

Disaster Recovery as Translational Applied Sociology: Transforming Chronic Community Distress

J. Steven Picou, Ph.D.
Universtiy of South Alabama

Abstract: *The chronic social impacts of disasters will increasingly plague communities, families and individuals in the twenty-first century. Programs for mitigating chronic impacts are non-existent. This article describes the implementation of a translational, applied intervention strategy for survivors of the largest and most ecologically destructive technological disaster in the history of North America – the Exxon Valdez oil spill. The translational character of the program allowed for maximum “return flows” from residents of the target community and the “invention” and application of innovative program components. Evaluation data suggest that the program was relatively successful and the development of portable translational tools have allowed for continuous applications to other communities impacted by disasters over the last decade.*

Introduction

The last thirty years has witnessed a dramatic increase in major disasters throughout the world. A variety of natural, technological, natech and terrorist events has resulted in the displacement of millions of people, hundreds of thousands of deaths, and severe mental and physical health consequences that will plague survivors for decades. Numerous sociologists have argued that the traditional social risk paradigm has shifted and the survival of human communities will be seriously challenged in the twenty-first century by new and unpredictable worst-case catastrophes (Beck 1992; 2007; Clarke 2006; Picou and Marshall 2007; Marshall and Picou 2008; Williams 2008). This changing risk landscape has

been acknowledged and recognized by American Sociology for over 25 years (for example, see Short 1984). However, the implications of this trend for “public” and “applied” sociology has received relatively little attention from disaster researchers, environmental sociologists and applied sociologists (Picou, 2008a).

In the mid 1970’s, Erikson’s seminal study of the survivors of a dam collapse and raging flood in Buffalo Creek, West Virginia revealed an “anomaly” in the traditional structural-functional model of disaster recovery (Erikson 1976a; Brunsmas and Picou 2008). Survivors of this horrific disaster were found to be immersed in a culture of “collective trauma” that precluded any resemblance to the pre-disaster community. The social fabric of Buffalo Creek was literally shredded and severe mental health impacts resulted in self-isolation and personal estrangement for many survivors, for example, the loss of “communality” (Erikson 1976b; 1994). The lack of timely social and psychological recovery for survivors further verified that this disaster posed new questions for the traditional model of disaster recovery (Green et al. 1990). This observed “anomaly” slowly shifted the disaster research paradigm from a “consensus model” to a more “interactionist-conflict model”, and numerous studies of toxic technological disasters soon provided empirical support and conceptual refinements to Erikson’s seminal observations (Edelstein 1988; Kroll-Smith and Couch 1993a; Freudenburg 1997; Picou et al. 2004).

Over the last 25 years, studies of a variety of disastrous events, including underground mine fires, contaminated communities, radiation releases, toxic train derailments and oil spills, have cumulatively revealed the nature, contours and depth of this “new species of trouble” for survivors of human induced catastrophic events (Edelstein 1988; Kroll-Smith and Couch 1991; Gill and Picou 1991; Picou et al. 1992; Baum and Fleming 1993; Erikson, 1994; Picou and

Gill 1996; Freudenburg 1997; Norris et al. 2001; Picou et al. 2004). Indeed, this line of research resulted in a period of reflection by sociologists on just what a “disaster” was, and several books and articles emerged that generated a discourse on the utility of distinguishing the etiological origins of the disaster event, for example, whether they originate in “nature” or are caused by toxic contamination, human failure, and technological malfunctions (Kroll-Smith and Couch 1991; Freudenburg 1997; Quarantelli 1987; 1998; Perry and Quarantelli 2005; Quarantelli et al. 2006).

This analytical discourse has been beneficial to disaster sociologists who subsequently have retraced their historical roots, refocused research to include the study of hazards, conceptualized issues such as community vulnerability and resiliency, altered approaches to emergency management, integrated the phenomena of terrorism as a form of disaster, and provided new conceptual models for understanding the complex and intricate manner that modern catastrophes impact people and human communities (Webb 2002; Marshall et al. 2003; Waugh 2006; Quarantelli et al. 2006; Gunter and Kroll-Smith 2007). However, and most important, the challenge of applying sociological theories and principles for mitigating the chronic impacts experienced by survivors of modern catastrophic disasters has received considerably less attention in the sociological literature. One reason for this situation is that traditional models of natural disaster impacts have focused on social systems, stage models of disaster life cycles, organizational response, and relatively short-term adjustments for restoring system functions (Picou and Marshall 2007). The application of sociological principles for disaster recovery requires an alternative framework that engages different units of analysis. In short, an interactionist framework that focuses on survivors, their families and communities is necessary for translating research knowledge to survivors, partnering

with local community organizations, establish equal-status “return flows” from survivors and ultimately recasting corrosive social cycles to therapeutic social cycles.

Objectives

In this article I suggest that it is imperative for disaster researchers and environmental sociologists to engage in the application of sociological concepts and principles for building community resiliency and facilitating the creation of participatory “social inventions” that mitigate the chronic forms of collective trauma that characterize survivors of modern catastrophes (Whyte 1991). Using conceptual refinements, such as the “corrosive community,” “corrosive social cycles”, and “therapeutic social cycles”, I describe one translational application that provided a roadmap for mitigating the social and psychological impacts of a major technological disaster – the *Exxon Valdez* oil spill (EVOS). This translational “invention” used sociological research findings to create participatory social networks for transforming the social roles of survivors from “disaster victim” to “active participant,” mapping a proactive process for community recovery (Hillsman 2003). The EVOS translational intervention was implemented from 1995-1997. However, through the development of original translational tools, primarily in the form of peer-listener training DVD’s, mitigation activities have continued to the present. This exemplar for translational sociology was based on three generic principles of symbolic interaction theory: communication; action; and participation (Blumer 1969; Whyte 1991; Maines 1997). Furthermore, “return flows,” the equal-status participation of community residents regarding the content, design and implementation of the intervention, occurred during all phases of the program and continue to the present (Krause, this volume).

I use both qualitative and quantitative data from this

intervention for describing the diagnostic, prescriptive and translational activities that occurred between researchers and community residents. This interactionist program produced a pattern of “altercasting” that facilitated personal and community recovery for survivors (Wendt 1992). Multiple interactionist strategies, or social inventions, will be described, including educational outreach strategies, peer-listener training, and Alaska Native Talking Circles. In the long-standing tradition of translational sociology, this project initially used basic research findings to address serious social and mental health problems resulting from the EVOS in the community of Cordova, Alaska. This project also incorporated a participatory action research model which allowed for continuous interaction between researchers and community residents (Whyte 1991). These activities translated meaningful role-making behaviors of residents for facilitating patterns of community recovery by rebuilding social relationships and empowering individuals, groups, and organizations. In addition, translational tools were developed in the form of training DVD’s which were produced that added a portable dimension to rebuilding corrosive social relationships. Furthermore, a comprehensive guidebook was developed from all project materials and serves as a reference for all communities experiencing disaster-related collective trauma (www.pwsrcac.org/projects/osrplan/coping.html).¹ The original DVD training program was produced in 2001 and was updated in 2008 (PWSRCAC: Peer Listener Training Program DVD Video 2001).²

The Problem: Contamination, Institutional Response and Community Corrosion

Human communities exist in “ecological fields,” or “networks,” structured by an adaptive division of labor that connects interdependent social units and their “socially-constructed” relationship to the biophysical environment

(Kroll-Smith and Couch 1991; 1993a; 1993b; Bates and Penlanda 1994; Oliver-Smith 1998). Communities are not simply autonomous social systems existing separately from their biophysical environment. Indeed, complex technological systems in the modern world create hazards and introduce numerous involuntary risks to human communities (Perrow 1984; Beck 1992; 2007). Depending on the nature of a community's relationship to the biophysical environment, technological hazards and risks become potential sources of community vulnerability to disasters and contamination.

Sociologists have traditionally conceptualized disasters as "social crisis situations" which "include environmental, technological, and sociopolitical events" (Kreps 1995:260; Quarantelli 1995). Recent sociological reviews of the concept of disaster have focused on the interrelated economic, social and psychological impacts of such events on communities, organizations, families, and individuals (Baum 1987; Baum and Fleming 1993; Dynes 1993; Erikson 1994; Quarantelli 1987; 1998; Freudenburg 1997). Understanding the complex social impacts of modern catastrophic events requires an ecological-symbolic framework that articulates the interactive relationship between human communities and their biophysical environment (Kroll-Smith and Couch 1991, 1993; Gunter and Kroll-Smith 2007). This ecological-symbolic perspective posits "that communities are linked through exchange relationships with their built, modified and biophysical environments; and disruptions in the ordered relationships between communities and environments are locally interpreted and responded to as hazards and disasters" (Kroll-Smith and Couch 1991:6-7). Humans experience the biophysical environment and their social constructions of culture, social organization, and tradition emerge from that experience. This intimate ecological-social relationship includes linkages between and within social units that also incorporate various social

constructions of “nature” (Peacock 1991; Bates and Pelanda 1994; Oliver-Smith 1998; Marshall et al. 2005).

These ecologically contextualized social relationships establish levels of community vulnerability based on culture, social organization and the potential to adapt to an “extreme biophysical environment” (Kroll-Smith et al. 1997). Disasters can strain or even “break” the links between communities and their historically conditioned sociocultural relationships to the biophysical environment (Kroll-Smith and Couch 1991). In sum, toxic contamination of the biophysical environment has direct social consequences in that both ecological and sociocultural systems are challenged by an alternative poisoned ecology (Marshall et al. 2005).

Most recently, sociologists have focused on attempts to classify disasters in terms of various typologies. Some disaster researchers have argued that the “triggering agent” and biophysical environment are irrelevant for understanding social impacts, since it is only the community response that defines and constructs any disaster (Dynes 1993; Quarantelli 1987; 1998). However, a preponderance of recent studies have documented that when disasters occur because of anthropogenic failure, often resulting in the contamination of natural, modified and built environments, a conflict-prone “definition of the situation” emerges which has long-term community impacts that last for decades (Edelstein 1988; Erikson 1976; 1994; Freudenburg 1997; Baum and Fleming 1993; Gill 1994; Green 1996; Picou and Gill 1996; Gill and Picou 1999; Picou et al. 2004). Furthermore, studies that have compared “natural disaster” impacts to “technological disaster” impacts clearly reveal more severe, long-term social consequences for survivors of human-caused catastrophes (Tierney and Baisden 1979; Cuthbertson and Nigg 1987; Norris et al. 2001).

A disaster typology developed by Erikson (1994) is informative for our understanding of this difference and is

graphically presented in Figure 1. This typology employs a property space that classifies disasters in terms of the cause of the event and the level of toxicity. This classification distinguishes between “natural” and “technological” disasters, as well as identifying “technological accidents” and “natural toxic releases” as alternative types of threatening events. From Figure 1, it is apparent that the EVOS was a toxic technological disaster since it severely threatened the biophysical resources of Prince William Sound, as well as the ecologically contextualized culture, lifestyles, and economy of residents of local fishing communities and Alaska Native villages.

Figure 1: Erikson’s Disaster Typology*

Level of Toxicity	Human (Technological)	Nature (Natural)
Non-Toxic	e.g., fires, dam collapse, airplane crashes, explosions	e.g., hurricanes, floods, tornadoes, earthquakes
Toxic	e.g., oil spills, toxic chemical spills, radiation leaks, toxic waste contamination	e.g., radon gas, na-tech scenarios

*Erikson 1994

Toxic technological disasters generate a human response that is characterized by anger, uncertainty, loss of institutional trust, collective stress, self-isolation and litigation (Edelstein 1988; Erikson 1994; Freudenburg 1997; Arata et al. 2000; Picou et al. 2004; Gunter and Kroll-Smith 2007). This response pattern was not common among victims of traditional twentieth-century natural disasters, where typically, the emergence of a therapeutic community occurred in a timely fashion (Freudenburg 1997). One of the reasons for this anomalous pattern of response relates to the fact that technological disasters are perceived to be preventable, whereas natural disasters are

viewed as beyond human control and are often predictable. In fact, the very lack of a therapeutic community response to technological disasters facilitates chronic social impacts through the evolution of “corrosive communities,” and more specifically, “corrosive social cycles” (Freudenburg and Jones 1991; Freudenburg 1997; Picou et al. 2004; Picou and Marshall 2007). This “corrosive” social context prolongs the community impacts of these events as victims experience continuing sociocultural disruption, uncertainty regarding damages and reparations, and the use of ineffective coping strategies which result in self-isolation and the breakdown of social relationships (Freudenburg 1997; Arata et al. 2000; Picou et al. 2004).

As Hewitt observed, “...natural disasters are characteristic, rather than accidental features of the places and societies where they occur” (1983:25). On the other hand, technological disasters establish the parameters of low-probability, high consequence events that accompany the changing nature of risk in modern industrial society (Clarke 2006; Beck 2007). The adversarial discourse that emerges from institutional response failures also generates a series of “secondary disasters,” which includes socially constructed denials of damages by “principle responsible parties,” such as corporations, insurance companies, and government agencies. This anthropogenic context provides a source of continuing distress for disaster survivors who not only are suffering from the impacts of the original disaster event, but are repeatedly victimized by institutional and organizational decisions (Marshall et al. 2004; Picou and Marshall 2007; Brunsmma and Picou 2008). Modern catastrophes create social fragmentation and conflict between survivors and institutional authorities regarding the extent of community damage. Given these corrosive processes, timely community recovery becomes extremely problematic.³

The Need for Translational Interventions for Disaster Recovery

Disasters that result in massive contamination of the biophysical environment, that involve the failure of human controlled technology, or that are promulgated by the failures of anthropogenic processes present serious theoretical and applied challenges to sociologists for enabling community recovery. A prime example of a modern catastrophe that caused long-term social disruption, psychological stress, community fragmentation and continuous cycles of social corrosion is the *EVOS* (Picou et al. 1992; Gill 1994; Picou and Gill 1996; Picou et al. 2004). Although there have been numerous studies of other anthropogenic toxic disasters that verify this conflict pattern, there have been few, if any, attempts to actually invent and implement applied sociological programs to reduce chronic social and psychological outcomes. One important reason for this situation relates to the traditional disaster stage model, which from a structural functional perspective, outlines a direct sequence of community change from warning, threat, impact, rescue, inventory, restoration, reconstruction and recovery (Couch 1996; Picou and Marshall 2007). This model assumes that following the initial impacts of the disaster, timely community recovery occurs through the support of external agencies and the internal reorganization of community infrastructure. In fact an “amplified rebound” has been identified as occurring for the built and modified environments, as well as for residents of the impacted community (Drabek 1986).

In contrast, for technological disasters, a corrosive social cycle of “warning, threat, impact and blame” emerges and continuously repeats itself across a wide variety of secondary disasters that follow in the wake of the original contaminating event (Picou and Marshall 2007). Continued economic loss, social disruption, psychosocial impacts and

declining personal health slowly erode the social fabric creating a culture of self-isolation, collective trauma and social conflict (Erikson 1994; Freudenburg 1997; Arata et al. 2000). Erikson (1994) has described this chronic pattern of social pathology in the following manner:

Toxic disasters...violate all the rules...some...have clearly defined beginnings... others begin long before anyone senses that something is wrong...But they never end...An all clear is never sounded. The book of accounts is never closed (P. 148).

The challenges posed by toxic disasters are so serious that several social scientists have argued that community recovery from these events may be sociologically impossible. For example, Baum has observed that research on “natural disasters did not provide a good foundation” for responding to and facilitating community recovery from the radiation release at Three Mile Island (1987:46). Even more challenging is Edelstein’s assertion that community recovery to a “pre-disaster equilibrium” from massive ecological contamination may be “impossible” (1988:9). These sobering observations identify the context for moving toward a translational applied sociology that invents a social roadmap to community recovery.

Given this situation, it is apparent that alternative models and strategies for facilitating community recovery from modern disasters are needed. The remainder of this article will describe and provide data on one translational program which was created through a community-based participatory action approach. This program expanded conventional applied sociological principles by generating a partnership between researchers and residents and promoted the invention of disaster recovery strategies. This program linked research and community change with sociological data, community education, and the active participation

of disaster survivors (Whyte 1991; Hall 1981; Park 1993). This intervention program contained numerous interactive elements which promoted the emergence of relational knowledge that directly facilitated the role transition of survivors from “victims” to “recovery participants.” Elements of translational sociology, participatory research, applied sociology and public sociology were used before, during, and after program implementation. This translational program was found to be relatively effective for reducing chronic disaster impacts and developing a consensus strategy for transforming the corrosive community and providing a roadmap to community recovery.

The *Exxon Valdez* Oil Spill: Brief Background

The EVOS occurred approximately 20 years ago on March 24, 1989, when the supertanker *Exxon Valdez* ran aground on a well-marked reef in Prince William Sound, Alaska. The damaged vessel hemorrhaged over 11 million gallons of oil into the local pristine waters, but some have suggested that as much as 36 million gallons may have actually been released (Ott 2005:4-10). The EVOS was the largest and most ecologically destructive oil spill in the history of North America and had lethal impacts on local wildlife and the salmon and herring fisheries, which are culturally and economically linked to the survival of local residents (Picou et al. 1992; Spies et al. 1996; Carls et al. 1999; Heintz 2007). As would be expected, commercial fishermen throughout Prince William Sound suffered devastating economic impacts (Cohen 1993; 1994; 1997; Picou and Arata 1997). Likewise, Alaska Natives suffered severe cultural impacts, as their subsistence harvests were disrupted and their cultural calendar of resource availability and social exchange relationships were immediately severed and tainted with the risk of long-term contamination (Enter-Wada et al. 1993; Fall and Field 1996; Gill and Picou 1999; Picou 2000). Five

years following the spill, communities throughout the impact region were in disarray, characterized by patterns of social isolation, social conflict, increased alcohol consumption, domestic violence, suicide, personal depression, PTSD, and spill-related stress (Arata et al. 2000; Picou and Arata 1997; Ott 2008).⁴ This situation of collective trauma was the catalyst for the design and implementation of a participatory community intervention program implemented from 1995-1997.

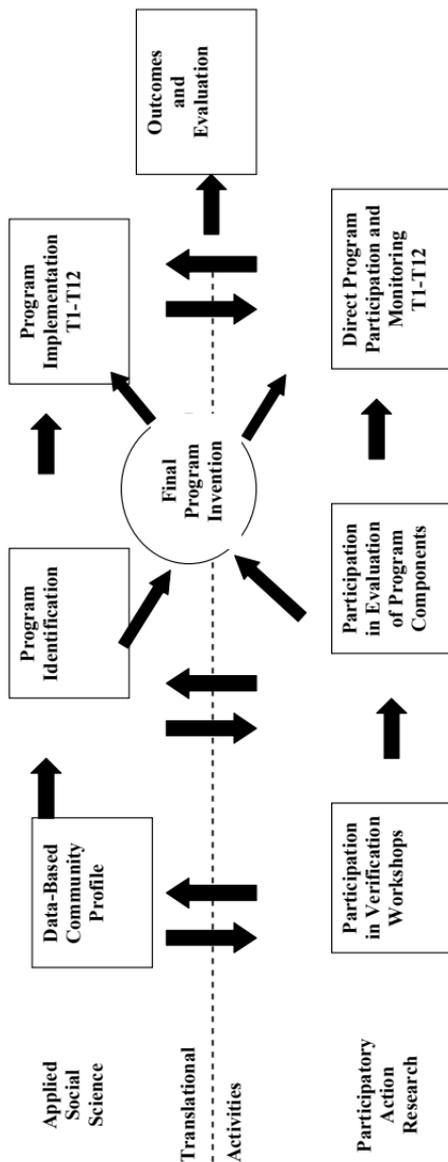
Cordova and the “Growing Together” Community Education Program

The community of Cordova, Alaska was selected for program implementation because it was essentially the sociological “ground zero” for the spill. Furthermore, generalizable community data on the social impacts of the EVOS were available for the years 1989 to 1992. Cordova is a small (approximately 2,500 residents), geographically-isolated, fishing community located in Southeastern Prince William Sound (Fried 1994). The community has been isolated since the 1964 Alaska earthquake and originally can be traced to four Eyak Native villages (Janson 1975). Cordova was incorporated in 1909 and at that time the economy was heavily dependent on copper mining. This economic base continued until 1939 (Stratton 1989). The present economy of Cordova is predominantly dependent on commercial fishing, with owners of nearly half of all Prince William Sound herring and salmon permits residing in the community (Stratton 1989). Over 90 percent of all Cordova residents engage in subsistence harvests and approximately 18 to 20 percent of the residents are Alaska Natives (Picou et al. 1992). Random household surveys were administered in Cordova yearly from 1989 to 1992 and in 1995 and 1997. A sample of commercial fishers was also interviewed in 1995 and 1997. These surveys collected information on perceptions of community conflict,

problems for community recovery, psychological stress, coping strategies, and community needs. The empirical data from seven years of research on the Cordova community was the source of information presented to the community that initiated this translational project.

Figure 2 presents a graphic description of the activities involved in the “Growing Together” Community Education Program. It should be noted that equal-status translational relationships between researchers and community residents occurred at every stage of the project. This pattern of constant interaction allowed for significant input from a wide variety of residents who participated in partnership with researchers for: verifying empirical research findings; inventing project materials; negotiating implementation strategies, and monitoring program outcomes. The first phase of the program involved the synthesis of social and psychological data collected in the Cordova community over the seven year period following the spill (Donald et al. 1990; Picou et al. 1992; Endter-Wada et al. 1993). A community profile was derived which provided valid and reliable data for a series of community workshops that involved community leaders and representatives of identified high-risk groups. From 1995 to 1996, this series of participatory workshops included representatives from civic, educational, mental health, religious, medical, and Alaska Native organizations. The general public was also involved in several information-based presentations that summarized the community profile and solicited possible activities, social inventions, and target populations for the program. These presentations were translational in nature, resulting in significant inputs from residents to researchers, which in turn, redirected program activities, strategies for information delivery, and the content of materials for delivery to residents. As such, the program was “invented” through these translational participatory activities during the first nine months of the project.

Figure 2 : Translational Community Participation Model for Program Development and Implementation.*



*Adapted From Picou et al. 1999: K14.

The second phase of program development utilized information from the mental health profile workshops to construct and propose specific mitigation activities. Once again, with maximum participation and feedback from community residents, these activities were evaluated in

terms of cultural appropriateness, community acceptance, and cost-effectiveness. Researchers then returned to Cordova and conducted additional workshops with residents and community organizations. These workshops focused on program content and significant changes were made in program elements for cultural appropriateness. The program was finalized and a timetable for implementation was agreed upon by researchers and residents. The researchers also established an intimate partnership with two local community organizations, the Sound Alternatives Mental Health Clinic and the Cordova Family Resource Center. These organizations were official sponsors of the project and assumed a localized leadership role for program implementation when researchers returned to the “lower 48”. This partnership facilitated continuous interaction between researchers, organizational leaders, and residents in the pre-implementation phase of the program.

From January 1996 to February 1997, “The Growing Together” Community Education Program was implemented. The participatory model used for program development from 1995 to 1996 resulted in the diagnosis that residents needed information regarding: the common and expected consequences of technological disasters; effective coping responses; and, resources to provide support for residents’ psychosocial problems (Picou et al. 1999). An outreach approach was collectively deemed critical for effective intervention, given that research suggested that only ten percent of the local residents were actually predisposed to utilizing local mental health resources (Picou and Arata 1997).

The “The Growing Together” program consisted of six components, each of which is described in Figure 3. A series of nine original newspaper articles, five original taped radio broadcasts, and nine original educational brochures were published, distributed or broadcast. These informational

materials focused on the community impacts of the EVOS, the nature of resulting patterns of psychological stress for residents, and the need to develop effective coping skills for adapting to sociological and mental health problems. Three original in-service training programs were also designed and delivered to teachers, clergy, and law enforcement personnel. One of the most important outreach components of the program was the “helping others” peer listener training program (PLTP). This program component involved the recruitment and training of local volunteers in lay communication, listening and referral skills. The PLTP directly focused on rebuilding social relationships and enhancing interpersonal trust among community residents.⁵ Finally, a “Talking Circle Ceremony,” which focused on the aftermath of the oil spill for Alaska Native culture and subsistence traditions, was organized through the Native Village of Eyak. The Talking Circle Ceremony involved leaders and members of Eyak Village in all phases of planning and implementation. The event lasted for two days and participants included residents of the Native Villages of Chenega Bay and Tatitlik, which are located in remote areas of Prince William Sound. Alaska Natives from throughout the state attended and spiritual leaders representing Alutiiq, Tlingit, and Eyak cultures participated in the ceremony (Picou 2000).

Figure 3. Translational Program Activities, Implementation Strategy and Target Population*

Activity	Description	Strategy	Target Population
Community Education Newspaper Series	Nine articles on technological disasters, their impacts and coping skills.	Run series in the <u>Cordova Times</u> .	Community
Community Education Radio Series	Program on coping skills and Technological Disasters Impacts.	Five-part program aired four times in community.	Community
Community Education Leaflet Distribution	Coping; stress response and information about technological disasters.	Distributed at locations throughout community. Mailed to residents.	Community
In-Service Training Program	Scheduled information on technological disasters presented to key professional groups in community.	Delivery of information (3 hour program) to clergy, teachers, and law enforcement personnel.	Key Community Professionals
Helping Others Peer Listener Program	Adult volunteers trained and provided materials for support counseling; 20 volunteers completed the program. Training DVD recorded.	Solicited volunteers, developed schedule, training updates.	Individual Level
Talking Circle	Alaska Native Community members participate in grieving cycle focusing on ecological destruction of EVOS.	Organized through traditional facilitators and invitation to community.	Alaska Native Community

*Source: Picou *et al.* 1999: K17.

The goal of the program was the mitigation of the chronic social and psychological impacts of the EVOS for residents of Cordova. More specifically, residents and researchers reached a consensus that program objectives should include: involving a significant proportion of community residents in program activities; involving people most severely impacted in all program activities; increasing help-seeking behavior; improving social relationships; strengthening relationships among Alaska Natives and raising awareness of cultural tradition; reducing levels of psychological stress among residents; and developing a model for mitigating chronic disaster impacts that would be portable and implementable in communities impacted by future disasters (Picou et al. 1999; Ka’aihue 1999). These objectives reflect a comprehensive community intervention that utilized elements of applied sociology, public sociology, and translational sociology encompassed by a participatory action research model.

Success of the Program: The Applied Translational Model in Action

The evaluation of the “success” or “failure” of this translational sociological intervention for reducing disaster impacts is complex and, at best, just a brief data collection point in the on-going cycle of chronic community distress. Nonetheless, a formal evaluation of the program’s objectives was conducted in 1997 through the use of random community surveys in Cordova and in Petersburg. In addition, pre and post program information was collected for commercial fishermen regarding psychological stress and impersonal relationships (Picou and Arata 1997). The results of the formal quantitative evaluation have been summarized by Picou et al. (1999: K51-K52):

1. **Planning.** The Project plan was developed with substantial levels of participation by a wide range of leaders and other citizens in the impact community. This approach allowed program development to emerge with maximum input from the local, grass-roots level.

2. **Implementation.** Each of the six components of the planned program was effectively implemented. Findings from the 1997 surveys of the community at large, and for commercial fishermen, show that Cordova residents had greater awareness of the program and its contents than did non-residents. Similarly, more Cordova residents reported that they participated in program activities than did non-residents.

3. **Targeting of the Implementation.** Individuals who had awareness of project programs, and/or had participated in the programs, were generally the more distressed community members. This finding suggests that the programs reached their intended audience—the intervention occurred with the “right” segment of Cordova residents, that is, those most in need of the educational information provided by the program.

4. **Outcomes.**

1. **Knowledge.** As hypothesized, residents in the target community demonstrated slightly greater knowledge of technological disasters, their effects, and coping than non-residents.

2. **Help-seeking Behavior.** Consistent with the goals of the program, residents of the target community engaged in greater levels of help seeking behavior than non-residents. Program participants who participated in peer listeners, read newspaper articles, or received information from mental health professionals also exhibited more help-seeking behavior.

3. **Social Relationships.** Results from the 1997 community surveys show no difference in changes in

personal relationships over the preceding year for targeted and controlled communities. This was a desired outcome of the intervention. Among the members of a major risk group, commercial fishermen, personal relationships had deteriorated more among Cordova residents than others. Nonetheless, listening to radio programs and receiving educational leaflets was associated with improvement in social relationships with relatives. In terms of effects of the Growing Together program on social relationships, the outcomes reveal significant improvement for those aware of the program and residents who listened to radio broadcasts.

4. **Psychological Stress.** Findings from community surveys show that measures of spill-related stress, including intrusive stress and avoidance behavior, declined more rapidly among Cordova residents than non-residents. Furthermore, significant declines in spill-related measures of psychological stress occurred for the majority of commercial fishermen, suggesting a rather effective and successful intervention for this high-risk occupational group. Nonetheless, psychological stress remained significantly higher in the impact community (Cordova). This pattern of findings is consistent with the following interpretation; the intervention may have had positive effects in reducing spill-related stress in the impact community, but these effects were insufficient to erase the long-term consequences of the *Exxon Valdez* disaster.

More specifically, Table 1 reveals the results of reports from a pre and post analysis of a cohort of commercial fishermen who participated in a variety of program activities. Social relationships with relatives and non-relatives improved significantly during the year that materials and activities from the translational program were distributed and conducted in the Cordova community. Furthermore, a drastic reduction in spill-related emotional problems was observed and health problems were also found to decline. These quantitative

data suggest that commercial fishers, an identified high-risk group for spill-related social and emotional problems, directly benefited from their participation in the translational program.

Table 1: Pre and Post Program Social Relationships and Perceived Emotional and Health Problems for Commercial Fishermen, 1995 and 1997

	1995 N=125	1997 N=89
Within last year relationships with non-relatives had suffered or ended.	36%	18%*
Within last year relationships with non-relatives had suffered or ended.	42%	18%*
Over the last year, I have had more spill-related emotional problems.	67%	27%**
Over the last year, I have had more health problems.	48%	26%*

Chi Square: * $p < .05$; ** $p < .001$

Qualitative data collected during and after program implementation also suggests a variety of successful outcomes for the Talking Circle and the PLTP. The events of the Talking Circle and subsequent cultural mobilization of the Native Village of Eyak has been discussed in detail elsewhere (see

Picou 2000). The Talking Circle functioned as a point for the revitalized engagement for the village and through the collective participation of elders, village leaders, families, and others, the infusion of cultural pride signaled direction for transformative action. Presently the village operates the Ilanka Cultural Center and Museum, as well as the Ilanka Medical Clinic. The annual Eyak village sobriety celebration held in Cordova attracts large numbers of visitors. Cultural activities are held frequently and the teaching of traditions to children and village members include dance, arts and crafts, drum-making, totem carving and seasonal subsistence harvesting practices. Although members of the village were severely impacted by the EVOS and the subsequent 13 years of litigation, the Talking Circle translated impacts to action and today Eyak Village moves forward with an active agenda designed to improve the lives of all Cordovans.

The PLTP involved over 20 local community volunteers who participated in a two-day training activity that focused on techniques for effectively communicating and building supportive social relationships for people in distress. Peer-listeners are not therapists. They comprise an informal support network that exhibits genuine, empathetic, caring, and sincere relations to community residents who are experiencing interpersonal and mental health problems. The training program addressed the development of appropriate listening skills and response styles, as well as focused trainees' attention to personal distress caused by anger, depression, PTSD, ambiguous loss, grief, and suicide ideation. Once trained, the Cordova peer-listeners have remained active in the community to the present. A subset of the trainees continues to have a collective identity and is still contacted by community residents who want to "talk about their personal problems."

The PLTP emerged as a portable, translational tool in 2000, when a second training session was conducted in

Anchorage for Cordova peer-listeners and residents from other Alaska communities. This session was shorter in duration, lasting approximately four hours. It was recorded and a DVD was produced (Peer Listener Training DVD 2001). The DVD, along with the Guidebook, was widely distributed through 2008. In October, 2008 an updated peer-listener training program was recorded in Cordova. This training program provided a brief review of the previous program, but included more specific information on building therapeutic social cycles and responding to ambiguous loss (Boss 1999). This program is currently being produced and DVD's will be available by Spring, 2009.

The "success" of the peer-listener program is hard to evaluate. The idea for inventing the program came from Cordova residents after data were reported to the community that the vast majority of residents were very reluctant to seek formal mental health counseling. From this translational process, specific mental health problems were identified and validated by survey data. A consensus was achieved regarding program content and the training session was developed cooperatively by an interdisciplinary team of psychologists and sociologists. Elements of the program have recently been used to train counselors, mental health professionals, teachers, and interested parties residing along the Mississippi Gulf Coast for mitigating the psychosocial impacts of Hurricane Katrina (Picou 2008b). In addition, workshops have been presented to residents of communities throughout the state of Alaska regarding responding to issues such as climate change and other disasters (Picou 2009a). In a recent conversation with three original Cordova peer-listeners trained in February, 1996, one stated:

"We will always be peer-listeners. Although some [original trainees] have dropped out or moved away, we still have people who seek us out and people that we seek out because we know they are having problems. Although there is no

way to tell how many lives we have saved, we know that we have made a difference. That's a good feeling to have.”

The translational character of the Cordova peer listener training program is apparent in the words of Cordova fisher, marine toxicologist, and author, Riki Ott, who states in her factual novel about the EVOS:

“The Peer Listener Training...began to prepare volunteers to help community members cope with mental health effects from the spill. Steve Picou anticipated a need for trained peers during his summer educational services on technological disasters and mental health...After the full training series, Peer Listeners were ready like volunteer firemen, to help people in crisis over the spill (Ott 2008:171)

The fact that the PLTR has been revised in 2008 and delivered to Cordova residents, victims of Hurricane Katrina, and residents of communities throughout the state of Alaska, attests to the initial and continuing success of this translational tool. (Picou 2008b; 2009a). The key to the PLTP is the formation of a group of local community residents who are trained to be available to distressed victims suffering chronic disaster impacts. Peer listeners help rebuild social relationships, thereby actively restoring one element of community social capital, which is often reduced in the aftermath of technological disasters (Ritchie and Gill 2007). Furthermore, peer-listeners are trained to identify and respond to mental health problems such as anger, PTSD, depression, suicide ideation, ambiguous loss and other outcomes that characterize chronic disaster impacts,

Thirty years after the Buffalo Creek disaster, limited evidence suggests that this small, rural area has re-created a sense of community through a form of adaptive resiliency, and not through the building of social capital (Schwartz-Barcott 2008:182). These changes occurred without the

aid of any translational programmatic interventions, although, over the years, there have been significant efforts to rebuild and modernize the physical infrastructure of the larger community (Schwartz-Barcott 2008:138-141) The translational applied Growing Together Program and the PLTP described in this article focused on rebuilding social relations and individual coping skills, thereby facilitating the “transformation to” or “re-creation of” communality (group solidarity) in a more timely fashion. Apparently, the lack of such sociological interventions results in the maintenance of a corrosive community context for as long as thirty years.

Conclusions

Modern disasters pose numerous challenges for timely community recovery. The possibility of catastrophic events has increased due to the limits of science, climate change, technological failure, and the uninsurability of modern risks (Beck 2007; Clarke 2006; Marshall and Picou 2008). The characteristics of twenty-first century disasters include chronic social and psychological impacts that defy recovery. Translational sociology provides an alternative approach for addressing the corrosive social order that is generated by catastrophic events and which, in turn, threatens the social fabric in late modernity.

The “Growing Together” community education program and the PLTP described in this article combined elements of translational, applied and public sociology. The small size and isolation of the community allowed for the implementation of a series of comprehensive translational activities. The applied sociology principles that were employed reflect the community as a client for the collection of data on social and psychological impacts. Throughout the design and development of the program, empirical research findings were reported to community organizations and residents. This reflects the initiation of a translational research

strategy. The constant “return flow” of information provided by community residents for validating research findings, modifying program components, inventing new components, and directing appropriate implementation strategies placed researchers and subjects as equal-status partners. This translational process continued for over a year, framing an interactionist theoretical foundation for the duration of the project. Applied disaster sociologists and disaster recovery specialists should consider this approach for mitigating the chronic social and psychological impacts of future disasters. Resources for implementing the model are readily available and modifications for unique communities and alternative impacts can easily be adapted to the program.

Endnotes

¹ In 2000, the original program won the Legacy Award given by the Pacific States/British Columbia Oil Spill Task Force. This award acknowledges the outstanding contribution of the Guidebook and Program for mitigating the social impacts of oil spill.

² Copies of both the original and updated DVD’s can be obtained from Joe Banta of the PWSRCAC. Contact Mr. Banta at banta@pwsrcac.org.

³ Elsewhere, along with colleagues, I have suggested that the distinction between “natural” and “technological” disaster is moot. The logic behind this claim is that natural disasters are increasingly becoming anthropogenic in context due to global warming and the fact that natech disasters emerge from violent meteorological and seismic events (Picou et al. 2004; Picou and Marshall 2007; Brunsuma and Picou 2008; Picou 2009b). Nonetheless, the utility of this distinction has been established in the broader context of disaster sociology (Clarke and Chess 2008), so I use this comparative perspective to frame the present research.

⁴ For an interesting factual novel on the emergence of the “corrosive community” in Cordova and the corresponding role of sociological research for community and personal recovery, see: Ott 2008

⁵ For more detailed information on surveys collected in Cordova, see Picou et al. (1999) and Picou et al. (2004).

⁶ All original program materials can be found in the Prince William Sound Regional Citizens’ Advisory Council publications “Coping with Technological Disasters: A User-friendly Guidebook” and “Coping

With Technological Disasters: Appendices.” www.pwsrca.org/projects/osrplan/coping.html. or the charter of principles, see <http://www.forumsocialmundial.org.br/>. For some background discussion, see Sen (2004b).

Author’s Notes: The development and implementation of the program described in this article was funded by a grant from the Prince William Sound Regional Citizens’ Advisory Council. Along with the residents of Cordova, AK, I thank them for their support. In particular, the support of Lisa Ka’aihue and Joe Banta is acknowledged. Numerous colleagues provided invaluable contributions throughout all phases of this project. Most notably, Duane A. Gill, Kati Arata and G. David Johnson. I sincerely thank them for their time, effort and on-site field work. Numerous residents of Cordova also contributed to this project. Among many others, the on-site field coordination provided by Patience Anderson Faulkner, Joey Cook, Belin Cook, Patti Kalander, Nancy Bird, Bud Janson, Mark Hoover and Mary Babic is acknowledged. Administrative and management support provided by Pat Picou for all on-site workshops, meetings and project activities was critical to the success of this project. The preparation of this manuscript was supported by a grant from the Rockefeller Foundation. The outstanding technical support provided by Carol Hicks for the preparation of this manuscript is also acknowledged. As always, the content and opinions expressed in this article are the sole responsibility of the author. Direct all communications to spicou@usouthal.edu.

References

- Arata, C., J.S. Picou, G. D. Johnson and T. S. McNally. 2000. “Coping with Technological Disaster: An Application of the Conservation of Resources Model to the Exxon Valdez Oil Spill.” *Journal of Traumatic Stress*, 13(1):23-39.
- Bates, F. and C. Pelanda. 1994. “An Ecological Approach to Disasters.” Pp. 149-159 in *Disasters, Collective Behavior and Social Organization*, edited by R. Dynes and K. Tierney Newark, DE: University of Delaware Press.
- Baum, A. 1987. “Toxins, Technology and Natural Disasters.” Pp. 5-54 in *Cataclysms, Crises, and Catastrophes*, edited by G. Van de Bos. Washington, D.C.: *American Psychological Association*.
- Baum, A. and I. Fleming. 1993. “Implication of Psychological Research on Stress and Technological Accidents.” *American Psychologist* 48(6):665-672.

- Beck, U. 1992. *Risk Society: Toward a New Modernity*. London, England: Sage.
- Beck, U. 2007. *World at Risk*. Cambridge, England: Polity Press.
- Blumer, Herbert. 1969. *Symbolic Interactionism: Perspective and Method*. Englewood Cliffs, NJ: Prentice-Hall.
- Brunsmas, David and J. Steven Picou 2008. "Disasters in the Twenty-First Century: Modern Destruction and Future Instruction." *Social Forces* 87(2):983-992.
- Boss, Pauline. 1999. *Ambiguous Loss: Learning to Live With Unresolved Grief*. Cambridge, England: Harvard University Press.
- Carls, G.M., S. D. Rice, and J. E. Hose. 1999. "Sensitivity of Fish Embryos to Weathered Crude Oil: Part I. Low-Level Exposure During Incubation Causes Malformations, Genetic Damage and Mortality in Larval Pacific Herring (*Clupea Pallasii*)" *Environmental Toxicology and Chemistry* 18:481-493.
- Clarke, Lee. 2006. *Worst Cases: Terror and Catastrophe in the Popular Imagination*. Chicago, IL: University of Chicago Press.
- Clarke, Lee and Caron Chess. 2008. "Elites and Panic: More to Fear than Fear Itself." *Social Forces* 87(2):993-1014.
- Cohen, M. J. 1993. "Economic Impact of an Environmental Accident: A Time-Series Analysis of the Exxon Valdez Oil Spill in Southcentral Alaska." *Sociological Spectrum* 13(1):35-64.
- Cohen, M. J. 1994. "Technological Disaster and Natural Resource Damage Assessment: An Evaluation of the Exxon Valdez Oil Spill." *Land Economics* 7(1): 65-82.
- Cohen, M. J. 1997. "Economic Impacts of the Exxon Valdez Oil Spill." Pp. 134-164 in *The Exxon Valdez Disaster: Readings on a Modern Social Problem*, edited by J. Steven Picou, Duane A. Gill and Maurie J. Cohen (eds.). Dubuque, IA: Kendall-Hunt Publishing Company.
- Couch, Stephen R. 1996. "Environmental Contamination, Community Transformation and the Centralia Mine Fire: Toward a Stage Model for Industrial Contamination." Pp. 60-85 in *Community Response to Industrial Disasters*, edited by James K. Mitchell. New York: United Nations University Press.
- Cuthbertson, Beverly H. and Joanne M. Nigg. 1987. "Technological Disaster and the Nontherapeutic Community: A Question of the Victimization." *Environment and Behavior*. 19:462-483.
- Donald, R., R. Cook, R. F. Bixby, R. Benda, and A. Wolf. 1990. "The Stress Related Impact of the Valdez Oil Spill on the Residents of Cordova and Valdez, Alaska: A Comparative Study Conducted

- by the Valdez Counseling Center.” Valdez, AK: Valdez Counseling Center.
- Drabek, T. E. 1986. *Human System Responses to Disaster: An Inventory of Sociological Findings*. New York: Spring-Verlag.
- Dynes, R. 1993. “Disaster Reduction: The Importance of Adequate Assumptions About Social Organization.” *Sociological Spectrum* 13(1):175-192.
- Edelstein, M. R. 1988. *Contaminated Communities: The Social and Psychological Impacts of Residential Toxic Exposure*. Boulder, CO: Westview Press.
- Endter-Wada, J., J. Hofmeister, R. Mason, S. McNabb, E. Morrison, S. Reynolds, E. Robbins, L. Robbins and C. T. Rooks. 1993. Social Indicators Study of Alaskan Coastal Villages: IV. Postspill Key Informant Summaries: Schedule C Communities, Part 1(Cordova, Tatitlek, Valdez) and Part 2 (Kenai, Tyonek, Seldovia, Kodiak City, Karluk, Old Harbor, Chignik. Prepared for Minerals Management Service, Alaska OCS Environmental Studies Program, Technical Report 155, OCS Study MMS 92-0052.
- Erikson, K. T. 1976a. *Everything In Its Path: Destruction of Community in the Buffalo Creek Flood*. New York: Simon and Schuster:
- Erikson, K.T. 1976b. “Loss of Communitality at Buffalo Creek.” *American Journal of Psychiatry* 133(3):302-305.
- Erikson, K. T. 1994. *A New Species of Trouble*. New York: Norton.
- Fall, J. A. and L. J. Field. 1996. “Subsistence Uses of Fish and Wildlife Before and After the Exxon Valdez Oil Spill.” Pp. 819-836 in Proceedings of the Exxon Valdez oil Spill Symposium. American Fisheries Society Symposium, Vol 18, edited by S. D. Rice, R. B. Spies, D. A. Wolfe and B. A. Wright.
- Freudenburg, W. R. and T. R. Jones, 1991. “Attitudes and Stress in the Presence of Technological Risk: A Test of the Supreme Court Hypothesis.” *Social Forces* 69(4):1143-1168.
- Freudenburg, W. R. 1997. “Contamination, Corrosion and the Social Order: An Overview.” *Current Sociology* 45(3):19-40.
- Fried, N. 1994. “A Trends Profile – The City of Cordova.” *Alaska Economic Trends* (March):1-4.
- Gill, D. A. and J. S. Picou. 1991. “The Social Psychological Impacts of a Technological Accident: Collective Stress and Perceived Health Risks.” *Journal of Hazardous Materials* 27(1):77-89.
- Gill, D. A. 1994. “Environmental Disaster and Fishery Co-Management in a Natural Resource Community: Impacts of the Exxon Valdez Oil Spill.” Pp. 207-235 in *Folk Management in the*

- World Fisheries; Implications for Fishery Managers*, edited by C.L. Dyer and J. R. McGoodwin. , Boulder,CO: University of Colorado Press.
- Gill, D. A. and J. S. Picou. 1997. "The Day the Water Died: Cultural Impacts of the Exxon Valdez Oil Spill." Pp. 167-192 in *The Exxon Valdez Disaster: Readings on a Modern Social Problem*, edited by J. Steven Picou, Duane A. Gill and Maurie J. Cohen Dubuque, IA: Kendall-Hunt Publishing Company.
- Green, Bonnie L., Mary C. Grace, Jacob D. Lindy, Goldine C. Glesser, Anthony C. Leonard, and T. L. Kramer. 1990. "Buffalo Creek Survivors in the Second Decade: Comparisons with Unexposed and Non-Litigant Groups." *American Journal of Community Psychology* 20:1033-50.
- Green, Bonnie L. 1996. "Traumatic Stress and Disaster: Mental Health Effects and Factors Influencing Adaption." Pp. 177-210 in *International Review of Psychiatry*, Vol. 2 , edited by F. L. Mak and C. C. Nadelson Washington, DC :American Psychiatric Press, Inc.
- Gunter, Valerie and Steve Kroll-Smith. 2007. *Volatile Places: A Sociology of Communities and Environmental Controversies*. Thousand Oaks: Pine Forge Press.
- Hall, B. 1981. "Participatory Research, Popular Knowledge and Power: A Personal Reflection." *Convergence* 14:6-19.
- Heintz, Ron. 2007. "Chronic Exposure to Polynuclear Aromatic Hydrocarbons in Natural Habitats Leads to Decreased Equilibrium Size, Growth and Stability of Pink Salmon Populations." *Integrated Environmental Assessment and Management*. 3(3):351-363.
- Hillsman, Sally. 2003. "The NIH Roadmap: Path to Better Health Research?" *ASA Footnotes* 31:8.
- Janson, L. E. 1975. *The Copper Spike*. Anchorage, AK: Alaska Northwest.
- Ka'ahue, Lisa. 1999. "Guidebook to Help Communities Cope with Oil Spills." *The Observer* 9(3):6.
- Kreps, G. 1995. "Disaster as Systematic Event and Social Catalyst." Pp. 231-55 in *What is Disaster*, E. L. Quarantelli London, England: Routledge.
- Kroll-Smith, J. S. and S. R. Couch 1991. "What is Disaster? An Ecological Symbolic Approach to Resolving the Definitional Debate. *International Journal of Mass Emergencies and Disasters* 9(3):355-366.

- Kroll-Smith, J. S. and S. R. Couch. 1993a. "Technological Hazards: Social Responses as Traumatic Stressors." Pp. 79-91 in *International Handbook of Traumatic Stress*, Edited by J. P. Winston and B. Raphael. New York: Plenum.
- Kroll-Smith, J. S. and S. R. Couch. 1993b. Symbols, Ecology and Contamination: Case Studies in the Ecological-Symbolic Approach to Disaster." *Research in Social Problems and Public Policy* 5:47-73.
- Kroll-Smith, J. S., S. R. Couch, and B. K. Marshall. 1997. "Sociology, Extreme Environments and Social Change." *Current Sociology* 45(3):1-18.
- Maines, David R. 1997. "Interactionism and Practice." *Applied Behavioral Science Review* 5:1-8.
- Marshall, Brent K. and J. Steven Picou. 2008. "Postnormal Science, Precautionary Principle and Worst-Cases: The Challenge of Twenty-First Century Catastrophes." *Sociological Inquiry* 78(2):230-247.
- Marshall, Brent K., J. Steven Picou, and Duane A. Gill. 2003. "Terrorism As Disaster: Selected Commonalities and Long-Term Recovery for 9/11 Survivors." *Research in Social Problems and Public Policy*. 11:73-96.
- Marshall, Brent K. J. Steven Picou and Christine Bevc. 2005. "Ecological Disaster As Contextual Transformation: Environmental Values in a Renewable Resource Community." *Environment and Behavior* 37(5):706-728.
- Norris, Fran, C.M. Byrne, E. Diaz, and K. Kaniasty. 2001. *The Range, Magnitude, and Duration of Effects of Natural and Human-Caused Disasters: A Review of Empirical Literature*. National Center for PTSD. Retrieved October 13, 2002 (http://www.ncptsd.org/facts/disasters/fs_range.html).
- Oliver-Smith, A. 1996. "Anthropological Research on Hazards and Disaster." *Annual Review of Anthropology* 25:303-328.
- Ott, Riki. 2008. *Sound Truth and Corporate Myths*. Cordova, AK: Dragonfly Sisters Press.
- Ott, Riki. 2008. *Not One Drop: Betrayal and Courage in the Wake of the Exxon Valdez Oil Spill*. White River Junction, VT: Chelsea Green Publishing.
- Park, Peter. 1993. "What is Participatory Research: A Theoretical and Methodological Perspective." Pp. 1-9 in *Voices of Change: Participatory Research in the U.S. and Canada*, edited by P.Park et al. Westport, CT: Bergen and Garvey.

- Peacock, W. G. 1991. "In Search of Social Structure." *Sociological Inquiry* 61(3):281-298.
- Perrow, C. 1984. *Normal Accidents: Living with High-Risk Technologies*. New York: Basic Books.
- Perry, R.W. and H. L. Quarantelli (eds.) 2005. *What is Disaster?: New Answers to Old Questions*. Philadelphia, PA: Xlibris.
- Picou, J. Steven, G. David Johnson, and Duane A. Gill. 1999
 "Mitigation of the Chronic Impacts of Localized Environmental Degradation: A Case Study of the Exxon Valdez Oil Spill. Pp. K1-K56 in *Coping with Technological Disasters: Appendices*.
 (www.pwsrcac.org/projects/osrplan/coping.html).
- Picou, J. S., D. A. Gill, C. L. Dyer, and E. W. Curry. 1992. "Stress and Disruption in an Alaskan Fishing Community: Initial and Continuing Impacts of the Exxon Valdez Oil Spill." *Industrial Crisis Quarterly* 6:235-257.
- Picou, J. Steven and Catalina M. Arata. 1997. "Chronic Psychological Impacts of the Exxon Valdez Oil Spill: Resource Loss and Commercial Fishers." Pp. J1-J39 in *Coping with Technological Disasters: Appendices*. Report to the Prince William Sound Regional Citizens' Advisory Council. (www.pwsrcac.org/projects/osrplan/coping.html).
- Picou, J. Steven, Duane A. Gill and Maurie J. Cohen (eds.). 1997. *The Exxon Valdez Disaster: Readings on a Modern Social Problem*. Dubuque, IA: Kendall-Hunt Publishing Company.
- Picou, J. Steven. 2000. "The 'Talking Circle' as Sociological Practice: Cultural Transformation on Chronic Disaster Impacts." *Sociological Practice* (2):77-97.
- Picou, J. Steven, Brent K. Marshall, and Duane. Gill. 2004. "Disaster, Litigation and the Corrosive Community." *Social Forces* 82(4):1493-1522.
- Picou, J. Steven and Brent K. Marshall. 2007. "Katrina as Paradigm Shift: Reflections on Disaster Research in the Twenty-First Century." Pp 1-20 in *The Sociology of Katrina. Perspectives on a Modern Catastrophe*, edited by D. Brusma, D. Overfelt and J. S. Picou Laham, MD: Rowman and Littlefield.
- Picou, J. Steven. 2008a. "In Search of a Public Environmental Sociology: Ecological Risks in the Twenty-First Century." *Contemporary Sociology* 37(6):520-523.

- Picou, J. Steven. 2008b. "Connecting Conversations: Reducing Disaster Impacts Through Peer-Listener Training." Work Shop presented at the Mississippi Gulf Coast Mental Health Summit. July, Biloxi, MS.
- Picou, J. Steven. 2009a. "Transforming the Human Community: Connecting Conversations for Peer Listener Networks." Workshops given at the Alaska Forum on the Environment. February 2-6, Anchorage, AK.
- Picou, J. Steven. 2009b. "Katrina as a Natchez Disaster: Toxic Contamination and Long- Term Risks for Residents of New Orleans." *Applied Social Science* (Forthcoming).
- PWSRCAC. 2001. "Peer Listener Training Program DVD Video." Anchorage, AK.
- Quarantelli, E. L. 1987. "What Should We Study: Questions and Suggestions for Researchers About the Concept of Disasters." *International Journal of Mass Emergencies and Disasters* 5:7-32.
- Quarantelli, E. L. 1998. *What is Disaster?* London, England: Routledge.
- Quarantelli, E.L., Patrick Lagadec, and Arjen Boin. 2006. "A Heuristic Approach to Future Disasters and Crises: New, Old and In-Between Types. Pp. 16-41 in *Handbook of Disaster Research*, edited by H. Rodriguez, E. L. Quarantelli and R.R. Dynes: Springer.
- Ritchie, Liesel Ashley, and Duane A. Gill. 2007. "Social Capital Theory As an Integrating Theoretical Framework in Technological Disaster Research." *Sociological Spectrum* 27:103-129.
- Schwartz-Barcott, T.J. 2008. *After the Disaster*. Amherst, NY: Cambria Press.
- Short, James F. 1984. "The Social Fabric at Risk: Toward the Social Transformation of Risk Analysis." *American Sociological Review* 49(6):711-725.
- Stratton, L. 1989. *Resource Use in Cordova: A Coastal Community of South Central Alaska*. Technical Paper 153. Anchorage, AK: Alaska Department of Fish and Game and Department of Subsistence.
- Tierney, K. J. and B. Baisden. 1979. *Crisis Intervention Program for Disaster Victims*. Washington, D.C.: U.S. Department of Health, Education, and Welfare.
- Waugh, William L. 2006. "Terrorism As Disaster." Pp. 388-404 in *Handbook of Disaster Research*, edited by H. Rodriguez, E.L. Quarantelli, and R.R. Dynes Springer.

- Wendt, A. 1992. "Anarchy is What States Make of It: The Social Construction of Power Politics." *International Organization*. 46:391-425.
- Webb, Gary R. 2002. "Sociology, Disasters, and Terrorism: Understanding Threats of the New Millenium," *Sociological Focus* 31(1):87-95.
- Whyte, William Foote (ed.) 1991. *Participatory Action Research*. Newbury Park, CA: Sage Publications.
- Williams, Stewart. 2008. "Rethinking the Nature of Disasters: From Failed Instruments of Learning to a Post-Social Understanding." *Social Forces* 87(2):1115-1138 (www.pwsrca.org/projects/osrplan/coping.html).