

Partnership Behavior in Disaster Relief Operations:
A case study of the response to Hurricane Sandy in New Jersey
(Atlantic City, New Jersey, 2013)

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Abstract

This study explores how agencies involved in disaster relief operations form and maintain partnerships. In April 2013, a team was sent from the University at Buffalo to the Jersey Coast to interview agencies that were involved in relief operations in response to Hurricane Sandy. We interviewed 28 agencies that ranged in size from international NGOs to one-person operations. The analysis of the data is part of an ongoing to develop a scalable, agent-based model of a relief network. We look forward to conducting more interviews around the country to understand how agencies behave in relief environments. Initial results from our case study show that around 66% of the partnerships that are relied on during the response to Hurricane Sandy were new. Because such a high percentage of partnerships are new, it is important improve our understanding of how good partnerships can be formed and managed when responding to a disaster.

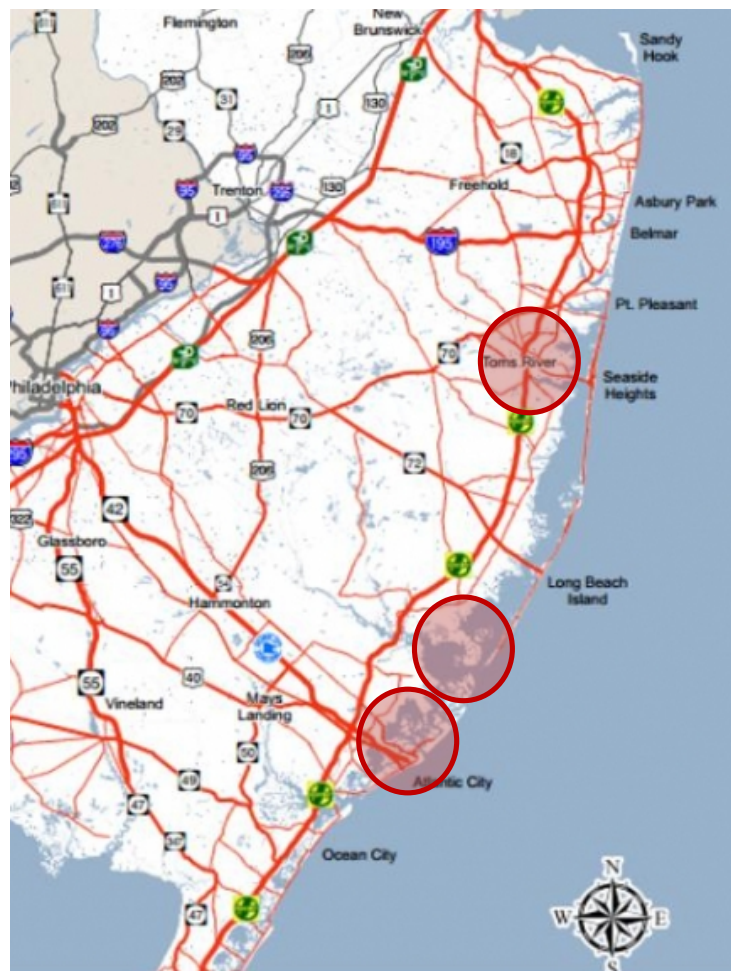
I. Introduction and Background

Hurricane Sandy hit New Jersey on October 28th, leaving 37 dead, over 2 million without power, and up to \$30 Billion in damage in New Jersey alone, making it one of the largest and most expensive storm systems in US history (U.S. DOE, 2012; Risk News Editor, 2012). New Jersey and the surrounding states have been actively recovering and rebuilding with the help of community organizations, businesses, and volunteers from around the country.

Hurricane Sandy had a profound impact on the people and the region, and this study was conducted to capture some of the data generated during the relief effort. The goal of this case study is to explore how interagency partnerships are developed and maintained in response to large disasters. Some version of the adage, “disasters are not the time to exchange business

cards,” is often quoted by professionals involved in a relief effort, and has been discussed extensively in current disaster literature with mixed results (Wishart, 2008; Conway, 2012). This case study examines the accuracy of this statement in practice as observed during the Hurricane Sandy relief effort. Initial results from surveys of 28 agencies involved in the Hurricane Sandy relief effort found that 66% of the 150+ partnerships observed in our study were formed after the disaster had happened.

The importance of partnerships in a disaster relief operation should be not be understated, but with each partnership comes a new set of people, and a new set of challenges. The objective of our research is to better understand and predict how the agencies involved in a disaster relief effort will act and interact. Data collection in a post-disaster environment (or termed disaster relief operation) could allow us to better understand the differences between pre-disaster and post-disaster networks interagency networks. We believe that more insight into the partnership formation, maintenance, and conclusion processes will help us to respond more effectively to future disasters.



In April 2013, we conducted interviews with some of the agencies that responded to Hurricane

Sandy and are helping to rebuild the New York and New Jersey area (see the map in Figure 1). This study ran parallel to several other case studies that are being conducted (e.g., Coles et al., 2012). This series of studies is designed to provide a new perspective into the operations and relationships of agencies involved in disaster relief operations (Coles & Zhuang, 2011). Each set of data will be used to develop an individual case study, and also combined to generate parameters and distributions for a network behavior model.

II. Methodology

The data presented in this report was collected during a trip to New Jersey from April 21st to April 28th of 2013. During the course of the study a research team from the University at Buffalo (UB) worked with a small local organization that was involved in rebuilding homes. This partnership provided an improved understanding of the relief effort while also increasing the legitimacy and visibility in of the research team within the local community. Working in the response effort also afforded the research team with a more open environment to interview relief agencies and assess the relief environment from an insider perspective.

To identify potential participants in the study, the research team contacted several of the community and government organizations that had been active in overseeing the effort to ask: (1) If they were willing to be interviewed; and (2) If they had any contacts that they thought might be willing to be interviewed. Additionally, potential study participants were found through Google and Facebook searches, as well as through personal and professional contacts from previous studies in the region. Potential participants were contacted prior to the trip, and the majority of the interviews took place during the April visit to the Atlantic City, Brigantine, and Tom's River areas (see Figure 1). In the week following April 2013 trip to New Jersey, follow-up interviews were conducted by phone. The interviews ranged in length from 20 minutes to an hour.

Each interview followed a set script for questions (provided in Appendix A), after discussing the Informed Consent Document with the participant and explaining a little about the study. Participant responses to the script in Appendix A were used to fill out the questionnaire shown in Appendix B. After each interview was complete, participants were given the opportunity to recommend other agencies in the area that might be willing to be in the study, and also given contact information for the research team for any questions that might arise.

III. Definitions

To understand the results of the study, it is important that we first define the different terms used in the remainder of this paper. The agencies interviewed were grouped into one of four agency categories. These categories provided a clear structure for defining agencies and examining

specific agency pairs in partnership. The four categories used in this study are: Non-Governmental Organizations, Government Organizations, Businesses, and Consortiums

1. **Non-Governmental Organizations (NGO):** This group includes churches, soup kitchens, and other community organizations or nonprofit 501(c)(3)'s.
2. **Government Agencies and Organizations (Gov):** This group includes government entities at any level (local, state, and federal), as well as public schools and other agencies that are primarily funded and operated through a government structure.
3. **Businesses (Bus):** This includes both for-profit and nonprofit businesses that sell goods and services and are not funded solely by charitable donations.
4. **Consortiums (Cons):** This group is provided as a catch-all for organizations that may not be distributing or dealing with tangible goods, but are coordinating or assisting in the relief effort by providing a place for communication and/or serving as a distributor of information. Consortiums include (but are not limited to) Voluntary Organizations Active in Disasters (VOADs), Long-Term Recovery Groups/Committees (LTRG/Cs), and other advisory or coordinative groups.

In addition, we also looked at how much experience agencies had before they worked in the response effort. We broke agencies into two categories: External (E) and Local (L).

1. An **External Agency** is one that *was not* in their area of response prior to Hurricane Sandy.
2. A **Local Agency** is one that *was* working in their area of response prior to the hurricane.

In this study we also asked questions about the strength of a partnership. The questions were adapted from research in supply chains (Donaldson and O'Toole, 2000) for use in analyzing relationships that occur in the course of a disaster relief operation. The method proposed by Donaldson and O'Toole identified 4 distinct types of partnerships, and then developed a series of questions to estimate the strength of a relationship based on two components: Belief and Action. The belief component is a measure of strength for the behavioral aspects of the relationship. The action component of the partnership is the strength of practical/physical actions or ties. The four categories of partnerships are:

1. **Hierarchical:** Low level of action and a low degree of belief. The partnership lacks communication and commitment
2. **Bilateral:** Low level of action and a high degree of belief. The partnership is a good match in terms of perspective, but not necessarily a good match logistically
3. **Discrete:** High level of action and a low degree of belief. The partnership is very effective at achieving action-oriented goals, but may not last
4. **Recurrent:** High level of action and a high degree of belief. The partnership is a good match in terms of agency perspectives and allows the agencies to achieve mutually beneficial goals. This is the most stable type of partnership

IV. Results

The results for this case study are based on interviews with 28 agencies that were involved in the relief effort along the Jersey Shore (see Figure 1) and captured information about over 150 partnerships. The agencies interviewed ranged in size from international NGOs to one-person operations. The analysis of the data is ongoing to develop a scalable, agent-based model of a relief network. Thus far we have interviewed agencies in Haiti, Joplin, Missouri, and New Jersey. Initial results indicate that roughly 34% of the partnerships relied on during the relief effort were established prior to the hurricane and are ongoing. These are categorized as *Long-term* partnerships in this study. The remaining 66% of the partnerships observed began after the tornado and can be split into two categories: (1) *One-time* partnerships that have already ended or have a planned ending date (37%); and (2) *Continuing* partnerships which appear to be continuing in perpetuity or have no expected end date (29%). This separation is shown in Figure 2, with the percentages shown more in-depth in Table 1.

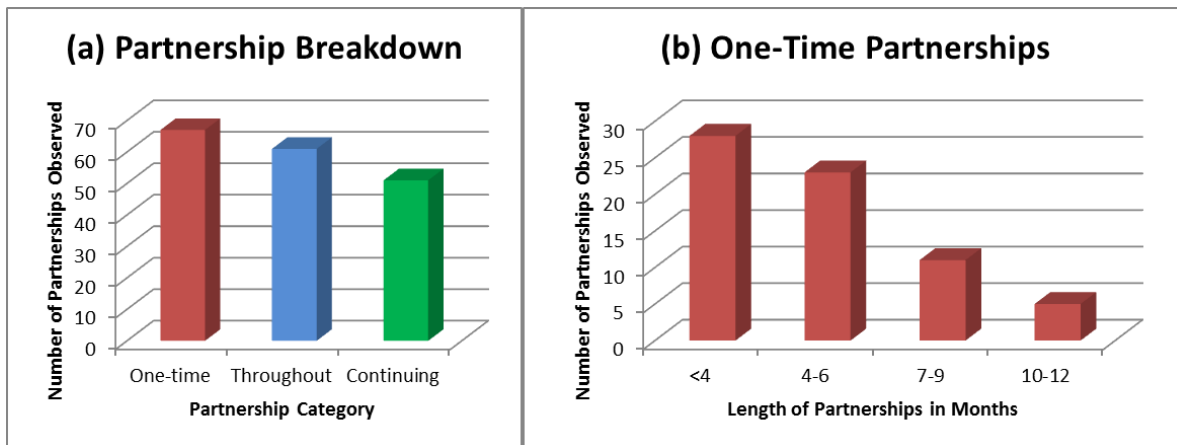


Figure 2. Of the new partnerships that we observed (those formed after the hurricane), 37% of those relationships ended (or were projected to end) by the fall of 2013 as seen in (a). The partnerships that have ended or were projected to end in the next few months are broken down in (b) by the length of the partnership.

The different relationship combinations of agencies that were observed in a partnership (e.g., NGO-Bus) provide a unique snapshot into the operations of the relief world following Hurricane Sandy. Some of the agency pairs observed are tallied in Table 1 along with some basic statistics. It should be noted that the list is not exhaustive, as it only covers agencies pairs for which at least a minimum of information was gathered in this study.

Partnerships in Table are broken up into the 3 categories defined earlier: One-time, Continuing, and Long-term. It is worth noting in Table 1 that there all agencies pairs observed experienced some spike in the number of partnerships relied on during the relief effort, and at least 50% of the partnerships in every category were new. Additionally, it is worth noting that there is a wide disparity in the % of new partnerships that are continuing to be developed and maintained even after the early phase of the relief effort (9% vs. 77%).

Table 1. The information collected through the interviews provides an insight into how different types of agency combinations were formed. Here we list the agency combinations that we observed and detail the associated statistics.

Agency Pair	# of Partnerships Observed	One-time (Began and ended after the hurricane)	Continuing (Began after the hurricane but have not ended)	Long-Term (Began before the hurricane and have not ended)
NGO-NGO	77	39%	18%	43%
NGO-Bus	19	47%	32%	21%
NGO-Gov	33	45%	21%	33%
NGO-Cons	22	5%	77%	18%
Gov-Gov	11	27%	9%	64%
Gov-Cons	4	25%	75%	0%

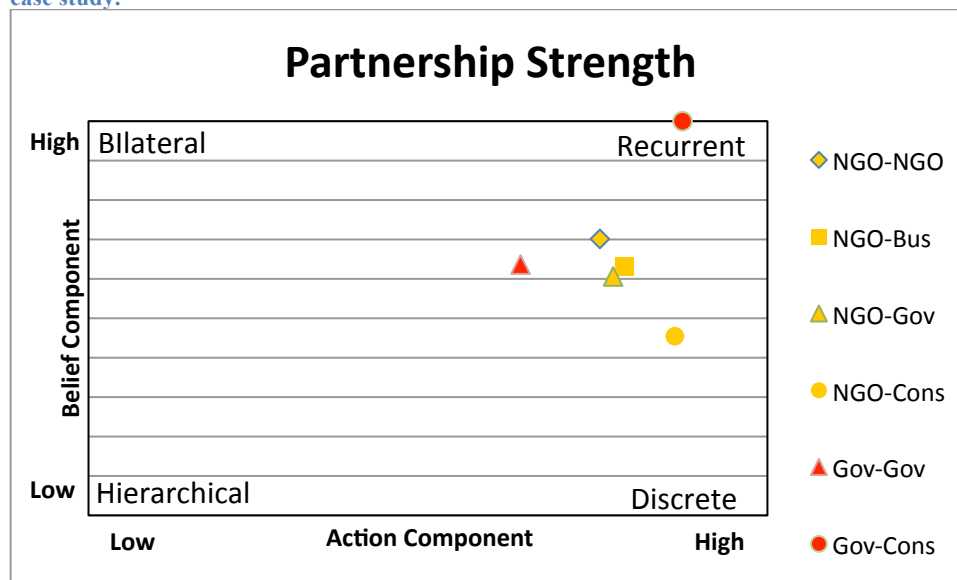
A more in-depth look at Table 1 yields the following insights:

1. **New NGO-Bus or NGO-Gov partnerships did not last for a long period of time.** Of the NGO-Bus and NGO-Gov partnerships observed, 47% and 45% respectively had ended or were expected to end within a year. If an agency plans to rely on a partnership of this type, it is important to develop it beforehand in order to maintain preparedness
2. **NGO-Cons partnerships were rarely established prior to the disaster.** Of the partnerships observed, only 18% were developed prior to Hurricane Sandy. However, these relationships tend to be very stable even if formed after a disaster happens. This can be seen by the fact that 77% of the partnerships were formed after the disaster but are expected to continue. Upon further examination of the results, it should be noted that since only 5% of the NGO-Cons partnerships observed were one-time, approximately 93% of new NGO-Cons partnerships are expected to last at least through the first year of the relief effort. This is very encouraging for the future of the community if it can be sustained and effectively utilized for prepare for future disasters
3. **Of the 11 Gov-Gov partnerships observed, only 1 of the 11 partnerships observed was a new partnership that is continuing.** All other Gov-Gov partnerships were either well-established prior to the disaster (7 of 11), or one-time partnerships (3 of 11). This is an interesting observation because it points to either a high degree of preparedness among government agencies (if the extra partnerships during the relief effort were not needed in the long-run, so no continuing relationship were formed), or a lack of capacity for any new partnerships (if government resources were already stretched thin prior to the disaster, and once the initial response effort was complete there were not enough resources to maintain additional partnerships). Unfortunately, since only 11 Gov-Gov partnerships were observed in this study, the result in this case study are not conclusive

This study also looked at the strengths of partnerships for each agency combination (as seen in Figure 3) using questions adapted from Donaldson and O'Toole (2000). In Figure 3 the relationship strength is measured according to the degree of belief and action associated with the

relationship. A relationship with a high action component can be identified by the flexibility and quantity of resources invested in the relationship. A relationship with a high belief component suggests that the partners trust one another and may share similar values or strategic plans.

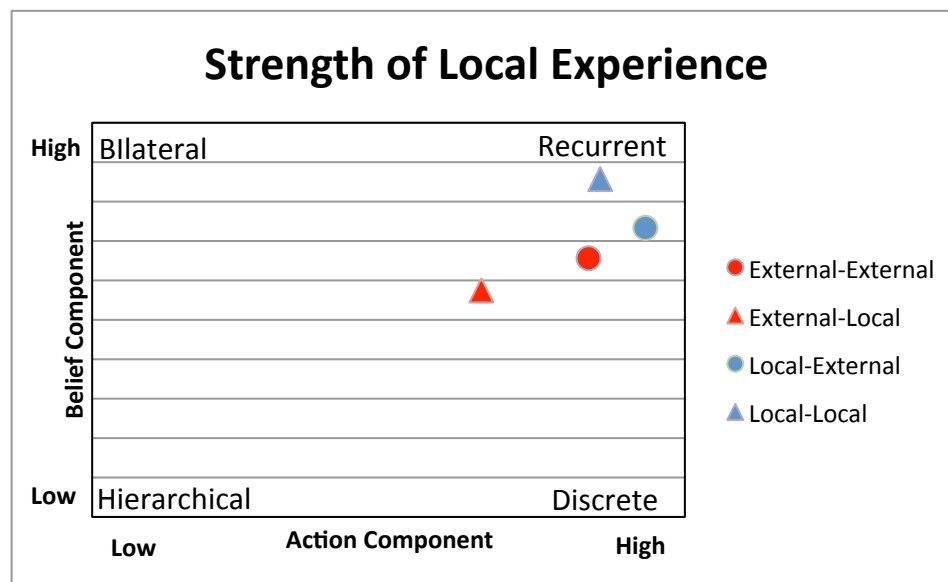
Figure 3. In each interview we asked questions about the strength of partnerships. Here we present the average strength for some of different combinations of agencies observed in this case study.



The types of agencies that are involved, and their prior experience in the disaster, can have a profound impact on the efficacy of the relationship. It should be noted that in Figure 3 the majority of the partnerships observed in the Hurricane Sandy case study were relatively strong. In Figures 3 and 4 this is demonstrated by the fact that almost all partnership a combination of have high belief and action components, and tend be close to the “Recurrent” portion of the strength diagram. However, it is also important to note that some interagency partnerships have

different levels of strength (e.g., Gov-Gov vs. Gov-Cons in Figure 3 and Local-External vs. External-External in Figure 4).

An important observation in Figure 3 is that partnerships involving NGOs tended to be viewed as being about the same strength, with the exception of NGO-Cons partnerships which had a lower belief component. The clustering of agency pairs that involved NGOs shows that, overall, there was not a particular pairing that NGOs noticed as being more useful than others. Thus, if an NGO involved in the Hurricane Sandy relief effort had to choose between an NGO, Bus, or Gov agency for a project, the type of agency should not factor into the decision. However, if a government agency (Gov) had to choose between an NGO or Gov partner and all other factors were equal, then the NGO would be a better choice since such partnerships have a stronger action component. Another item worth noticing in Figure 3 is that of the partnerships observed, those involving consortiums (Cons) tended to have the highest action components.



Unlike Figure 3, the order of agency pairs in Figure 4 do matter and indicate the perspective of the first agency listed. The only place that this makes a significant difference is with regard to the External-Local (E-L) vs. Local-External (L-E) partnerships. The placement of these separate perspectives in Figure 4 is especially insightful because it indicates that external agencies have a much lower perspective on the action component of the partnership when working with L than vice-versa. This disparity can result in some interesting tensions because E's appeared to be more likely to prefer E-Es over E-L partnerships. However, L's tended to view all partnerships (L-E or L-L) as very similar, though L's reported a slightly higher belief component for L-L partnerships and a higher action component for L-E partnerships.

V. Discussion

In the course of the study, there were several interesting dynamics that were noticed by the research team. As we continue to work in the area of disaster relief, there are two key dynamics that might play into future work in the area of partnership efficacy during disaster relief operations.

1. **Does a sustained presence mean a better reputation?** One thing observed in the course of the project was that disaster survivors tended to speak more highly of organizations that sustained a longer-term presence in the impacted community, *even if it was in a reduced operational capacity*. This is not to say that agencies should stay indefinitely or invest beyond their area of expertise; rather, if an agency would like to maintain relationships for long-term preparedness they should slowly scaling back efforts rather than leaving abruptly. Staying at least partially invested can lead to more referrals and recognition within the relief and survivor communities.
2. **Are an agency's volunteer management practices a good indicator of partnership stability?** An aspect of partnership strength that we observed was that volunteers are a valuable resource in the relief effort, especially when skilled. One of the big issues that can impact a partnership is how well volunteers are utilized when they are shared with another agency. Volunteers are the lifeblood of some agencies. When volunteers are mismanaged, it can be detrimental to the sending agency as well as to the partnership. If an agency plans on accepting volunteers, it may be important to have a project ready even when another agency is managing the projects. Mismanaging resources from another agency is one of the easiest ways to wreck a partnership.
3. **Do bigger and more experienced agencies have more optimistic views of a relief effort?** In the course of our work, we noticed that there seemed to be a relationship between the optimism of the study participant about the overall relief effort and the number of partnerships in the disaster area, particularly if some partners were large and had previous disaster relief experience. This finding is consistent with previous work in the area of social networks. When a network is very dense and interconnected, it is more likely that agencies in the network share a common perspective (Girvan & Newman, 2002). This can be extremely beneficial if it helps the agencies involved to achieve all the necessary goals. However, if a network is not sufficiently diverse some needs could go unnoticed (Granovetter, 1983). For this reason it is important that relief networks have a clear avenue for feedback, such as an open and effective Long Term Recovery Group/Committee) where different opinions and new members can be welcomed and heard.

VI. Conclusion and Future Work

In this report we discussed our case study in partnership selection and organizational behavior as it was observed in the aftermath of Hurricane Sandy. In this particular case study the majority of our interviews were with NGOs in the New Jersey area, so many of the results are primarily

applicable in that arena. We are in the process of collecting more information to do a parallel set of interviews in New York City, primarily in the Coney Island and the Rockaway areas. We have done some preliminary interviews, and are in the process of finalizing the trip.

Some highlights of our case study include the following observations:

1. Relationships in response to Hurricane Sandy tended to be fairly strong
2. 66% of the partnerships that were used in the relief effort were new
3. Independent of the type of partner, Non-Governmental Organizations (NGOs), on average, tended to view all partnerships as equally strong and reliable.
4. 43% of the NGO-NGO partnerships were established prior to the disaster and lasted longest of all short-term partnerships with an lasted relationships relation an average length of 6 months
5. 77% of NGO-Cons relationships were established after the disaster and are ongoing
6. Close to 50% of NGO-Gov and NGO-Cons relationships have already ended and lasted an average of 5 months

In the next stage of our research we plan to use Agent-Based simulation to develop a scalable network model that will depict how many organizations might interact during the course of a disaster relief operation. Agent-Base simulation is a modeling technique that allows you to develop behavior profiles (agents) that vary slightly in some way (size, type, location), and then prescribe a set of rules for interaction. When the simulation is run, these agents will interact with one another according to the rules of the simulation, while also attempting to achieve an individual or global goal. In our simulation, we will look at how NGOs, Government Organizations, Businesses, and Consortiums can work together to achieve the common goal helping people recover after a disaster.

VII. Acknowledgements

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Appendix A

1. What is your name and the name of your agency?
2. How long have you been working in this region (or the region impacted by the disaster)?
What type of agency do you consider yourself (government, business, or NGO)?
3. When did you first start working on projects that related to the disaster relief effort? Have you always worked in the area of disaster relief?
4. What areas of work do you do, or have you done in the past, relating to the disaster relief effort? (give options from interview sheet)
 - a. When did you start working in this area?
 - b. Are you still working in this area, and if not, when did you stop?
 - c. During the time period mentioned for work in this area, did you ever take any significant breaks (greater than 3 months)?
5. Who have you worked with in your relief efforts since the disaster happened? If there are too many to think of, if you could mention representative groups and experiences, good and bad, that come to mind.
 - a. What is the agency's name (or an alias if preferred)?
 - b. What type of agency is it? (give examples of Govt., Bus., or NGO)
 - c. Do they have a larger, smaller, or similar sized operation compared to yours?
 - d. When did you start working with them?
 - e. Are you still working with them, and if not, when did you stop?
 - f. During the time period mentioned for this partnership, did you ever take any significant breaks (any period greater than 3 months)?
 - g. Work: For each partner in the research group
 - i. What are some of the projects that you worked on together, and what category of work was it (using the areas mentioned earlier in the survey)?
 - ii. Did you work with the partner during all the times that you worked in this area? If not, what time periods did you work together in this area?
 - iii. Was your partner previous active in the area prior to the disaster?
 - h. Relationship Quality: For each partner in the group, please answer the following questions, yes, no, or N/A
 - i. Our partner always keeps/kept to its promises
 - ii. It is/was in our best interest that the relationship lasts
 - iii. Our partner helps/helped us out in emergencies
 - iv. We have invested/are investing a lot in this relationship to make it work
 - i. Reasons for Partnership: For each partner in the group:
 - i. Why did you start the partnership
 - ii. If you are no longer partners, why did the partnership end? If you are still partners, what reason would be most likely to cause you to end the partnership in the future?

6. Do you have any other comments about partner selection, maintenance, or termination that you would like to share?