

IS THERE A SILVER LINING? LONG-TERM CHANGES IN INTERNATIONAL
COOPERATION LEVELS AFTER A NATURAL DISASTER

by

ANDREW JAMES SNYDER

(Under the Direction of Patricia Sullivan)

ABSTRACT

A majority of previous studies on disaster diplomacy has been limited to short-term case studies. This study advances disaster diplomacy by increasing the number of disasters investigated, as well as incorporating international relations cooperation theoretical arguments to test possible consequences of offering aid to an afflicted state. Using Joshua Goldstein's conflict-cooperation scale, the thesis compares the average cooperation level one year pre-disaster and average cooperation levels post-disaster over a two year time period. This is done to determine if disaster-related assistance by a donor state to an afflicted (recipient) state leads to greater long-term cooperation between the recipient and the donor state. Fifty-five cases are drawn from natural disasters that occurred from 1992 to 2002 in which at least 50,000 people were left homeless. Preliminary results suggest that the offer of aid increases the probability of future positive average cooperation levels.

INDEX WORDS: Disaster relief, Disaster Diplomacy, International Cooperation

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CHAPTER 1

PREFACE

As a resident of the New Orleans metropolitan area for much of my life, I grew up learning about “the big one” and hearing about what would happen when it finally hit. When Katrina hit the Louisiana and Mississippi Gulf Coast, I watched as the places I knew and loved were destroyed. After some reflection and conversations with my colleagues, I focused my studies on the potential consequences of Katrina. This project has developed from my quest to understand natural disasters and their role in the political scheme. It focuses on the long-term effects of severe and sudden natural disasters and considers the vital question: “Can anything good come from such destruction?”

International relations scholars should be concerned with natural disasters because they are not an extension of politics, nor are they the products of economic or governmental institutions. Instead, natural disasters are unique occurrences that can happen at any time, have no direct human causality and are not bounded by international borders drawn on a map. They are as likely to strike a developing country as they are to strike an industrialized country. The consequences are often equally devastating. Hurricane Katrina and the Aceh Tsunami demonstrated the human suffering and helplessness that can result from a disaster; but also triggered human compassion, a need to respond and to provide tangible help.

CHAPTER 2

INTRODUCTION

An unexpected event in one country alters the behavior of other states in the international system. This has been a mainstay of research in international relations theory since its inception. Sudden changes in the system can dramatically alter a state's perception of itself and others within the anarchic system. A largely ignored area within this scholarship has been the role that sudden natural disasters may play in altering state behavior and relationships. The recent natural disasters in South Asia and in the United States have brought increased opportunities for academic and policy inquiry into how the offer of aid to a disaster-afflicted state may change relationships between donors and recipients.

Much of the work concerning natural disasters has focused on internal and domestic responses, and discussion of ways to guard against or prevent future human and property losses. There has been limited discussion in scholarly literature and in the media on the role that "earthquake diplomacy" or "disaster diplomacy" may have played in the decision making process of neighboring states in order to improve post-disaster relations. The questions that hold some promise for further research include: Does earthquake/disaster diplomacy change state behavior? If so, is this change in behavior positive? How long do the effects of earthquake/disaster diplomacy last? Does the cooperation peak with immediate assistance, then return to pre-disaster cooperation levels? These questions have become increasingly salient with the end of the Cold War. Small neighboring states have joined new regional blocks to replace the backing of superpowers and improve their long-term viability. This project will investigate the relationship

between the offer of disaster assistance following a severe sudden natural disaster and long-term cooperation between those states.

This project argues that since 1992, as the bi-polar world collapsed, regional states have become more reliant on each other to address events that occur in their geographical neighborhood. As one state is devastated by a natural disaster, other states in the area are presented with opportunities to alter the dyadic relationship between themselves and the afflicted state. When states decide to participate in the disaster relief efforts, the afflicted state increases its trust in and interaction with the donor states. This increased trust and interaction can facilitate a continuing or sustained relationship, beyond the initial or short-term assistance. The inspiration for this project comes from three recent cases: Latin America in 1998, Greece-Turkey in 1999, and the United States and Pakistan 2005.

The first case comes from the experiences in Latin America following Hurricane Mitch in 1998. Mitch tore across Latin America, leaving several countries devastated. In the wake of the storm, regional states as well as the United States delivered large quantities of material and financial aid to the afflicted countries. In one news report, United States Army Major General John Maher commented that "some days the amount rivaled the massive World War II-era Berlin airlift".¹ Just as the Berlin-airlift showed a commitment by the United States to the stability of Western Europe, disaster diplomacy in the form of disaster assistance can express a commitment to regional stability.

In the Greece and Turkey case, the occurrence of earthquakes in each country allowed for the immediate offering of disaster-related assistance. After Turkey suffered a devastating earthquake, Greece offered immediate assistance. This assistance was reciprocated when Athens

¹ Myers, Laura. U.S. To Help Colombia on Rights. AP. November 25, 1998.

was hit by an earthquake weeks later. In the post-disaster environment, Greek Foreign Minister George Papandreou linked the disaster assisting behavior with other agreements between the two historical rivals. The assistance served as a catalyst for future accommodations by Greece in the form of territorial talks and the dropping of opposition to Turkey's European Union membership application process.

The third and final case comes from the 2005 earthquake in Kashmir. Following the massive earthquake, the United States sent aid in the form of military personnel and equipment to remote areas of Kashmir. This aid accounted for a large part of the overall international response. In addition, military cargo planes were used to transport the international aid to Pakistan, where the aid was then loaded onto American helicopters or military trucks for delivery. These helicopters and trucks were also used in the evacuation of injured Pakistanis. Following the end of short-term assistance, the United States donated a mobile army surgical hospital to continue serving the local community. According to a Terror Free Tomorrow poll, the delivery of disaster assistance has improved relations between the United States and Pakistan, especially among the general Pakistani population.² The improved opinion of the United States has given Pakistan President Musharraf greater internal leverage to pursue terrorists within remote Pakistani regions. These cases show the potential for lasting cooperation in post-disaster relationships among afflicted and aid-supplying states following severe sudden natural disasters.

The lack of existing scholarly work on disaster diplomacy that incorporates international relations literature allows this project to begin defining some research areas; there appears to be potential for explaining improved state cooperation based on the three cases briefly outlined

² Terror Free Tomorrow. 2006. "Humanitarian Assistance Key to Favorable Public Opinion in World's Three Most Populous Muslim Countries."

above. This project expands on this theme and attempt to statistically test hypotheses derived from international relations and disaster diplomacy literature. For the purposes of this discussion, severe sudden natural disasters are be defined as wind storms, earthquakes, waves/tsunamis and volcanoes. Although cooperation may exist among businesses or other groups in each country, this project is only interested in cooperation at the state level involving monetary or material exchanges or military and diplomatic agreements.

In a recent article, Louise Comfort summarizes what disaster diplomacy may be able to do and offers some guidance for this project. She writes:

even the temporary suspension of old rivalries can aid in the redefinition of a more constructive profile of cooperation among states exposed to common risks, leading to more productive modes of interaction. Identifying common elements that facilitate constructive engagement in reducing shared risk, and anticipating obstacles that may hinder such engagement, offer an important opportunity for disaster diplomacy, i.e., to build cooperation among states in other areas of interaction as well as disaster reduction (Comfort 2000: 227).

Comfort's idea serves as the major foundation of the project. I expand on her ideas and incorporate the spirit of disaster diplomacy in my investigation of post-disaster behavior.

Research on natural disasters as a state behavior changing events has been limited to this point and has primarily taken the form of cases studies. This project contributes to the study of disaster diplomacy by drawing on contemporary international relations research to develop some theoretical basis for state cooperation in the aftermath of severe natural disasters. This project hopes to provide an early statistical model, including preliminary results, that offers some insights to encourage continued study of the disaster diplomacy phenomenon.

The research project is conducted in the following manner. The following chapter discusses relevant literature on disaster diplomacy as well as state behavior and international cooperation. The theoretical foundation for the thesis and tested hypotheses are covered in

Chapter Three. Chapter Four discusses the arguments and hypotheses that are tested. Chapter Five describes the data and methodology for the research program. Chapter Six discusses the results of the empirical tests of the hypotheses. Chapter Seven the final chapter, discusses the findings and offer some avenues for future research on disaster diplomacy and international relations.

CHAPTER 3

LITERATURE REVIEW

Previous research on disaster assistance and humanitarian aid has often avoided the question of political ends. As Drury et al (2005) state, "previous studies have not included disaster assistance...apparently assuming that it is as advertised-nonpolitical" (454). This resistance to mixing politics and assistance may have limited the study of state relationships and disaster assistance thus far. Recent studies and increased interest in potential positive implications of disaster assistance and state relationships seem to have reversed this trend. Increased discussion of the politics of disaster assistance has created the new school of thought surrounding "earthquake" or "disaster" diplomacy.

The literature investigating disaster diplomacy and the potential effects of disaster assistance may have on interstate relations is small, but growing. Most of the scholarly research on the subject has been catalyzed by the 1999 earthquakes in Greece and Turkey, with subsequent research investigating other opportunities or events that could have spurred state cooperation. The basic argument from this literature contends that natural disasters create a window of opportunity for states to alter their behavior towards another state and thus alter the relationship between the afflicted state and the non-afflicted state.

Building on this emerging body of research, this paper investigates disaster assistance following fifty-five (55) unique severe natural disasters that occurred between 1992 and 2002. This project investigates the hypothesis that the delivery of disaster assistance is an important step in the disaster diplomacy process, and it will improve cooperation among states in the wake

of a natural disaster. Recent studies suggest that tenets of disaster diplomacy can be seen in case studies (Comfort 2000, Kelman 2006, and Glantz 2000). The embryonic stage of the disaster diplomacy paradigm means that many avenues of research have not been pursued, with the existing work limited to fairly short-term prospects. These existing works lack quantitative investigations and fail to capture the long-term changes in state relationships.

The failure to extend the investigation of disasters over the long term while viewing disaster assistance as a watershed moment in state relationships has left a huge gap in the understanding of the tenets of disaster diplomacy. The case studies and comparative analyses of the phenomenon offer valuable insights into some of the necessary behaviors and conditions for disaster diplomacy to occur. Although these pioneering works offer criteria for future investigation of disaster diplomacy, they lack any conclusions about post-disaster relations beyond a couple of months. The larger and more quantitative examination being proposed by this study of the disaster diplomacy phenomenon builds from the foundation laid out by previous scholars and adds this important element to the research field.

The following sections survey previous interstate cooperation and disaster diplomacy studies. A survey of previous studies defines disaster diplomacy, provides the selection criteria and variables, and links the paradigm to established literature.

Interstate Cooperation:

This project focuses on the long-term consequences of a severe natural disaster, particularly in terms of cooperation between an afflicted state and its' neighbors. When a severe natural disaster occurs, the media focus is initially directed to the affected area but the attention fades as the news cycle changes. Even with the diminished attention, the actions taken by

neighboring states during the immediate aftermath of the disaster may have consequences, positive or negative, that change or reinforce behavior in the region. It is the changes or reinforcement of behavior between an afflicted state and its neighbors that is of interest for this project.

Greek Foreign Minister George Papandreou suggests that severe natural disasters may provide the opportunity to change the behavior between states as the immediate needs of the disaster are addressed.³ Interaction between states occurs in order to facilitate any rescue and recovery efforts. By conceptualizing state behavior as a game where every previous move determines the next, it is logical to consider the behavior of a non-afflicted state in the disaster stricken state's time of need. Following a disaster, states can recall how other states behaved during this critical time. States are often stuck in a cycle of behavior, at times unable to change the behavioral norm. The need for disaster relief may provide the impetus to break the previously established cycle.

One of the major issues within international relations literature concerns the ability to create and maintain cooperation in a system with no central authority. Realist arguments suggest that cooperation is improbable because of incentives to cheat or failure to fulfill one's obligations. Therefore, realists argue, states that foster cooperation will end up worse off than if they had never tried to facilitate cooperation with another state in the first place because of the propensity of other states to take advantage of the naiveté of the cooperating state. The result, therefore, is a system with very little and only short-term cooperation between states, and not an active and long lasting cooperative relationship between two or more states.

³ Wielaard, Robert. 1999. "In wake of quake, Greece signals readiness to welcome Turkey into EU." *Associated Press* September 6.

On the other hand, liberalists' arguments suggest that cooperation is likely and can be beneficial for states, even in an anarchic system. They argue that by establishing rules for current or future cooperation and for expected state behavior, trust can be built among states. This trust allows states to improve their relative well-being, while alleviating concerns of cheating by other system members. This cooperation can be prevalent and long lasting under these circumstances. Cooperation can occur, liberalists argue, even in a self-help environment, which realists suggest exist, because the gains achieved through cooperation are greater than if all states pursued the activities unilaterally.

Within the international affairs discipline, multiple authors have written on interstate cooperation and the best way to encourage cooperation between states (Jervis 1978, Axelrod 1981, Axelrod and Keohane 1985, and Keohane 1986). These studies, as well as others, assume that the international system is lacking a central government and is thus, anarchic. This assumption suggests that states are in a self-help situation and must navigate the international system without a central authority to reward or punish other states when they act. From this understanding, theorists have devised analogies and formal games such as the Stag Hunt and the Prisoners Dilemma to explain how states should behave in order to achieve the maximum benefit from interaction with other states.

One of the most famous strategies for state behavior and cooperation was proposed in an article by Robert Axelrod in 1981. In this famous piece on cooperation among egoists, Rapoport proposes the TIT-FOR-TAT strategy. The strategy argues that the first action should be to cooperate; any future decision should reflect the other player's previous behavior. On average, this strategy produces the maximum outcome. It is therefore logical for states to follow this strategy, since the goal of international cooperation is to maximize the outcome of interactions.

Many critics suggest that this strategy has a flaw because the result of a defection in the first 'game' is a deadlocked cycle of defection. Can a severe natural disaster result in a change in a state's behavior and thus the cycle of interaction between the afflicted and non-afflicted state? The theory of disaster diplomacy argues that cooperative actions taken by states after a natural disaster can, in fact, change the nature of a dyad's interaction.

Additional works on cooperation strategy focus on the necessary conditions for any strategy to succeed. One of the main problems that plague international cooperation and communication is the incentive to lie about behavior. The value of such behavior is seen in the pay-offs originally proposed by Axelrod and Keohane. If one side defects, or lies, about their intended behavior, the cumulative effect is less than if both sides cooperate. As many scholars point out, there is an initial incentive to lie or defect. Axelrod and Keohane address the defection incentive by introducing the possibility of future interaction, the so-called shadow of the future.

Another key component necessary for cooperation according to Jervis (1976) and Keohane (1986) which relates to the incentive to lie is the presence of trust. This is a matter of perception by the two states and can be influenced by past interactions. As Jervis (1976) states: "Nation A trusts Nation B in a particular situation when it believes that B will not further its own interests at the expense of A, usually because A believes that B values the prospects of long-run cooperation between the two countries more than it values the short-run gains that would accrue by exploiting its immediate power over A." (44). Keohane (1986) expresses similar sentiments when he cites that in the long run, "reciprocity based on self-interests can generate trust based on the mutual experiences as a result of the "recurrent and gradually expanding character" of processes of social change" (21). Trust built up between states based on previous situations, therefore, can facilitate future cooperation.

The shadow of the future is an important condition because without it there would be no reason for a state to want to cooperate and thus maximize the outcome for both states. "The more future payoffs are valued relative to current payoffs, the less the incentive to defect today- since the other side is likely to retaliate tomorrow" (Axelrod 1984 in Axelrod and Keohane 1985:232). The previous quote and the TIT-FOR-TAT strategy invoke the idea of reciprocity which, as Keohane states, is "an appropriate standard of behavior which can produce cooperation among sovereign states" (Keohane 1986:1). Since a state may take advantage of temporary weakness, cooperative actions can build trust and increase the chances of future reciprocity. The urgent need for swift responses following a severe natural disaster creates a situation in which a state could choose to take advantage of the situation or cooperate. When states cooperate, they maintain cooperation or change state behavior from defection to cooperation.

Axelrod and Keohane (1985) suggest four factors that make the shadow of the future an important consideration for cooperation: Long time horizons, regularity of stakes, reliability of information about the others' actions and quick feedback about changes in the others' actions (232). All of these factors are indeed important and play a role in the interaction between neighboring states. The last two factors, and specifically the quick feedback about changes, are especially pertinent in the wake of a severe natural disaster. The immediacy of the crisis and the need for quick decisions coupled with the opportunity for a state to express a change in behavior, in the form of assistance, can break the negative cycle of a TIT-FOR-TAT strategy.

The Greek-Turkish case study reveals that the actions taken after the dual earthquakes were beneficial in future interactions between Greece and Turkey. Greece had a change of heart regarding the admission of Turkey into the European Union and as reported by the *Associate Press*, Greek Foreign Minister George Papandreou stated that the earthquake "created a new

climate,” and that “Human warmth came out of this tragedy. A message came out....That we must work for peace” (Wielaard 1999). Since the earthquakes did not wipe either state completely off the map, Greece and Turkey knew that, there would be future interactions. The cooperative actions taken in the post-disaster relations between the two states suggest that the disaster-related assistance may have helped create positive and cooperative inclinations in each state, which in turn allowed for the cooperation to continue spreading to other areas.

Axelrod and Keohane provide a theoretical base for explaining international cooperation. They suggest that reciprocal behavior and the shadow of the future provide the best explanations of interactions between states. This framework proves fruitful for other research projects and shows promise for providing a framework for the study of disaster diplomacy. The biggest shortcoming of previous disaster diplomacy studies is the lack of formal international relations theory to explain the underlying philosophy of the paradigm. The work of Axelrod and Keohane provides the maturing paradigm of disaster diplomacy a framework for future work in international relations study.

Natural Disaster Phenomenon:

The term natural disaster is potentially vague and can have multiple interpretations. The first part of the term involves nature. What exactly is meant when natural disasters are discussed? Are we only interested in Acts of God or do we cast a broader net and focus on things created by man as well as Acts of God? Drury et al. (2005) offer some insights into different types of natural disasters and how these characteristics may be used for this study. They write that in comparison to droughts, "earthquakes, hurricanes, floods and volcanic eruptions are more directly physical, devastating homes, businesses, transportation systems, lifelines, and other

infrastructure” (Drury et al. 2005:460). The ability of the event types identified by Drury et al. to create widespread physical damage is an important characteristic because of the event’s ability to quickly overwhelm the emergency response of a state. In addition, earthquakes, hurricanes, floods and volcanic eruptions cannot be triggered and focused on a particular area and therefore can strike at any moment and in limited areas. Droughts are often naturally occurring but can also be altered by human activity, or even potential malice intent when water is withheld or diverted from a state that controls the source further upstream.

The second part of the term concerns disasters. Sociologists struggle for a precise definition for disasters but offer some core properties for identification. Fritz (1961) listed the following four core properties: "Disasters are *(a) events* that can be designated in time and space, which have *(b) impacts* on *(c) social units*. The social units, in turn, enact *(d) responses* (or adjustments) to these impacts” (Fritz 1961 in Kreps 1984:311). This sociological definition supports the decision to focus on sudden natural disasters because they can be more easily defined in time and space. In addition, this project is concerned with the “*(d) responses*” to the disaster impact. The combination of Drury et al. and Fritz allows for the discussion of natural disasters and why they create an interesting avenue for the study of interstate cooperation. Several types of natural disaster could potentially fall into these categories but they also exclude a possible event type. Droughts can often take months if not years before the consequences can be observed. This is an important distinction because of the vagueness often associated with the beginning and end of a drought. Since this project focuses on the offering of aid to meet the immediate needs of an afflicted area after natural disasters, there needs to be a clear start date, if not end date. Therefore, the natural events investigated are limited to the following types of sudden natural disasters: earthquakes, windstorms, floods, volcanoes and tsunamis.

Disaster Diplomacy

The role that natural disaster assistance can play in international relations is referred to as "earthquake diplomacy" or "disaster diplomacy". The term "earthquake diplomacy" is often used to refer to the Greek-Turkish experience and to a lesser extent, the India-Pakistan experience following the 2005 Kashmir earthquake and United States-Iran experiences following the 2003 Bam, Iran earthquake. The term "disaster diplomacy" on the other hand is broader and includes all natural disasters, not just earthquakes. Ilan Kelman is a leading scholar in this broader area, having written several articles exploring the topic and the current state of research. The overarching theme in Kelman's research is whether states are more likely to cooperate after a natural disaster, and if so, what conditions were present and necessary for cooperation to occur between states.

Disaster diplomacy and its potential for altering state behavior has been discussed in the media and within limited academic circles since the 1999 earthquakes. The recent 2005 Kashmir earthquake once again revived some interest in the phenomenon within both print media and academia (Radziszewski et al. 2007). News reports filed from South Asia offered some hope that the earthquake may result in warmer relations between India and Pakistan, as occurred between Greece and Turkey. Unlike the Greek-Turk case, dramatic changes have not occurred because of the event. The difference in outcomes, thus far, following similar events in neighboring states suggests that the occurrence of a natural disaster itself is not enough to create disaster diplomacy.

In a recent article, Kelman (2006) sums up the current state of disaster diplomacy and presents a framework for future study. Previous studies investigate the Greek-Turk earthquake, hurricanes in the Caribbean Sea and drought in Africa. In a broad summary of these works, Kelman wrote: "One conclusion from these analyses is that a disaster can significantly spur on a

diplomatic process that had a preexisting basis, but a disaster alone is unlikely to generate new diplomacy. Disaster-related activities can catalyze, but do not create, cooperation" (215). This conclusion suggests that there must be some level of diplomatic relations between states and implies that the lack of disaster diplomacy between the United States and Cuba following the latter's offer to send medical personnel to the areas devastated by Hurricane Katrina prevented any tangible change in relations between the two states.

Cases studies of disaster diplomacy allow for comparative analysis of efforts surrounding natural disasters. Concerning these case studies, Comfort (2000) writes that: "(T)hey illustrate that it is not the disaster event, but the kind and mode of cooperation that is fostered among states in an environment threatened or altered by severe destruction that creates the opportunity for change in relations" (278). This suggests that the speed and type of assistance offered by a non-afflicted state may play a role in the prospects for disaster diplomacy. Natural disaster assistance appears to be the key variable in the disaster diplomacy phenomenon and distinctions should be made between non-afflicted states that do provide and those that do not provide assistance in the wake of a sudden and severe natural disaster.

The type of disaster assistance may also be important. The offering of condolences is not the same thing as actually sending in a nation's own search and rescue teams to help relief efforts. Glantz (2000) identifies three different types of disaster related cooperation that could exist: direct involvement, indirect involvement and indirect assistance. According to Glantz (2000), direct involvement includes "helping their counterparts in the affected country to cope with the disaster's impacts during the emergency phase as well as post-disaster recovery." Indirect involvement does not involve hands-on activities; rather it is represented by "a government sending funds or equipment." The final type, indirect assistance, is classified as

"verbal offers of sympathy for victims directly or through the media or a third party" (Glantz 2000:234). The differing levels of assistance identified by Glantz can be used to evaluate the strength of the signal and/or the strength of the cooperation between the afflicted and non-afflicted state. Thinking of the disaster-related cooperation as a hierarchical variable, the weakest cooperation would be the offering of indirect assistance. A mid-level act of cooperation may be the indirect involvement. Finally, the highest level, and presumably most likely to signal an opportunity for future cooperation, would be the direct involvement of a states personnel in the relief efforts. These different aid levels may provide the best indicator of a states opportunity and willingness to help the afflicted state and to improve relations.

Time:

Immediately following a sudden natural disaster, the government's role is to provide relief as quickly as possible. Disaster victims need rapid response by emergency personnel to reduce the number of fatalities. Tsui (2003) writes that "(I)n the event of a natural disaster...thousands of lives are put at immediate risk. Many can be lost within hours or days of the incident if search and rescue and other life saving efforts are delayed" (35-36). It is during this critical time frame that outside disaster-related assistance may have the greatest impact on future cooperation. It is the government's responsibility to provide a quick and adequate response when disasters occur. If a state is unable to cope on its own, then outside involvement may be critical.

One technique that has been implemented to investigate a government's response to a natural disaster is through the lens of crisis behavior, in essence linking disasters with crisis behavior. Rosenthal and Kouzmin (1997) is an example of this hybrid scholarship. They

conclude that further research needs to be done to find patterns in disaster responses. This project seeks to find patterns in international disaster responses. Another important conclusion from the Rosenthal and Kouzmin work suggests that problems with future research may occur because disaster-crises have no strictly demarcated end and that the response may not be centralized. This project addresses the research issue by expanding the time frame studied from short-term to long-term behavior, thus allowing for less precise demarcation of the disaster-crises and incorporating a broader concept of time for analysis.

The timing of cooperation following a natural disaster has been addressed by other authors. Alessi (1975) suggests that following a disaster, cooperative behavior is likely to occur. Although Alessi narrowly defines cooperation as charitable and seemingly charitable behavior, usually associated with altruism, this behavior is at the crux of disaster diplomacy. The disaster creates an opportunity for charitable, seemingly charitable or altruistic behavior by states. This behavior can then be interpreted by the assistance receiving state as an opportunity for improved relations after the immediate concerns of the natural disaster are addressed and the disaster-crisis ends.

Few studies explicitly define a time frame. An exception is Radziszewski et al. (2007) who use a seven-month time frame to investigate disaster diplomacy. While the time frame provides some insights specific to the case studies of Radziszewski et al., this time frame still fails to constitute a long-term study of the effects of disaster diplomacy. Instead, I conceptualize long-term as being the seventh month up to the twenty-fourth month after the natural disaster event. This extended time frame helps avoid the issue raised by Rosenthal and Kouzmin (1997) concerning the lack of a strictly demarcated end of the disaster as well as allowing for a

smoothing of any short-term changes in cooperation levels measurements that may have occurred based on the initial assistance.

Disaster-Related Aid:

Conventional wisdom suggests that the more severe the natural disaster, the more likely it is that disaster assistance is offered by non-afflicted states. Increased media coverage of the event can illuminate the urgent needs of the victims and prompt worldwide assistance efforts. Previous research on disaster assistance has, in fact, confirmed conventional wisdom and established a link between disaster severity and aid offered by the United States.

In a 2005 article by A. Cooper Drury, Richard Olson and Douglas A. Van Belle, the authors investigate the role politics played in United States Foreign Disaster Assistance from 1964-1995. A key conclusion from this study is the finding that the number of people left homeless had a statistically significant effect on the aid given by the United States. Given that the United States is a world-leader during the era studied, it can be surmised that other states may react in a similar manner. The Drury et al. work also plays an important role in international relations scholarship by introducing a dataset on worldwide disasters. Their findings allow for the inclusion of the number affected variables from the EM-DAT dataset into the case selection.

Alesina and Dollar (2000) broadly look at bilateral foreign assistance without narrowing the criteria directly in favor of natural disaster assistance. They find "considerable evidence that the direction of foreign aid is directed as much by political and strategic considerations as by economic needs and policy performance" (33). They also find that past colonial ties and alliances have a significant effect on aid flow. Previous positive interaction should promote future cooperation. In fact, this logic drives the disaster diplomacy literature as well as the broader

cooperation literature. Finally, the last key conclusion from Alesina and Dollar is that democratizing states received more aid than others states. These findings are consistent with Kelman (2006) and Drury et al. (2005).

Yang (2006) offers a complementary study to Alesina and Dollar. In his work, Yang investigates the impact of hurricanes on international financial flows. Yang concludes that "the response of official development assistance (foreign aid) to hurricane exposure is large in magnitude, and the size of the response does not differ greatly across countries with varying levels of economic development, democratic institutions, political connectedness to the main donor country, or geographic location" (Yang 2006:20). This suggests that something else may be at work when investigating aid flows after hurricanes. Yang reconciles Alesina and Dollar with the following statement: "It may very well be that the *level* of foreign aid is influenced greatly by political and strategic factors, even if aid's *responsiveness to disasters* is not (Yang 2006:20).⁴

The previously discussed works identify some of the forces acting on the flow of aid. Drury et al. (2005) find that severity matters, while Alesina and Dollar (2000) find that politics matter when it comes to foreign aid. Finally, Yang (2006) concludes that the level of aid, as opposed to just the response, may depend on political and strategic considerations when it comes to foreign assistance following hurricanes (wind storms). This collection of literature suggests that disaster aid is not nonpolitical as advertised and political leaders may calculate how the aid they offer is interpreted in the recipient country.

⁴ Emphasis in original

Disaster Diplomacy as Soft Power?

Kelman and others recognize that the prospects for long-term cooperation between afflicted and assisting states may be linked to improved or reinforced opinions of the assisting state. Radziszewski et al (2007) find that positive coverage of an assisting state is correlated with disaster diplomacy success. In addition, a 2006 poll by *Terror free Tomorrow* finds an improved opinion of the United States that can be directly traced to recent disaster assistance in the countries. With these conclusions, a connection can be made between the anecdotal evidence and the established cooperation paradigms.

One of the leading authors from the liberalism paradigm is Joseph Nye, Jr. who writes extensively on the role that "soft power" plays in the international community. Disaster diplomacy may change the opinion of a particular state and make it more likely to cooperate in future engagements. In his 2002 book, The Paradox of American Power, Nye declares that soft power "co-ops people rather than coerces them" (Nye 2002:9). Disaster diplomacy cannot coerce people to act in the way a state may want, but it allows them to cooperate because they recognize that working with neighboring countries is in their own interests. In addition, a strong outpouring of assistance for a state may reflect its values and present a more favorable image. In his discussion about the source of American soft power, Nye (2002) writes: "Soft power arises in large part from our values. These are expressed in our culture, in the politics we follow inside our country, and in the way we handle ourselves internationally" (Nye 2002:9). The role of disaster-related assistance should not be overlooked as a way for a state to express its' values and present a positive portrait internationally.

Comfort also alludes to the role that disaster relief can play in improving relations. She writes:

even the temporary suspension of old rivalries can aid in the redefinition of a more constructive profile of cooperation among states exposed to common risks, leading to more productive modes of interaction. Identifying common elements that facilitate constructive engagement in reducing shared risk, and anticipating obstacles that may hinder such engagement, offer an important opportunity for disaster diplomacy, i.e., to build cooperation among states in other areas of interaction as well as disaster reduction (Comfort 2000: 227).

Disaster relief interaction may cause a re-evaluation of a state's relationship with its neighbors and help define future interactions.

Summary:

Severe natural disasters have the potential to “catalyze...cooperation” in international relations (Kelman 2006: 215). The paradigm that adheres to this philosophy has been referred to as earthquake diplomacy and more broadly, disaster diplomacy. Case studies of prominent natural disasters in the 1990's suggest that state behavior can change in the wake of a natural disaster. These studies are valuable for creating a framework for future and more comprehensive studies. This project builds off of the case studies and uses the suggested framework to incorporate more instances of natural disasters. This process allows for a quantitative study to determine the long-term effects on interstate cooperation based on the assistance given to an afflicted state by non-afflicted neighboring states.

Previous studies focus specifically on sudden and severe natural disasters, in part because, compared to droughts, "earthquakes, hurricanes, floods and volcanic eruptions are more directly physical, devastating homes, businesses, transportation systems, lifelines, and other infrastructure” (Drury et al. 2005:460). In addition, Glantz (2000) identifies three different types of disaster related cooperation that could exist: direct involvement, indirect involvement and indirect assistance. Finally, the assistance time frame is important for the effects of disaster

diplomacy because many lives “can be lost within hours or days of the incident if search and rescue and other life saving efforts are delayed” (Tsui 2003:35-36). The findings from these case studies provide the basis for the hypotheses on disaster assistance type and for time frames in the wake of sudden natural disasters.

The biggest deficit in current disaster diplomacy is the failure to incorporate international relations literature into the discussion of potential effects. Although there are multiple schools of thought within the field of international relations, the liberal paradigm provides the best fit for incorporation into disaster diplomacy research. Specifically, the works of Axelrod and Keohane, and others in the same vein, who argue that reciprocal behavior and the shadow of the future provide the best explanation for interstate cooperation. This theoretical framework meshes well with the previous disaster diplomacy studies, particularly Comfort (2000), who argues that disaster relief can redefine old relationships. The following chapter combines the previously mentioned studies into a theoretical argument and suggests testable hypotheses of long-term disaster diplomacy and cooperation.

CHAPTER 4

THEORETICAL ARGUMENTS AND HYPOTHESES

The international system is, and has been, anarchic. During the Cold-War, states were able to use the competition between the superpowers to further strengthen their own position in the self-help environment. The collapse of this system has created an international system in which states are constantly seeking out gains without the benefit of pandering to one or both of the superpowers. In addition, the emergence of global communication has enabled news of events to spread around the globe in a matter of minutes. Twenty-four hour news channels further the impact of global communications as they report on stories managers and editors feel will garner ratings. Often this includes stories of human suffering, such as conflicts, accidents and natural disasters. How states have adjusted to this new environment has been the subject of research in multiple disciplines. Specifically, I investigate how states have offered assistance after a sudden and severe natural disaster and the prospect for increased long term cooperation based on decisions in the initial days after the disaster strikes.

Previous research on disaster diplomacy shows that there are cases where cooperation during and after a natural disaster has improved relations between states. The Greek-Turkish case is the most famous of all disaster diplomacy events, but researchers have proposed a multitude of other cases and arenas where disaster diplomacy may play a role. The previous research on disaster diplomacy suffers from over reliance on case studies and a limited number of researchers working on the issues. In addition, the previous authors working on disaster diplomacy do not incorporate the works by Axelrod and Keohane and other international cooperation theorists. The

addition of these important international cooperation works and the incorporation of a long-term analysis over multiple cases by this study advance the study of disaster diplomacy.

Leading Cooperation Argument:

The following theoretical arguments consider the prospects for long-term cooperation and how disaster diplomacy can catalyze long-term cooperation. The TIT-FOR-TAT strategy proposed by Axelrod and Keohane for cooperation, offers a starting point for the theoretical arguments regarding the effects of disaster diplomacy on international cooperation. The strategy is based on reciprocity; cooperation begets cooperation and defection begets defection. The altruistic or self-serving decision to offer disaster-related assistance can be perceived as a cooperative move. According to the TIT-FOR-TAT strategy, the afflicted state should respond with cooperation during the next interaction, assuming both states are following a TIT-FOR-TAT strategy for international cooperation.

Furthermore, the offering of aid can build trust, which is an important component of international cooperation (Jervis 1976). Trust develops when the potential aid dispersing state does not take advantage of the temporary crisis and instead offers to help the afflicted state during its time of critical need. This trust building, coupled with cooperation after the disaster, provides an important component for international cooperation. This trust relationship is an important development because regions, not just individual countries, face the constant threat of natural disasters. As Comfort wrote: “the temporary suspension of old rivalries can aid in the redefinition of a more constructive profile of cooperation among states exposed to common risks, leading to more productive modes of interaction” (Comfort 2000: 227). Disaster-related

assistance also helps sustain cooperation because it overcomes the incentive to lie as well as information and commitment problems.

When a state offers to send disaster-related assistance, the offer of the assistance is often completed within a week. Since time is of critical importance in disaster situations, quick delivery is necessary if the aid is to be helpful. Aid also plays an important domestic role. The offering of assistance to the government of the afflicted country makes the shadow of the future more relevant. By supporting and aiding the government during the crisis, the aid increases the probability that the government will remain in place beyond the crisis time period. In addition, the presence or knowledge of international help during this critical time period may lead to increased domestic support of the aiding country, thus allowing for greater flexibility for the disaster-afflicted government in future interactions with a donor state. Nye (2002) alludes to the role that soft-power can play in improving a nation's standing amongst its peers. The offering of international disaster assistance can be viewed as an expression of a state's values. The cooperative and supportive behavior reflects positively upon the state making the initial assistance offer.

Hypotheses:

The theoretical argument tested in this thesis contends that the most important aspect of disaster diplomacy can be captured in a neighboring country's decision at the government level to assist in the wake of a severe natural disaster. More specifically, the decision to assist is a positive or cooperative 'move' in the game suggested by Axelrod and Keohane. Conversely, the decision to not assist is a negative or defection move, but is still in fact an active decision. With this conceptualization of the disaster related assistance as a unique "move" or decision, TIT-

FOR-TAT forms the basis for future cooperation between the afflicted and assisting states. Positive or cooperative “moves” will result in future cooperation, or could signal the continuation of the current status quo when defection was an option for the non-afflicted state.

Based on these moves by non-afflicted states in the immediate aftermath of a severe and sudden natural disaster, it is possible to predict the probability of changes in cooperation levels between the donor and afflicted states. Therefore, the main theoretical argument for long-term cooperation and disaster diplomacy is as follows: The offering of disaster related-aid after a sudden and severe natural disaster will result in increased cooperation between the afflicted state and the aid state because the assistance creates opportunities and signals willingness for state-level collaborations if interpreted as a positive or cooperative “move”. The theoretical argument focuses on disaster assistance in the wake of a sudden and severe natural disaster and its effect on long-term cooperation. It has been driven by the need to signal a willingness to change behavior in favor of cooperation, or maintain a behavior if the status quo is cooperation.

The first hypothesis tests whether or not there is a relationship between the offering of aid in the wake of a sudden and severe natural disaster and changes in average post-disaster cooperation levels in multiple time frames. These time frames are calculated using a one-year pre-disaster average cooperation level.

Hypothesis 1:

The offering of aid after a sudden and severe natural disaster will result in an increase in the average cooperation level by the afflicted state towards its’ aid offering neighbor when compared to the average twelve month pre-disaster cooperation level.

The second hypothesis delves deeper into the disaster diplomacy literature and investigates if the *level* of disaster assistance that is offered matters to post-disaster cooperation levels. These tests are the best indicator for long-term cooperation because within the disaster

assistance level variable, there is an inherent measurement of the signal's strength. The offering of condolences to the government of an afflicted state is not the same as directly involving a state's resources into the disaster situation. These differences in the assistance levels are a crucial conceptualization of disaster diplomacy and offer the best independent variable for changes in cooperation levels. Based on the importance of these terms in measuring initial cooperation as well as signal strength, I hypothesize the following relationship between the level of disaster-assistance and future cooperation levels.

Hypothesis 2:

An increase in the level of disaster-related assistance offered in the wake of a severe natural disaster will result in greater levels of cooperation by the afflicted state towards its' aid offering neighbors when compared to the average twelve month pre-disaster cooperation level.

In summary, the first hypothesis tests if the mere act of offering aid has an effect on post-disaster relations. The second hypothesis considers the level of assistance offered by a state. Utilizing the TIT-FOR-TAT theoretical argument of cooperation suggested by Axelrod and Keohane, I build a theoretical argument for long-term cooperation based on trust and soft power that supplements the existing framework of disaster diplomacy. This is a logical step in the growth of the disaster diplomacy literature by moving from case-study applications and into a broader measure of the phenomenon in multiple cases over many years. The results provide testable hypotheses for the long-term effects of disaster-assistance as viewed through the lens of an international relations paradigm.

The preceding section has laid out the theoretical arguments and hypotheses that are tested in the thesis. The following chapter focuses on the methodology for testing the aforementioned hypotheses. It includes sections on how the dependent and key independent variables are operationalized. In addition, I lay out the method in which the data was collected

and coded for the statistical analysis of the hypotheses. Finally, the methods section includes a brief explanation of the statistical models that are used for each hypothesis.

CHAPTER 5

METHODS

This project focuses on sudden and severe natural disasters and post-disaster cooperation levels. There have been few attempts to quantitatively measure disaster diplomacy. This has resulted in a dearth of datasets that are appropriate for use in these studies. In the past, researchers who have studied natural disasters and international relations have had to create their own datasets. In order to facilitate future disaster diplomacy studies in general, and specifically its effect on long term cooperation, I combine several existing datasets to create an original dataset which incorporates cooperation levels as well aid and aid level variables from the hypothesis. This new dataset advances the field from the case studies that dominate the current collection of studies towards more large N studies and quantitative analysis.

Framework for Disaster Diplomacy Study

In his 2006 piece, Kelman offers a framework for future research on disaster diplomacy by identifying five characteristics he feels will aid researchers as the field continues to evolve. The characteristics identified are as follows: active vs. passive diplomacy, propinquity of states, aid relationship of the states, level of diplomacy operation and purpose of disaster diplomacy (Kelman 2006: 216-28) Kelman provides a theoretical framework and firmly plants this work within the growing literature on disaster diplomacy. The remaining paragraphs in this subsection introduce unique characteristics and identify where this paper falls within the literature.

The first characteristic relevant for this disaster diplomacy project is propinquity; Kelman suggests three possible categories. In the first category are states that share a physical land border; this is also the first *Correlates of War Direct Contiguity* category. The second category refers to states that are separated by short expanses of water. Once again, Kelman's categories match up with categories found within the separation of states by expanses of water in the *Correlates of War Direct Contiguity*. States that are not in geographic proximity to each other fall into Kelman's last propinquity category. The *Correlates of War Direct Contiguity* and Kelman diverge on this last category because Kelman allows for any state to fall into the group whereas the *Correlates of War Direct Contiguity* water categories extend only to 400 miles. This paper leans more towards the *Correlates of War Direct Contiguity* definitions of propinquity that focuses on land borders and short expanses of water.

The second relevant characteristic of disaster diplomacy is the aid relationship, or, the role in which a state gives or receives aid. As with propinquity, three categories are offered and defined. The first category is mutual aid. This type of aid is found in cases where a state is both an afflicted and an assisting state. The second type of aid is defined as coordinated aid, (part of a multi-state package). The third and final relationship suggested by Kelman captures instances where there is a clear donor-recipient relationship (217). Although all of these categories have the potential for impacting the effect of disaster diplomacy, the main tenet of the thesis argues that easily identifiable disaster-related assistance can be used as a trust and confidence building measure. The study focuses only on cases in which coordinated aid or clear donor-recipient relationships exist.

For the third relevant characteristic of disaster diplomacy, Kelman focuses on the source of the aid. This is an important consideration for behavior signaling. He suggests three possible

levels: governments (Greece, Turkey etc.), NGOs (such as the United Nations) and people-led or grassroots efforts. Kelman acknowledges that the true categorization may not be mutually exclusive and that the response may fall into two or all three groups (217). Although the work of NGOs and people-led disaster diplomacy efforts should be applauded, these categories fall outside the scope of the paper. Instead, the actions that can be traced back to the government level decision making and behavior is used to judge the impact of disaster-related assistance on alterations of long-term cooperation following a severe and sudden natural disaster.

The final and most convoluted characteristic of disaster diplomacy is purpose. The purpose of disaster assistance is often seen in the outcomes and may be positive or negative. To further complicate the issue, one's view of purpose is "often expressed to conform to already-established opinions" (218). For this study, the delivery of disaster-assistance is viewed as having positive purpose with the expected outcome being improved relations over the long-term. Conversely, the absence of disaster assistance is seen as neutral or negative and therefore the expected outcome is the status quo.

Cases:

The unit of analysis for this study is directed dyads consisting of states affected by sudden natural disasters and each potential donor state. Although the prospects of disaster diplomacy could theoretically include any disaster that has occurred, this project focuses on sudden and severe natural disasters. Drury et al. (2005), suggested that the number of people affected is a significant factor in the decision by the United States to assist in a natural disaster. Since the United States is often seen as a leader in the international community, it is logical to expect its behavior to hold true for other states as well. The literature also suggests that severe

disasters can overwhelm states. It is these cases in which a state may be overwhelmed which has the highest potential for disaster relief and behavioral change.

At this time, there are no commonly accepted definitions of “severe” or criteria to determine which disasters may overwhelm a state. This is an important part of the theoretical arguments and thus needs to be defined. I have consulted the United States Census to judge the size and logically link what might overwhelm an emergency management system. The United States Census defines an urbanized area as “(A) densely settled area that has a census population of at least 50,000 people” (Census 2000). Therefore, I define a wind storm, earthquake, wave/tsunami or volcano to be severe if at least 50,000 people are left homeless. Though arbitrary, it allows conceptualization of the size and manner in which a large population in need of immediate assistance may overwhelm an emergency management system.

The identification of such disasters is greatly facilitated by a public-domain dataset available from the World Health Organization and the Centre for Research on the Epidemiology of Disasters. The database, referred to as the Emergency Events Database, or EM-DAT, catalogs various disasters and their impacts around the world. One of the variables that the EM-DAT dataset measures is the number of people left homeless, which is defined as “people needing immediate assistance in the form of shelter.”⁵ For the period between 1992 and 2002, Fifty-five (55) natural disasters in twenty (20) countries fit these criteria. From this base information, several variables outlined in the literature reviews and theoretical argument chapters are combined to form the dataset for this study.

The most relevant characteristic for this study from Kelman’s framework is the distance between the non-afflicted states, or potential donor states, and the afflicted states. These states

⁵ EM-DAT Glossary. <http://www.em-dat.net/glossary.htm#H>

are the focus for international cooperation before and after the sudden and severe natural disaster. The potential donor states are identified according to the *Direct Contiguity Data, 1816-2006*. Version 3.1 (Stinnett et al. 2002). For Continental states, the contiguity relationship includes all states that share a physical land border and states that are separated by up to 24 miles of water. The contiguity type for potential donor states of island nations uses the same criteria but increase the separation of water to 150 miles. This difference in contiguity types is employed to accommodate for the lack of direct contiguity for most island states. This classification combined with the identification of severe natural disaster creates a total of three hundred and twenty-nine (329) potential donor-disaster afflicted state dyads.⁶A list of the disasters and the states investigated for this study is found in Appendix B and C, respectively.

Dependent Variable:

The dependent variable for this study is change in the disaster- afflicted state's behavior toward each potential donor state from pre to post disaster. To test the hypotheses proposed in the previous chapter, change in the average level of cooperative behavior from before to after the disaster event is measured for each afflicted state -> potential donor state directed dyad. For example, following Hurricane Andrew in 1992, the dependent variable measures changes in the average level of cooperative behavior the United States displays toward Canada, Mexico, and Russia.

The dependent variable is created using an ordinal scale for conflict and cooperation. In international relations literature, a standard measurement for international cooperation has been created by Joshua Goldstein. Goldstein (1992) lays out a conflict-cooperation scale for various

⁶ Observations for Democratic Republic of Vietnam were coded as missing in the King data.

events and exchanges between states. The scale has a range from -10 to +8.3. Interstate events are assigned a numeric number on the scale to represent a conflict or cooperative action. Fortunately, Goldstein's event scale has been included with Gary King's (2004) event dataset covering international events from 1990 to 2004.⁷ Gary King's dataset aggregates the positive and negative cumulative sum, as well as the frequency of each category, at the monthly level for the length of the dataset. This dataset serves as the source for the cooperation level measure.

In order to accommodate the long-term effects of these hypotheses, average cooperation levels are calculated for one year before the disaster event and for the following post-disaster time periods: seventh to twelfth month, thirteenth to eighteenth month, thirteenth to twenty-fourth month, and seventh to twenty-fourth month post disaster. These values are created through a series of calculations. The first calculation creates the monthly cooperation level by taking the sum of the positive and negative cumulative Goldstein sum included in the Gary King VRA data. The second step calculates the average cooperation level by adding the monthly values for the appropriate range post-disaster and then dividing the sum by the total monthly duration for the timeframe. The final calculation creates the average change in cooperation levels by subtracting the average cooperation level in a given post-time frame minus the average one year pre-disaster value.

The average change in cooperation from twelve months pre-disaster to seven to twelve months post-disaster has the greatest range of values. The variable's minimum value is -37.49 and the maximum value is 21.26. The mean for this example dependent variable is 0.2085 with a standard deviation of 3.497. The average change in cooperation from twelve months pre-disaster to thirteen to twenty-four months post-disaster has the narrowest range of values. The variable's

⁷ For more information and greater discussion of the data please see King and Lowe (2003).

minimum value is -18.59 and the maximum value is 20.64. The mean is 0.0899 and the standard deviation is 2.590.

Independent Variables:

The key independent variables for each hypothesis are unique to this study and are created to test each hypothesis. The task of creating the variables is accomplished by researching media reports for post-disaster event actions and reactions. Time is a critical part of any disaster assistance. The first days and weeks after a disaster event are crucial for limiting the loss of life and damage caused by the disaster. The hours and days afterward can mean the difference between life and death for the victims. It is during this time frame that behavior changes and signaling by non-afflicted state can improve relationships according to disaster diplomacy. Therefore, this project investigates the first twenty-one days after an event to determine the level of disaster-related assistance offered by a non-afflicted state. This research is accomplished by running multiple Lexis/Nexus searches for each neighboring country, as identified by the Correlates of War direct contiguity dataset, of the afflicted state during a twenty-one day time period after the date established for the disaster by the EM-DAT database. The search includes major United States and World newspapers, news wire services and TV and Radio broadcast transcripts for key terms related to disaster aid, assistance or other related actions. A total of forty-nine (49) instances of disaster related assistance are recorded from this search. These searches form the foundation of the key independent variables in each hypothesis.

The main hypothesis argues that the offering of aid has an effect on future cooperation. This is the basic tenet of disaster diplomacy. Furthermore, the level of aid offered by a country may have an impact on future cooperation levels as well. Glantz (2000) identifies three

categories of disaster assistance; direct involvement, indirect involvement and indirect assistance. This study incorporates two variables, the first variable measuring whether the offering of assistance did or did not occur. The second variable, created using Glantz's categories of assistance, allows for nuances in the change in cooperation based on aid level. Based on the aforementioned Lexis/Nexus searches, the second variable is coded according to Glantz's categories of disaster assistance. In the instances where more than one level was offered, the highest level is recorded. Of the forty-nine instances, eight are coded as indirect assistance, fifteen are indirect involvement and twenty-six are direct involvement.

Control Variables:

In addition to the dependent variable, measured as the average change in cooperation level between the recipient and donor state pre to post disaster, and the key independent variables, measured dichotomously as aid or no aid, and the ordinal aid level using Glantz's categories, this study incorporates two control variables: alliances and diplomatic representation. Conventional wisdom suggests that states that have alliance relationships are friendlier towards each other and this friendly behavior could potentially alter the relationship before and after the natural disaster, skewing the results of disaster related assistance. Alesina and Dollar's (2000) results suggest that this is particularly true in terms of aid flow, thus the incorporation of a variable for alliances seems prudent. In addition, diplomatic representation may also have an impact on state relations. As Kelman's (2006) conclusions suggest, "a disaster can significantly spur on a diplomatic process that had a preexisting basis" (215). This suggests that previous diplomatic representation is an important factor in international relations and changes in

cooperation. Therefore, a variable that captures the diplomatic relationship of the afflicted state to potential assisting state at the time of the disaster is created to control for this relationship.

The control variable for alliance is created using the Correlates of War formal alliance dataset originally composed by Singer and Small (1966a) and updated by Gibler and Sarkees (2004). This dataset covers each dyadic relationship and is aggregated at the yearly level from 1816 to 2000. Alliances are coded as one of three different classes: defense pacts, neutrality or non-aggression treaties, or entente agreements. From this information, two separate variables are created. The first one incorporates the three classes as an ordinal scale variable while the second one is dichotomous, measuring the presence of an alliance between the dyadic partners.

The second control variable being incorporated in the analysis focuses on the dyadic diplomatic representation. Once again, the Correlates of War project provides a dataset from which this variable can be created. The Correlates of War Diplomatic Exchange dataset, updated by Bayer (2006), captures diplomatic representation on an ordinal scale. The three levels are: chargé d'affaires, minister, and ambassador.⁸ During the time frame relevant to this study, the diplomatic representation is coded every five (5) years. Since the data is not available for every year, the previously recorded observation is used as the level at the time of the natural disaster.⁹ In Bayer's (2006) documentation for the diplomatic representation dataset, he states that "(F)ollowing Singer and Small (1973), most scholars are likely to be primarily interested in whether diplomatic representation existed between the two sides rather than at what level." This study is only interested in whether diplomatic representation existed at the time of the disaster.

⁸ For more on the levels and membership in the international system see: Singer and Small (1966b), Small and Singer (1973) and Small (1977)

⁹ The fall of the Soviet Union in 1991 created a handful of cases where the diplomatic level in 1990 was missing. These missing observations are maintained in this study's dataset.

This is also true of the presence of an alliance of any type at the time of the disaster. Both control variables are used in their dichotomous form.

Summary:

In summary, the dependent variables for this study come from Gary King's event dataset covering the years 1990 through 2004 and are calculated using the monthly aggregated Goldstein cooperation levels. Furthermore, the dependent variable is created to cover four time frames; seven and twelve months, thirteen and eighteen months, thirteen and twenty-four months, and seven and twenty-four months post disaster. The change in cooperation levels is calculated by subtracting the average cooperation level in a given post-time frame minus the average one year pre-disaster. The variable calculations create a total of four (4) dependent variables. The key independent variables come from Lexis/Nexis searches and incorporate a dichotomous variable for the offering of aid or no aid offer and another ordinal variable based on the Glantz scale ranging from 0 for no aid offered to 3 for direct involvement aid offered. The results of the statistical tests for these variables are discussed in the following chapter.

CHAPTER 6

RESULTS

The previous chapters have set the stage for a statistical survey of disaster diplomacy and its effects on long-term cooperation. In the sections and tables below, the hypotheses being proposed in the previous section are tested using quantitative statistical models. The key independent variables that are used to test H_1 and H_2 are Aid and Aid Level, respectively. The controls are the dichotomous variables for Alliances and Diplomatic exchange. The co-linearity for the control variables is -0.0221. The Alliance mean is 0.276 and the standard deviation is 0.448. The Diplomatic Exchange mean is 0.822 and the standard deviation is 0.383.

The regression models for the effect of disaster-related aid on changes in average cooperation levels from pre to post disaster indicate statistically significant relationships between the offering of aid and changes in average post-disaster cooperation levels while controlling for the presence of alliances and diplomatic relationships, but the results may not be accurate. Several data points may be influencing the regression line, such as India-Pakistan and the United States-Canada, consequently necessitating testing for heteroskedasticity. Both the White and Breusch/Pagen tests indicate the presence of heteroskedasticity in the models, which leads to inefficiency in OLS regression. To correct for the inconsistency in variance, the models are re-run using robust standard errors. The regressions results using robust standard errors also fail to reject the null hypothesis in all but one case. The table below lists the results from the models runs in Stata 9 to test the hypotheses stated above using robust standard errors to correct for heteroskedasticity.

Table 1: OLS Regression Results for the Effect of Disaster Related Assistance on Post-Disaster Cooperation Using Robust Standard Errors During the Listed Time Frames.

Variables	Change in average cooperation level from twelve months pre-disaster to the seventh through twelfth month post-disaster	Change in average cooperation levels from twelve months Pre-disaster to the seventh through twenty-fourth month Post-disaster	Change in average cooperation levels from twelve months Pre-disaster to the thirteenth through eighteenth month Post-disaster	Change in average cooperation levels from twelve months Pre-disaster to the thirteenth through twenty-fourth month Post-disaster
<i>Aid Offered</i>				
Aid (Offered=1)	1.132 (.867)	1.075 (.616)	.761 (.580)	1.055 (.626)
Alliance	.054 (.480)	-.270 (.426)	-.420 (.401)	-.426 (.510)
Diplomatic Representation	-.308 (.595)	.352 (.524)	-.008 (.476)	.677 (.652)
Constant	.390 (.545)	-.191 (.466)	.351 (.345)	-.489 (.567)
<i>Aid Level</i>				
Aid Level	.519 (.333)	.519* (.248)	.364 (.228)	.522 (.251)
Alliance	.066 (.478)	-.261 (.424)	-.414 (.402)	-.420 (.507)
Diplomatic Representation	-.298 (.595)	.364 (.523)	.001 (.475)	.691 (.650)
Constant	.371 (.543)	-.220 (.463)	.332 (.430)	-.521 (.563)

N: 329

Note: * Statistically significant at the .10 level

Note: Robust Standard Errors in parentheses

Aid level has a statistically significant effect on the average change in cooperation levels during the twelve months pre-disaster to seven to twenty-four months post-disaster time frame,

but the result is not very strong. In this case, the $P > |t|$ is 0.037, but the $\text{Prob} > F$ for the model is 0.0895. This can be interpreted as meaning that a one-unit increase in the level of aid increases the average cooperation level by .519. The $\text{Prob} > F$ value means that the null hypothesis that the model as a whole is not statistically significant can only be rejected with 90% confidence. The model confidence level is unorthodox, but results that were close to being statistically significant while using robust standard errors, lead to a reconsideration of the data.

The failure to produce multiple and strong statistically significant results using OLS regression leads to the generation of a new variable that would record whether the average change in cooperation level during a given time frame is positive, greater than 0, or not. This new variable, based on the old dependent variable, is created by generating a variable with an initial value of 0. For any observations in which the change in the average cooperation level from the twelve months prior to a disaster to a given post-disaster time frame is greater than 0, the new variable value is changed to 1. For example, the average change in the level of cooperation China directed at Afghanistan from the twelve months prior to August 1999 Chinese earthquake to the seven to twelve month post-disaster is .01. The new dependent variable for this observation is recorded as a 1, to represent a positive change in the “average cooperation level” during the stated time period. During the same example time frame, the change in the average cooperation level the Philippines directed towards Indonesia is -.03. In this case, the newly generated dependent variable’s value is 0.¹⁰

The new dependent variables do not include the size of the change, only the direction of the change. That is, whether the change was positive or not. This coding of the dependent

¹⁰ Observations with an “average change in cooperation” value of zero were not recoded with a value of 1. They maintained a value of zero.

variable creates binary variables, and thus logistical regression is appropriate. The results of these models using these new dependent variables are listed in the tables below.

Unlike the OLS model, the Logistical regressions produce statistically significant results at the 95% confidence level for all the time frames. The following tables display the results of the logistical regressions for the dependent variables calculated twelve months pre-disaster. A corresponding interpretation of the tables follows.

Table 2: Logistical Regression Results for the Effect of Disaster-Related Aid on Positive Change in Average Cooperation During a Given Time Frame (Aid =1)

Variables	Positive average change in cooperation levels from twelve months Pre-disaster to the seventh through twelfth month Post-disaster	Change in average cooperation levels from twelve months Pre-disaster to the seventh through twenty-fourth month Post-disaster	Change in average cooperation levels from twelve months Pre-disaster to the thirteenth through eighteenth month Post-disaster	Change in average cooperation levels from twelve months Pre-disaster to the thirteenth through twenty-fourth month Post-disaster
<i>Aid Offered</i>				
Aid	.674** (.343) [96.2%]	.853** (.356) [134.7%]	.782** (.346) [118.%]	1.001** (.354) [173.6%]
Alliance	-.183 (.252) [-16.7]	-.499** (.254) [-39.3]	-.208 (.253) [-18.8%]	-.260 (.255) [-22.9%]
Diplomatic Representation	.696** (.301) [100.5%]	.892** (.302) [143.9%]	.721** (.302) [105.7%]	.776** (.305) [117.2%]
Constant	-.863** (.288)	-.743** (.287)	-.878** (.289)	-.911** (.292)
Prob > Chi2	0.0273	0.0006	0.0129	0.0021
Log Likelihood	-220.65138	-219.32459	-220.08547	-218.59022
Count R2	0.584	0.605	0.587	0.587
Adj Count R2	0.042	0.188	0.056	0.068
N	329	329	329	329

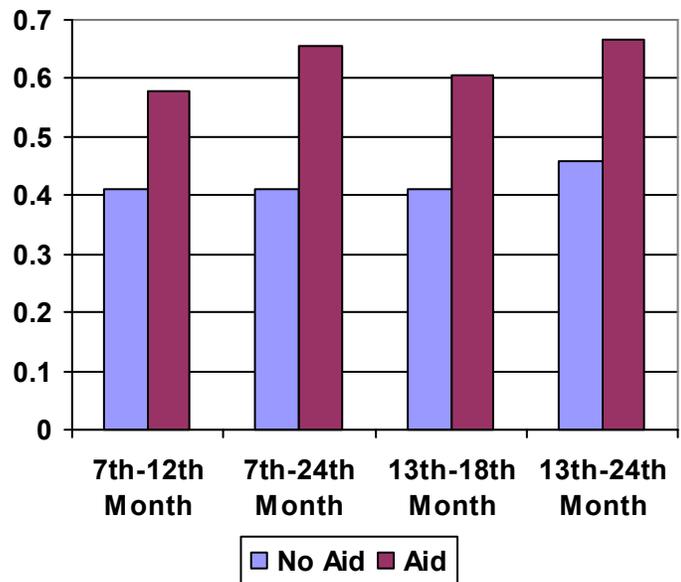
Note: ** Statistically Significant at the .05 level

Note: Standard Errors in parentheses

Note: Percent Change of Odds in brackets

The probability of a positive change in the average cooperation level between twelve months pre-disaster to all four post-disaster time frames are statistically significant at the .05 level. This indicates that there is a relationship between the offering of aid and positive changes in the average post-disaster cooperation level. For illustrative purposes, I interpret these results for the first time frame, twelve months pre-disaster and the seven to twelve month post-disaster. Because logit is linear in the odds ratio, the coefficient can be interpreted as indicating that an offer of disaster-related aid increases the odds of a positive change in the average cooperation levels by 96.2%. This is a decent increase in the odds of positive change. The model correctly predicts 58.4% of the cases. These results represent an increase over guessing the model category alone, the proportional reduction in error, of 4.2%. The reduction is very modest during the time frame interpreted, but the reduction increases across the other models and reaches a high of 18.8%.

Figure 1: Effect of Aid on Predicted Probability for Positive Change in Average Cooperation



Note: Alliance and Diplomatic Exchange held constant at mean values.

The predicted probabilities for the effect of aid for positive change in average cooperation help illustrate the role aid plays on future average cooperation levels when holding the control values at their means. Figure 1 above visually shows how the offering of disaster-related assistance increases the probability of a positive average change during a given time frame. In all of the cases above, the difference between the predicted probabilities for no aid and aid are greater than .15. In addition, the graph shows that in all four time frames, the predicted probability of a positive average change in cooperation levels is less than .50 when no aid is given. The results are reversed, with all time frames showing a greater than .50 probability, when aid is offered.

The results of the models presented above suggest some evidence in support of H_1 . The offering of disaster-related assistance after a sudden and severe natural disaster has a statistically significant effect on the probability of a positive change in cooperation. Furthermore, the predicted probabilities, holding the control variables at their means, offer further evidence that the offering of aid increases the probability of a positive change in cooperation. This effect is meaningful because the predicted probabilities suggest that the offering of aid will improve the odds of a positive change in average cooperation over the 50/50 mark.

The previous results suggest that aid does, in fact, have an effect on the post-disaster cooperation levels. These results are promising and suggest that more nuanced variables, which capture the aid level, might have a bigger effect on the post-disaster cooperation levels. The following tables represent the models run to test the second hypothesis; that the aid level is important in changing post-disaster cooperation levels after aid has been offered in the wake of a severe and sudden natural disaster.

Table 3: Logistical Regression Results for the Effect of Disaster-Related Aid Level on the Positive Average Change in Cooperation Levels During a Given Time Frame

Variables	Positive average change in cooperation levels from twelve months Pre-disaster to the seventh through twelfth month Post-disaster	Change in average cooperation levels from twelve months Pre-disaster to the seventh through twenty-fourth month Post-disaster	Change in average cooperation levels from twelve months Pre-disaster to the thirteenth through eighteenth month Post-disaster	Change in average cooperation levels from twelve months Pre-disaster to the thirteenth through twenty-fourth month Post-disaster
<i>Aid Level</i>				
Aid Level	.254* (.140) [28.9%]	.343** (.147) [40.9%]	.250* (.140) [28.4%]	.427** (.148) [53.2%]
Alliance	-.169 (.251) [-15.5%]	-.483* (.254) [-38.3%]	-.186 (.251) [-16.9%]	-.244 (.254) [-21.7%]
Diplomatic Representation	.692** (.301) [99.7%]	.890** (.302) [143.6%]	.706** (.300) [102.6%]	.780** (.306) [118.2%]
Constant	-.853** (.287)	-.738** (.287)	-.846** (.287)	-.915** (.292)
Prob > Chi2	0.0354	0.0007	0.0322	0.0016
Log Likelihood	-220.93679	-219.43415	-220.08547	-218.33417
Count R2	0.590	0.611	0.581	0.593
Adj Count R2	0.056	0.200	0.042	0.082
N	329	329	329	329

Note: * Statistically Significant at the .10 level

Note: ** Statistically Significant at the .05 level

Note: Standard Errors in parentheses

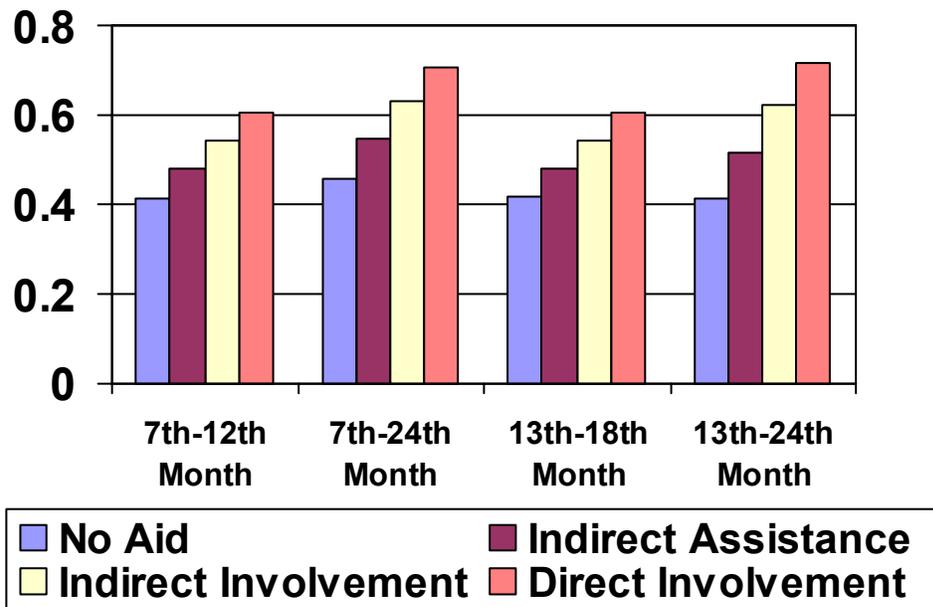
Note: Percent Change of Odds in brackets

Note: LR test failed to reject the null hypothesis

The probability of a positive change in the average cooperation level twelve months pre-disaster and at all four post-disaster time frames are statistically significant at the .10 level or better. The results are split between two accepted levels of significances. The seven to twenty-four month and thirteen to twenty-four month post-disaster time frames are statistically significant at the .05 level while the other two time frames are significant at the .10 level. This indicates that there is

a relationship between the level of aid offered and positive changes in the average post-disaster cooperation level. For illustrative purposes, I interpret these results for the first time frame, from twelve months pre-disaster to seven to twelve months post-disaster, like I did for the offering of aid. The odds ratio coefficient can be interpreted as indicating that as the level of disaster-related aid increases, the odds of a positive change in the average cooperation levels increases by 28.9%. This is a respectable increase in the odds of positive change. The model represents an increase over guessing the model category alone, the proportional reduction in error, of 5.6%. The reduction is modest during the time frame interpreted, but the proportional reduction in error increases across the other models and reaches a high of 20.0%.

Figure 2: Effect of Aid Level on Predicted Probability for Positive Change in Average Cooperation



Note: Alliance and Diplomatic Exchange held constant at mean values.

The predicted probabilities for the effect of the disaster-related aid level on positive change in average cooperation help illustrate the role aid plays on future average cooperation

levels when holding the control values at their means. The graph above visually shows that as the level of aid increases, so too does the probability of a positive average change during a given time frame. In all of the cases above, involvement, indirect or direct, results in a predicted probability greater than .50. In addition, the graph shows that in all four time frames, the predicted probability of a positive average change in cooperation levels is greatest when the highest level of aid type is offered.

The results of the models and predicted probabilities presented above suggests some evidence in support of H₂ that an increase in the level of disaster-related assistance offered in the wake of a severe natural disaster will result in greater levels of cooperation between the afflicted and donor state. In all cases, the Aid Level has a statistically significant effect on the probability of a positive change in cooperation. Furthermore, the predicted probabilities offer further evidence that as the aid level increases, so too does the probability of a positive change in cooperation.

In summary, the OLS regression models produce only one case with statistically significant results for the effect of extending disaster-related assistance on the average post-disaster cooperation level after robust standard errors are used to correct for heteroskedasticity. To further test the hypotheses and address influential outliers, new dependent variables are created to determine if there is a positive change in the average post-disaster cooperation level. A logistical regression test produces statistically significant results for all of the models in which aid was the key independent variable. The predicted probabilities for these models present further evidence that the change is in the hypothesized direction. The Aid Level variable also produces statistically significant results. These results suggest that an increase in the level of aid

does increase the probability of a positive change in cooperation levels. The table below summarizes the levels of statistical significance for the logistical regressions.

Table 4: Summary of Aid and Aid Level Models

Time Frame	Positive average change in cooperation levels from twelve months Pre-disaster to the seventh through twelfth month Post-disaster	Positive average change in cooperation levels from twelve months Pre-disaster to the seventh through twenty-fourth month Post-Disaster	Positive average change in cooperation levels from twelve months Pre-disaster to the thirteenth through eighteenth month Post-disaster	Positive average change in cooperation levels from twelve months Pre-disaster to the thirteenth through twenty-fourth month Post-disaster
Aid	.674** (.343) [96.2%]	.853** (.356) [134.7%]	.782** (.346) [118.%]	1.001** (.354) [173.6%]
Aid Level	.254* (.140) [28.9%]	.343** (.147) [40.9%]	.250* (.140) [28.4%]	.427** (.148) [53.2%]

Note: * Statistically Significant at the .10 level
 Note: ** Statistically Significant at the .05 level
 Note: Standard Errors in parentheses
 Note: Percent Change of Odds in brackets

CHAPTER 7

CONCLUSIONS

Following the Asia Tsunami in 2005, and the Kashmir Earthquake in 2006, many people openly questioned the long-term effects of the disaster and if there was a silver lining in the events that transpired. One of the promising answers to these questions comes from a growing number of cases studies and anecdotal evidence of a phenomenon that has been termed disaster diplomacy. This phenomenon is potentially significant for international relations scholarship if there is, in fact, a change in state behavior following the offer of assistance in the wake of a severe natural disaster.

This project focuses on the prospect for change in average cooperation levels over the long-term based on neighboring countries' decisions to offer aid when one of its' neighbors are afflicted by a sudden and severe natural disaster. The variable serves as the dependent variable for the study and was calculated by subtracting the average cooperation level in a given post-time frame minus the average one year pre-disaster. By casting a wide net for possible cases and multiple observations in line with Kelman's framework, this project succeeds in gathering sufficient observations, 294 observations per time period, to statistically test potential hypotheses derived from a disaster diplomacy and liberalism literature.

In addition, two key independent variables are created using criteria suggested by Glantz (2000) and collected after a Lexis/Nexis search in major United States and World newspapers, news wire services and TV and Radio broadcast transcripts for key terms related to disaster aid, assistance or other related actions. These key independent variables are used to test the effect of

aid or aid level on average cooperation levels in the wake of a severe natural disaster. Two control variables for the presence of an alliance and diplomatic representation are also included in the statistical analysis.

The theoretical background for the disaster diplomacy part of the project is aided by Ilan Kelman's 2006 work and framework. Although Kelman's work is invaluable for the framing of this study, the small collection of disaster diplomacy literature lacks an international relations theoretical background and is limited to case studies. The goal of this project is to combine the disaster diplomacy literature with a prominent international relations paradigm and expand the cases study to allow for a large N statistical study of the phenomenon.

Axelrod and Keohane's works on cooperation form the basis for the theoretical argument and hypotheses as they relate to international relations literature. These works include the famous Tit-For-Tat strategy from Keohane's work and their observations on the shadow of the future and reciprocity. Joseph Nye's soft power argument also supplements the theoretical sections to ground the project in international relations scholarship on interstate cooperation. Kelman (2006), Glantz (2000) and Comfort (2000) provide additional details and criteria for disaster diplomacy studies.

The OLS regression results do not produce any statistically significant results for a relationship between disaster-related assistance and changes in average long-term cooperation levels. The failure of the OLS regression to provide statistically significant results means that the level of change cannot be calculated. Although these results are disappointing, the logistical regression analyst does provide an avenue for future study.

The statistically significant results for a positive change in average cooperation levels suggests that there is, in fact, a relationship between disaster assistance and changes in average

cooperation levels. The results of the logistical regression also provide some guidance for policy makers. Aid and Aid Level do affect the probability of a change in cooperation levels in a positive manner. The offering of aid shows the greatest probability of positive average change in cooperation for the seventh to twenty-fourth month post-disaster time period. The predicted probability for this analysis is .6648 and the percent change in odds for a positive average change increases by 134.7% while correctly predicting 60.5% of cases over guessing the model category alone, an improvement of 18.8%. These results are statistically significant at the 95% confidence level.

Furthermore, the predicted probabilities suggest that increases in the level of aid will increase the predicted probability of a positive change in cooperation levels. Unlike the results that group all types of aid into one category, the analysis for aid level is more nuanced and takes into consideration the Glantz (2000) aid level criteria. The level of aid offered for the thirteenth to twenty-fourth has the greatest effect on the probability of a positive change in average cooperation levels. The model for this time period improves the odds of a positive change in average cooperation level by 53.2% and correctly predicts 59.3% of the cases, an improvement of 8.2% over guessing the model category alone. The predicted probability also reaches a study high for the highest level of aid offered. When aid categorized as direct involvement occurs, the predicted probability for a positive change in average cooperation is .7045.

Policy makers should take note that the greatest impact for the offer of aid in the wake of a severe natural disaster does not become apparent until at least one year after the disaster. Although the seventh to twelfth month post-disaster time frame produces statistical significant results, the results are the lowest of the four time frames tested. This is true for generic offering of aid and the more specific aid level variables. In addition, diplomatic representation proves to

be an important consideration when looking at disaster-related assistance and post-disaster cooperation. The results appears to be in line with Kelman's initial statement that "(D)isaster-related activities can catalyze, but do not create, cooperation" (Kelman 2006: 215).

The most important result from this study is the effect of aid on the predicted probabilities. When aid is offered following a severe and sudden natural disaster, the predicted probability of a positive average change in cooperation increases to over .50 or 50%. In fact, the predicted probabilities reverse themselves; from a 3:2 ratio predicting no positive change in average cooperation level when no aid is given, to a 3:2 or better ratio predicting a positive average change in cooperation levels when aid is offered.

The predicted probabilities for aid level also tell an important story. In all of the time frames tested, involvement, direct or indirect, proves to be the necessary level of assistance to cross the 50% predicted probability threshold. Although the predicted probabilities for the instances of indirect assistance did cross the 50% threshold during the time frames that test the full second year, 13th – 24th month and 7th – 24th month post-disaster, the predicted probabilities for the higher aid levels increase to much higher levels, with the direct involvement level reaching the greatest predicted probability for a positive change in average cooperation levels.

Although the results of this study suggest that disaster-related assistance can improve the probability of improved relations post-disaster, there is also a cautionary tale. For the most part, very few of the disasters that are identified by the selection criteria garnered significant media attention. Of the disasters that did garner media attention, the number of disasters that triggered an international response was small. This suggests that international aid is not always needed and should not be offered at each and every natural disaster. It is also possible that a high frequency of assistance offers by a neighboring state could be perceived as meddling in the afflicted states

internal affairs and can weaken the afflicted state's government. Future research may help clarify this potential side effect.

It has been the hope throughout this project to provide future research a stepping stone for research into disaster diplomacy. The results provide promise and suggest that additional research is warranted in the field. Although this project, and potentially other projects, is limited by the cooperation data readily available, possible research directions could revise the selection criteria to further hone the type of disaster event and their aftermath in which disaster diplomacy could occur. Additional studies could focus on regional aspects of the disasters to determine if the frequency of natural disasters has a diminishing effect on the prospects for disaster diplomacy. This project is but a small addition to the growing disaster diplomacy literature, but the results suggest that there is, in fact, potential for improved long-term relations in the wake of a sudden and severe natural disaster.

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Appendix A

Goldstein Scale Conflict-Cooperation Scale

Event Type	Weight	SD
223 Military attack; clash; assault	-10.0	0.0
211 Seize Position or possession	-9.2	0.7
222 Nonmilitary destruction/injury	-8.7	0.5
221 Noninjury destructive action	-8.3	0.6
182 Armed force mobilization, exercise, display; military buildup	-7.6	1.2
195 Break diplomatic relations	-7.0	1.3
173 Threat with force specified	-7.0	1.1
174 Ultimatum; threat with negative sanction and time limit	-6.9	1.4
172 Threat with specific negative nonmilitary sanction	-5.8	1.9
193 Reduce or cut off aid or assistance; act to punish/deprive	-5.6	1.4
181 Nonmilitary demonstration, walk out on	-5.2	2.1
201 Order person or personnel out of country	-5.0	1.7
202 Expel organization or group	-4.9	1.4
150 Issue order or command, insist, demand compliance	-4.9	1.7
171 Threat without specific negative sanction stated	-4.4	1.5
212 Detain or arrest person(s)	-4.4	2.3
192 Reduce routine international activity; recall officials	-4.1	1.2
112 Refuse; oppose; refuse to allow	-4.0	1.5
111 Turn down proposal; reject protest, demand, threat	-4.0	1.5
194 Halt negotiation	-3.8	0.9
122 Denounce; denigrate; abuse	-3.4	1.1
160 Give warning	-3.0	1.3
132 Issue formal complaint or protest	-2.4	0.9
121 Charge; criticize; blame; disapprove	-2.2	1.3
191 Cancel or postpone planned event	-2.2	1.5
131 Make complaint (not formal)	-1.9	0.6
063 Grant asylum	-1.1	2.5
142 Deny an attributed policy, action, role or position	-1.1	1.0
141 Deny an accusation	-0.9	1.3
023 Comment on situation	-0.2	0.5
102 Urge or suggest action or policy	-0.1	1.5
021 Explicit decline to comment	-0.1	0.6
094 Request action; call for	-0.1	1.0
025 Explain or state policy; state future position	0.0	0.0
091 Ask for information	0.1	0.4
011 Surrender, yield to order, submit to arrest	0.6	7.2
012 Yield position; retreat; evacuate	0.6	6.6
031 Meet with; send note	1.0	0.9
095 Entreat; plead; appeal to; beg	1.2	1.8
101 Offer proposal	1.5	1.9
061 Express regret; apologize	1.8	1.5
032 Visit; go to	1.9	2.4
066 Release and/or return persons or property	1.9	2.7
013 Admit wrongdoing; apologize, retract statement	2.0	2.2
062 Give state invitation	2.5	2.7
054 Assure; reassure	2.8	2.2
033 Receive visit; host	2.8	3.0
065 Suspend sanctions; end punishment; call truce	2.9	3.6
082 Agree to future action or procedure, to meet or to negotiate	3.0	2.5
092 Ask for policy assistance	3.4	1.1
093 Ask for material assistance	3.4	2.4
041 Praise, hail, applaud, extend condolences	3.4	2.1
042 Endorse other's policy or position; give verbal support	3.6	1.8
053 Promise other future support	4.5	1.6
051 Promise own policy support	4.5	1.7

052 Promise material support	5.2	1.5
064 Grant privilege; diplomatic recognition; de facto relations	5.4	1.4
073 Give other assistance	6.5	1.9
081 Make substantive agreement	6.5	1.4
071 Extend economic aid; give, buy, sell, loan, borrow	7.4	1.0
072 Extend military assistance	8.3	0.9

NOTE: Weight is mean of weights assigned by eight panelists; *SD* is standard deviation across panelists.

From: Goldstein, Joshua S. 1992. "A Conflict-Cooperation Scale for WIES Events Data."
Journal of Conflict Resolution 36 (2): pg 376-377

Appendix B

Natural Disasters

Typhoon/Cyclone/Hurricane/Windstorms

August 1992 – China
August 1992 – United States
February 1993 – Bangladesh
February 1993 – Philippines
April 1993 – China
December 1993 – India
December 1993 – Philippines
March 1994 – Mozambique
April 1994 – Philippines
May 1994 – Bangladesh
June 1994 – China
August 1994 – China
April 1995 – Bangladesh
May 1995 – Bangladesh
November 1994 – Haiti
August 1995 – Laos
October 1995 – Philippines
November 1995 – China
October 1996 – Cuba
May 1997 – Bangladesh
June 1997 – China
October 1997 – Mexico
May 1998 – China
September 1998 – Dominican Republic
December 1998 – Philippines
March 1999 – Bangladesh
May 1999 – Pakistan
August 1999 – China
October 1999 – India
July 2000 – Philippines¹¹
July 2000 – Philippines¹²
September 2000 – North Korea
October 2000 – Philippines
February 2001 – Philippines
June 2001 – China

Earthquake

March 1992 – Turkey
December 1992 – Indonesia
January 1995 – Japan
February 1996 – China
January 1997 – China
April 1997 – China
June 1998 – Turkey
January 1999 – Colombia
March 1999 – India
August 1999 – Turkey
September 1999 – Taiwan
November 1999 – Turkey
January 2000 – China
May 2000 – Indonesia
August 2000 – China
January 2001 – India
February 2001 – China
June 2001 – Peru

Volcano

February 1993 – Philippines
January 2002 – Zaire

¹¹ July 5

¹² July 7

Appendix C

Potentially Assisting State Dyads

<u>Bangladesh</u>	<u>Dominican</u>	<u>Laos</u>	<u>Philippines</u>
India	<u>Republic</u>	Cambodia	Indonesia
Myanmar	Haiti	China	Malaysia
(Burma)	Bahamas	Myanmar	Taiwan
		(Burma)	
<u>China</u>	<u>Haiti</u>	Thailand	<u>Taiwan</u>
Afghanistan	Bahamas	Vietnam	China
Bhutan	Cuba		Japan
India	Dominican		Philippines
Kazakhstan	Republic	<u>Mexico</u>	
Kyrgyzstan	Jamaica	Belize	
Laos		Guatemala	<u>Turkey</u>
Mongolia	<u>India</u>	United States	Armenia
Myanmar	Bangladesh		Azerbaijan
(Burma)	Bhutan	<u>Mozambique</u>	Bulgaria
Nepal	China	Malawi	Cyprus
North Korea	Myanmar	Swaziland	Greece
Pakistan	(Burma)	South Africa	Georgia
Russia	Nepal	Tanzania	Iran
Taiwan	Pakistan	Zimbabwe	Iraq
Tajikistan	Sri Lanka	Zambia	Syria
Vietnam			
	<u>Indonesia</u>	<u>North Korea</u>	<u>United States</u>
<u>Colombia</u>	Australia	China	Canada
Brazil	India	South Korea	Mexico
Ecuador	Malaysia	Russia	Russia
Panama	Paula (after 1994)		
Peru	Papua New	<u>Pakistan</u>	<u>Zaire</u>
Venezuela	Guinea	Afghanistan	Angola
	Philippines	China	Burundi
<u>Cuba</u>	Singapore	India	Central African
Bahamas	Thailand	Iran	Republic
Haiti		Myanmar	Congo
Jamaica	<u>Japan</u>	(Burma)	Rwanda
Mexico	North Korea		Sudan
United States	Russia	<u>Peru</u>	Tanzania
	South Korea	Bolivia	Uganda
	Taiwan	Brazil	Zambia
		Chile	
		Colombia	
		Ecuador	