dependent variables into 4 categories as shown in the next table, where category 4 contains the responses "future collaboration with the partner is more likely".

Table 1. Distribution of Responses for "Likelihood of Future Collaboration with the Partner" After Recoding.

New Value (Old Value)	Frequency	Percent	Cumulative Percent
1 (former 1s, 2s, 3s, and 4s grouped)	28	15.38	15.38
2 (former 5s)	17	9.34	24.73
3 (former 6s)	47	25.82	50.55
4 ("more likely", former 7s)	90	49.45	100.00
Total	182	100.00	

5.2.2. The Main Independent Variables: Exchange of Resources with the Partner.

In order to capture the exchange of resources with the partner for each of the four areas of interest – technical information, funding, public buy-in and/or political support, and solution of permitting and regulatory hurdles- I observe:

1. whether the respondent received the resources from the partner, and

2. the number of outside suppliers -other organizations not participating in the project- that provided the resources to the respondent's organization.

For the first part, the respondents were asked to tell us whether the partner assisted the respondent's organization during the application process. Respondents answered "yes" or "no" for each of the four areas of interest and responses were coded with a 1 and a 0 respectively.[12] For the second part, respondents were presented with a list of 51 organizations that consistently participate in water-related policies and projects in southwest Florida, and they were asked again to answer whether each of these organizations provided assistance.[13] Like before, respondents answered "yes" or "no" (coded 1s and 0s) for each one of the four areas. I then added the positive mentions (the 1s) for each area, so for every respondent I could count the number of outside suppliers that provided any given resource.

Having collected these two pieces of information, the next step consists in performing the simple calculation:

$$\frac{\text{Gathering Resource from Partner}}{\Sigma \text{ Outside Sources}} \qquad [1]$$

The calculation is repeated in each of the four areas in the project where the exchange of resources is needed. For instance, a respondent that received technical information from the partner and 10 other organizations outside the project obtains a score for exchange of technical information for the partner that equals .1, while a respondent that receives the resource from the partner but only from a couple of outsiders has an exchange score that equals .5. Of course, when the numerator equals 1

[12] I used this simplified measure rather than asking respondents about the amount of assistance in each of these areas as a compromise between the length of the survey and the relative gain from asking more detailed questions; respondents were asked to provide information about every partner in the project, so the answer to this and other questions could have been extremely cumbersome for respondents had we ask them to provide more details.

[13] The list contained organizations grouped under the following categories: a) Federal Government, b) State Government, c) Regional Government, d) Local Government, e) Private and Non Governmental Stakeholders.

and the denominator is 0 (the respondent receives the resource from the partner but not from outside sources), the result of the above calculation is undefined. However, this is the representation of the maximum possible level of exchange with a partner, since there are no alternative suppliers. Thus I recode those cases with a value of 2. This value is arbitrarily chosen because it represents double the amount of dependency on the partner in comparison to the case where the partner provides the resource and there is exactly one outside source, in which case the score for exchange equals 1. Hence, the ideal values of this variable range from 0 (no exchange on the partner) to 2 (highest exchange).

This way of calculating the scores for exchange of resources accounts for the fact that the value of a partner as a supplier of resources is relative to how much the respondent's organization obtains the resources from other suppliers in the general arena of water management in southwest Florida. Receiving a resource from a partner coupled with a complete reliance on that partner to gather the resource (no outside suppliers) represents a situation in which there is the maximum possible interdependency between the two organizations, and hence the score for the exchange is maximized.

5.2.3. District as a Partner. This is a dichotomous variable coded 1 if the partner is the district, and 0 if the partner is any other organization.

5.2.4. The Strength of the Interorganizational Tie. There is a lack of consensus on what is the best way of measuring *tie strength*. The main cause of this problem is the multitude of dimensions that the definition of tie strength contains. In his original 1973 piece, Granovetter stated that the strength of a tie is "a (probably linear) combination of the amount of time, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services which characterize the tie" (Granovetter 1973, 1361). Granovetter himself performed his analysis on the effects of weak ties in the search of jobs by

capturing only one of these dimensions and measuring strength based on frequency of contacts.[14]

Unfortunately, I do not have data for each indicator of tie strength. However, I can measure the *closeness* or intensity in the relationship by observing how many common projects are shared between the respondent's organization and the partner. The common participation in a larger number of projects is a good indicator of how much interaction occurs between the organizations, hence informing us about the intensity of the relationship –one of the dimensions of the strength of a tie identified by Granovetter. Specifically, I asked the following question: "in how many other water-related projects your organization is participating with the partner". The menu of choices was: a) none, b) 1 project, c) 2 to 5 projects, d) 6 to 10 projects, and e) more than 10 projects. In this case, a coding of 5 was assigned to respondents choosing option "e", and a coding of 1 was assigned for option "a", so the higher the score, the stronger the tie.

In addition to measuring the *intensity* of the interorganizational relationship, I measure the *frequency* of the relationship between the respondent's organization and the partner *in the project under study* by asking the respondent to "please indicate how frequently you have contacted the partner in the year prior to the basin boards' decision on whether to fund the project or not". Respondents chose their answers from the following five options: a) weekly, b) monthly, c) quarterly, d) annually, or e) never. Responses were coded with a "5" when the option chosen was "weekly", and with a "1" when the respondent picked the answer "never". Hence, a higher value in this variable represents more frequent contacts between the organizations in the project.

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[14] The difficulties researchers may face in order to collect information in all of these dimensions to measure tie strength has been reflected in studies that assume that a tie is strong or weak based on labels assigned to counterparts in interpersonal relationships (like *friend*, *neighbor*, *acquaintance,* etc). However, the problem is that there is also a lack of agreement on how these labels should be interpreted. For example, Lin et al. (1981) in their study of the search of higher status jobs consider relatives, friends, and neighbors as strong ties, while acquaintances and indirect ties (friends' relatives, etc.) are considered weak ties. However, Marsden and Hurlbert (1988) classify neighbors as weak ties, as do Wellman (1978). Others do not even consider friends as strong ties (Roch et al. 2000).

5.2.5. Meeting the Organizational Expectations when Participating in the Project. The following statement was presented to the respondents: "*At this point*, it is certain that the project will meet my organization's expectations". They then located themselves on a seven-point scale, where 1 corresponded to the option "I strongly disagree with the statement" and 7 "I strongly agree with the statement".

5.2.6. Project Size. The size of the project is measured by the total budget (in thousands of dollars) assigned for its execution. This data is obtained from the applications contained in the "budget notebooks" of each of the district's basin boards.

5.2.7. Individual Perception of the Importance of Water Issues. The district prioritizes four areas of action: water supply, flood control, water quality management, and protection and restoration of natural systems. We asked respondents to "Please indicate how important are each of (these) issues in your region". For each of these four areas, respondents placed themselves along a 7-point scale where 1 means "not important" and 7 "very important". I then obtained the average of these responses, and assigned this value to the respondent.

5.3. Estimation Technique.

I estimate an ordered logit model, which is specially suited for the ordinal dependent variable that I described above. In ordered logit models (and other models utilized for ordinal dependent variables), it is assumed that the categorical dependent variable (y) is a particular realization of an underlying continuous latent variable (y^*) that generates the observed values. In other words, the observed values of sustained collaboration that I have in my sample (y) are assumed to be some categorical representation of the underlying continuous variable "sustainability of collaboration" (y^*).

5.4. A Note on Missing Data.

The rate of missing data for the 182 observations –opinions of respondents about partners in the project- was never higher than 12% for any individual question used to measured variables included in this work. However, the missing information was scattered across the observations, which means that proceeding with the analysis utilizing only those cases with complete information would have produced a significant reduction in the explanatory power in the model, in addition to the know problems of inefficiency and bias that come with a listwise deletion approach.[15]

To avoid these limitations, I utilize Amelia II, a software that implements a bootstrapping-based algorithm designed for "multiple imputation" of missing data (see Honaker et al. 2006 for more details). The program imputes *h* values for each case or cell in which missing data exists, finally creating *h* databases that can be used together to estimate the model of interest.[16] With the utilization of this software, I obtained complete data for a total of 182 observations.

6. RESULTS.

I estimated the model in Stata, performing the analysis across the five multiply imputed databases produced by Amelia II. Stata returns the average of the five different results obtained from each individual estimation. Available tests indicate that the model performs adequately.[17]

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[15] 117 observations contain no missing information in any of the variables utilized in the analysis.

[16] The default number for this quantity *h* estimated by Amelia II is 5.

[17] Since the results presented here are an average for the five separate estimations, Stata does not produce measures of fitness for the final output. All five individual estimations converged properly, and Wald tests for each of them allow to reject the null hypothesis of all the coefficients being simultaneously equal to zero. I also conducted Brant tests to check whether the "parallel regression assumption" holds. The assumption is central to the use of ordered-logit models and states that the effects of the different independent variables are equal across the different categories of the dependent variable. The Brant procedure (Brant 1990) compares the slope coefficients for all the independent variables in the j-1 binary logits that are implied by the ordered regression, where j equals the number of categories in the dependent variable. Significant

Table 2. An Ordered Logit Estimation of Sustained Collaboration with Exchange of Resources Disaggregated.

Dependent Variable: Likelihood of Extending Collaboration with Partner	**Model 1 Coefficients**
Exchange of Resources	
Respondent's organization received from partner:	
Assistance in Technical Information	0.15
	(0.34)
Assistance in Funding Issues	-0.06
	(0.33)
Assistance in Enhancing Public Buy-in and/or Political Support	0.83***
	(0.26)
Assistance in Permitting/Regulatory Requirements	0.29
	(0.25)
District as a Partner	0.43
	(0.39)
Tie Strength	
Intensity of Interorganizational Relationship	0.41**
	(0.22)
Frequency of Interaction in the Project	0.27**
	(0.15)
Achievement of Organization's Expectations when Participating in Project	0.41***
	(0.14)
Size of the Project (in thousands of dollars)	-.00004
	(0.0001)
Individual Perception of the Importance of Water Issues	0.48**
	(0.24)
Threshold1	5.63***
	1.77
Threshold2	6.38***
	(1.81)
Threshold3	7.80***
	(1.87)
N 182	
Number of Projects 41	

**p < 0.05; ***p < 0.01 (one-tailed).

values for the test signal a violation of the assumption. In every one of these tests, there was no evidence of a violation of the assumption.

Note: The entries are maximum likelihood estimates. Robust standard errors are given in parentheses (clustered by project).

The clustering of the standard errors by project seeks to correct for potential problems that would be caused if the dependent variable were affected by some explanatory variable operating at the project level that is relegated to the error term in the equation. An alternative estimation of the model without the clustering has produced similar results in the value and significance of the coefficients, but the robust standard errors are reported since this is technically more appropriate. [18]

6.1. High Dependency on the Partner for Public Buy-in and/or Political Support Increases the Likelihood of Sustained Collaboration.

When I presented arguments linking exchange of resources to the sustainability of collaboration, I predicted that more exchanges with a partner –regardless of the type of resource that was being exchanged- should positively affect the willingness to sustain collaboration with that partner. Furthermore, I argued that this positive effect should be more noticeable when the resources being exchanged were technical information and public buy-in and/or political support for the project. The evidence does not support such predictions entirely. Only when the partner provides assistance to enhance the public buy-in and/or political support for the project does the willingness to extend collaboration grow. Respondents that receive assistance on this area have a higher chance of scoring in higher categories of the dependent variable.

But how large is this effect? In ordered-logit models, the direction and the significance of the coefficients can provide some initial insight on the relationship between the variables, but the magnitude of the effect cannot be assessed without producing some quantity of interest. I will illustrate the effect by analyzing how a

[18] Alternative, and as a test of the robustness of the results shown in the table, I have estimated the model clustering the standard errors by: a) individual id of the respondents, and b) organization name. I have observed no substantial differences in the magnitude or significance levels of the coefficients obtained in those estimations in comparison to those that I report here.

change in the independent variable from its minimum to its maximum value affects the *predicted probability* of a respondent scoring a "4" in the scale measuring the dependent variable. The dependent variable "likelihood of future collaboration with the partner" has four categories, with the fourth one capturing the opinion that future collaboration is "more likely". Almost 50 % of the cases in the sample scored this value for this variable –see table 1 above-, so I choose to show the predicted probability of respondents falling into this category to preserve the simplicity in the analysis.[19]

I will calculate both the probability of obtaining a value of 4 in the dependent variable *when the value of the exchange with the partner for public buy-in and/or political support is at its maximum* (value of 2), and the probability of obtaining a value of 4 in the dependent variable *when the value of the exchange with the partner is at its minimum* (value of 0). The reader will then be able to assess the effect of the independent variable on the dependent by comparing these two quantities. I utilize Clarify (Tomz et al. 2001) to produce these calculations.[20] In order to "isolate" the effect of the independent variable, the remaining independent variables in the model are fixed at their mean value, with the exception of the dummy variable "District as a Partner" which is set at its modal value of "0" (the partner is not the district).

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[19] The formula for the calculation of predicted probabilities in an ordered-logit model depends on the number of categories of the dependent variable. In this specific case, the formula to obtain the predicted probability of the outcome of the dependent variable being "4" is

$$\Pr(y = 4) = 1 - \frac{1}{1 + e^{(X_i\beta - \tau 3)}} \qquad [2]$$

where e is the base of the natural logarithm, β is the vector of coefficients capturing the effects of the different independent variables in the model, and $\tau 3$ is the cut-point or threshold separating the third from the fourth category in the dependent variable.

[20] The software can produce a variety of "quantities of interest", including expected and predicted values, under different conditions set by the user. For calculating the predicted probabilities presented here, Clarify draws a number of simulations (1000 by default) of the main and ancillary parameters in the model (the thresholds separating the categories of the dependent variable), and calculates the predicted probabilities for the values of the dependent variable, reporting the mean of those simulations with a 95 % confidence interval.

Table 3. Predicted Probabilities of Scoring Highest Value on the Dependent Variable for Extreme Values in the Independent Variable *Exchange of Assistance to Enhance Public Buy-in and/or Political Support in the Project.*

Dependence on Partner for Obtaining Public Buy-in and/or Political Support	Probability of y=4
Lowest Dependence on Partner	.36 [.24-.51]
Highest Dependence on Partner	.74 [.53-.88]
Difference	**.38**

* 95% confidence intervals in-between brackets.

The probability of the respondent stating that future collaboration with the partner is "more likely" when the level of dependency on the partner is at its minimum equals .36. On the other hand, when the respondents is highly dependent on the partner for obtaining assistance in public buy-in and/or political support for the project, the probability of scoring the highest value for the dependent variable grows to a sizeable .74. The difference in the probabilities is equal to .38, an important amount that is also significant as proven by the non-overlapping confidence intervals for the two separate quantities.

This outcome helps us obtaining a clearer picture of the type of problems that are critical for stakeholders in the management of water in southwest Florida, an area where the lack of agreement on how to protect the resource has resulted in extended conflict in the past. Different actors have different interests in the highly controversial area of water management, and local governments –the applicants in all but one of the projects studied in this paper- face great pressure to attend multiple –and usually conflicting- demands. Money spent in building another retention pond to treat stormwater runoff or in restoring wetlands to enhance wildlife will almost certainly generate endorsements by environmental groups and individuals concerned with the protection of the ecological balance of the area. Nevertheless, this same type of project could easily antagonize

others interested in directing public funds to other areas that might need attention from the local government. Thus, gathering political support or enhancing the public buy-in for a project is almost always a top priority for decision makers, and finding a key partner that can assist in such a critical area affects their willingness to engage in cooperative behavior.

6.2. Other Variables in the Model.

When discussing control variables introduced in the model, I hypothesized that the strength of the interorganizational relationship –both inside and outside of the specific project being studied- should also be related to the sustainability of collaboration, and the evidence supports these expectations. Both coefficients capturing the relationship between the strength of tie and the dependent variable are positive as predicted, and statistically significant at the .05 level.

As it was the case when observing the impact of the exchange of resources on the dependent variable, the positive changes in the scales measuring strength of the tie also produce a sizeable change in the probability of respondents falling in the fourth category of the dependent variable (more likely to sustain collaboration with the partner in the future).

I again calculated the probability of a respondent stating that sustained collaboration with a partner is "more likely" for two conditions. In the first one, the value of the "Intensity of Relationship" (measured by the number of shared water-related projects with the partner) is maintained at its minimum (no projects shared), as is the value of "frequency of interaction" between the respondent and the partner in the project (never interacted). For the second condition, I use the maximum values for those variables ("more than 10 projects shared" and "interacted weekly" respectively). The calculated probability of scoring the highest value in the dependent variable grew from .16 under the first condition to .72 under the second one –a net positive effect of .56.

Together, these results confirm that strong interorganizational ties should be recognized as an important component of collaborative behavior needed to avoid

second-order collective action dilemmas. The reduction of uncertainty about a counterpart that comes with having shared other cooperative efforts and having established frequent interactions in the project provide distinctive opportunities to address common problems and speculate about potential solutions to them. It is easier for actors to recognize the advantages of synergetic action when these conditions are created, which probably affects the willingness to sustain collaboration in the future.

Another variable included in the model that is related to the dependent variable at a highly significant level is the achievement of the expectations of the organization when participating in the project. The coefficient is positive and significant at the .01 level, as predicted. Substantively, moving from the minimum to the maximum value of the independent variable ("strongly disagree" to "strongly agree" with the statement "At this point, it is certain that the project will meet my organization's expectations") produces an .43 increase in the probability of stating that sustained collaboration with the partner is "more likely" (.18 when the respondent strongly disagrees with the statement and .61 when the respondent strongly agrees).

This result is crucial to understand how interorganizational relationships function in the arena of water management in southwest Florida. The main lesson is that collaborative relationships need to be built and nurtured one step at a time, and that the continued collaboration that is so central to effectively solve collective action dilemmas can be hampered when individual projects become problematic for a partner. When an organization does not meet its expectations in a project –the data tells us-, the likelihood of sustained collaboration decreases. This could have an overall negative effect for the search of solutions to the problems of fragmentation and disjointed decision-making –at least in the short term- if the organization in fact decides to seek new partners, which might become an expensive task if no history of previous cooperation exists. This "frailty" of the collaborative relationships needs to be taken into account by decision-makers with a role in the promotion of initiatives such as the CFI program. Every collaborative project should be approached as an opportunity for finding consensual

responses to common problems, but knowing that the costs of not meeting expectations can deteriorate relationships previously characterized by collaboration.

The last coefficient in the model that is significant at least at the .05 level is the one linking the respondents' concern with water-related problems in southwest Florida to the dependent variable. Individuals more concerned with problems in water management have more chances of stating that future collaboration with the partners in the projects is more likely. Taking the independent variable from its minimum to its maximum produces a positive change in the probability of stating that sustained collaboration is "more likely" of .35.[21] This relationship could be the result of the personal interest that respondents have in solving water-related problems, but also of a more or less objective assessment of these problems in southwest Florida that can actually fuel real collaborative efforts in the future. In any case, the fact that a positive relationship has been uncovered between the two variables feeds the optimistic view that the community of stakeholders in the area is highly motivated to deal with the problems that human activities cause on the natural systems.

Finally, the two remaining coefficients in table 2 do not reach high levels of significance. The first one links the dummy variable "District as a Partner" to the dependent variable. The lack of significance for this coefficient shows that respondents do not state a higher likelihood of sustained collaboration when the partner is the district in comparison to other situations when the partner is some other organization. To some extent, this result is surprising, given that the district is such an important source of financial resources for each of these projects. But on the other hand, this finding couples nicely with the idea that –at least in the projects under analysis- what produces a greater willingness to engage in future collaboration is the overall benefits that the respondents' organizations obtain from the project and the contributions that the partners make to increase the likelihood of successful implementation. The formal power held by those partners is not of importance to explain the dependent variable.

[21] The minimum and maximum *observed* values in the sample for this variable were 3.75 and 7. The predicted probability of stating that future collaboration is "more likely" equaled .24 for the first value, and .59 for the second.

The last variable included in the model was the size of the project measured in thousands of dollars. The coefficient is negative but insignificant, which means that individuals working in larger projects are not more prone to sustain collaboration with their partners. Putting together projects of a larger magnitude does not seem to be enough to engage actors in extended collaboration.

7. FINAL COMMENTS.

This empirical study of 41 water-related projects in southwest Florida has shed light on how stakeholders create the conditions under which collaboration can be extended in time, avoiding the ever-costly outcome of uncoordinated behavior in fragmented decision-making arenas. I found that a partner's ability to provide political support for a project enhances the likelihood of future collaboration, but that the exchange of technical expertise, financial resources, and regulatory and permitting assistance has no significant effect on the dependent variable.

These results can help scholars in both political science and public administration understand which type of resources are central to create the conditions under which the dangers of fragmented behavior can be avoided. Particularly in local venues where constituencies demand the attention to multiple policy issues at the same time, policy-makers face the challenge of finding much needed political support and public buy-in for their ideas and initiatives. When this is the case, it seems likely that other resources that might be important to secure the successful implementation of those initiatives take the back seat in favor of the search of legitimacy for the new efforts. In other words, sustained collaboration is not the product of exchanging resources –even important ones- to make a project successful, but exchanging those that facilitate "selling" the project to the local constituencies.

This study has also found that the strength of the tie linking project partners helps explaining the likelihood of sustaining collaboration. The extension of collaborative practices is more likely when organizations participate in multiple projects together, and when they are represented by concerned individuals who frequently meet

their partners to discuss project-related issues. Furthermore, the achievement of the organization's expectations when participating in the project and the individual perception of the importance of water issues in the area of study also contribute to a improved understanding of when stakeholders manifest their intentions to continue with collaborative efforts. In general, the overall results support the claim that common visions are more easily built and cooperation becomes more likely when actors face each other directly and fulfill mutual needs (Ostrom 1990). It is under these circumstances that partners get to know each other better, which in most cases may reduce at least the costs of their negotiated transactions. This is what leaves room for an increase in the net gain that the relationship may produce.

To close this chapter, I would like to observe that –regardless of the insights produced by this study- more research is still needed to overcome current limitations in our knowledge of how resources interdependencies limit the dangers of selfish behavior. For instance, obtaining complete information on how every partner in a project relates to *every* other one would allow us to answer some interesting questions. Do projects perform better when everybody is connected to everybody else, or is the existence of a central actor functioning as a coordinator in a star-like structure a better way of securing a successful implementation? Are projects that attract more resources from outside sources more likely to produce the conditions under which the partners extend collaboration, or do projects create these conditions when they function as self-sustained entities? These questions cannot be answered with the measures of resources exchange that I use in this paper simply because there is not full knowledge of how *all the partners behave* in each of the 41 projects under study.

In addition, a thorough study of how projects evolve would improve our chances of assessing in more detail how collaboration actually unfolds. This study is limited to the linkage between resource exchange during the application process and opinions about likelihood of collaboration. Documenting carefully how exchanges take place in a project during the whole implementation process and whether or not organizational actors extend their participation in similar types of collaborative efforts after their

participation in that project would provide more definitive information on the link between exchange of resource and sustainability of collaboration.

APPENDIX

Table A.1. Descriptive Statistics.[22]

Variable	Mean	Standard Deviation	Minimum	Maximum
Likelihood of Future Collaboration	3.085	1.098	1	4
Resource Dependence				
Assistance in Technical Information	0.45	0.64	0	2
Assistance in Funding Issues	0.69	0.81	0	2
Assistance in Enhancing Public Buy-in and/or Political Support	0.45	0.70	0	2
Assistance in Permitting/Regulatory Requirements	0.28	0.57	0	2
District as a Partner	0.23	0.42	0	1
Tie Strength				
Intensity of Relationship	2.950	1.120	1	5
Frequency of Interaction in the Relationship	3.612	1.045	1	5
Achievement of Organization's Expectations when Participating in Project	5.301	1.301	2	7
Size of the Project (in thousands of dollars)	1006.423	1327.022	16	9117
Individual Perception of the Importance of Water Issues	5.807	.751	3.75	7
N=182				

[22] The means and standard deviation values presented in this table are the averages of those values for the five databases utilized in the analysis.

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