

## *Individual Stress, Collective Trauma, and Social Capital in the Wake of the Exxon Valdez Oil Spill\**

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Liesel Ashley Ritchie, *Natural Hazards Center, University of Colorado, Boulder*

This article examines persistent social impacts of the 1989 *Exxon Valdez* oil spill (EVOS) by focusing on the relationship between social capital and chronic individual stress and collective trauma, using Hobfoll's (1988) conservation of resources model of stress as an organizing framework. Data are based on in-depth personal interviews conducted 14 years after the disaster. Analyses focus on the ways in which stress-related behaviors associated with loss and threat of loss of various forms of resources have affected social capital in the renewable resource community of Cordova, Alaska. Findings reveal lower levels of trust, disruptions in associations, weakened social connections and networks, altered social discourses, diminished feelings of good will, and violations of norms of reciprocity. Behaviors associated with long-term stress related to the EVOS and to the associated protracted litigation are indicative of diminished social capital. This research highlights the critical importance of social capital as a collective resource and illustrates the ways in which decreased social capital can exacerbate individual stress and collective trauma.

Within hours after the supertanker *Exxon Valdez* ran aground near the Port of Valdez on March 24, 1989, almost 11 million gallons of black crude oil bubbled into the once-pristine waters of Prince William Sound (PWS). Ultimately, despite local, regional, and state contingency plans, the spill contaminated 44,000 square kilometers including more than 1,900 km of coastline. More than 20 years later, environmental, economic, and social impacts of this technological disaster continue to upset the delicate balance of PWS's bio-region. As of May 2010, only 10 of 26 resources and species have recovered from the oil spill and none of the four 'human services' (commercial fishing, passive use, recreation and tourism, and subsistence) have recovered (EVOSTC 2010). Pacific herring—a key subsistence and commercial fishing resource—have yet to recover.

Since 1989, community impacts of the EVOS have manifested themselves in the form of chronic individual stress and collective trauma<sup>1</sup>, post-traumatic stress disorder (PTSD), and ongoing social disruption related to ecosystem resource losses, as well as the threat of resource loss (Arata et al. 2000; Gill

and Picou 1998; Picou, Marshall, and Gill 2004; Ritchie 2004). For individuals, groups, and communities in PWS whose lives and culture are closely tied to ecosystem resources, these impacts persist. Protracted litigation associated with the spill, concluding with the 2008 U.S. Supreme Court decision, has been an ongoing reminder of the disaster that resulted in secondary trauma and ongoing community disruption (Gill 2008; Picou 2009). Although the court ruled that Exxon was responsible for the spill, it further determined that punitive damages be reduced from \$2.5 billion to \$507 million, a fraction of the \$5 billion that was originally awarded.

This article presents results of a 2001–2004 qualitative study of long-term social impacts of the EVOS on the renewable resource community (RRC) of Cordova, Alaska. Using Hobfoll's (1988) conservation of resources (COR) model of stress as an organizing framework, I examine ways in which stress-related behaviors in the aftermath of the spill have affected social capital in Cordova. This research contributes to the knowledge base regarding long-term social impacts of the EVOS in particular and to technological disasters in general in several ways. It adds to the extensive body of quantitative research regarding long-term community effects of the EVOS by providing rich, descriptive narratives that illuminate how changes in various resources—as well as perceived threats to resources—have interacted to foster individual stress and collective trauma. Findings from in-depth personal interviews shed light on how Cordovans have experienced stress associated with resource loss and threat of resource loss since the spill. Furthermore, the data illustrate ways in which attitudes and behaviors related to chronic stress have affected social capital in Cordova.

This research represents an effort to look more closely at the relationship between social capital and disasters. Despite numerous studies that emphasize how human-caused or technological disasters disrupt social order, research on the role of social capital in disasters is still in its infancy. Recognized by Quarantelli (2005) as a potentially “very useful” conceptual tool in the study of disaster-related activities, social capital is being incorporated into disaster studies around the world (e.g., see Beaudoin 2007; Dynes [1970] 2006; Hurlbert, Beggs, and Haines 2001; Koh and Cadigan 2008; Mathbor 2007). However, studies assume that predisaster social capital and resilience indicators predict post-disaster coping capacities, treating social capital as an independent variable. Expanding on earlier work (Ritchie 2004; Ritchie and Gill 2007), the research presented here considers social capital as a dependent variable that can change as a result of disasters themselves. Furthermore, this study addresses a call to qualitatively examine how access to and availability of social capital or lack thereof influence mental well-being (Almedom and Glandon 2008).

This work also expands on COR research. For example, although some COR studies have included qualitative methods (e.g., see Alvaro et al. 2010; Grandey and Cropanzano 1999), there appears to be no literature that examines qualitative data using the COR framework in the context of a disaster. The value of qualitative research in the study of social phenomena and social processes is well established (Denzin and Lincoln 2000). The rich, descriptive nature of qualitative data gathered and analyzed by experienced social scientists has the capacity to illuminate critical perspectives that might otherwise go unnoticed and unaddressed. As a subfield, disaster sociology has a rich tradition of qualitative research dating back to Prince's (1920) research on the 1917 Halifax explosion. It is in this context that the research presented in this article was designed and conducted.

### **Individual Stress, Collective Trauma, and Social Capital**

Although there are many definitions of social capital, the concept broadly refers to “social networks, the reciprocities that arise from them, and the value of these for achieving mutual goals” (Schuller, Baron, and Field 2000:1). Putnam (2000) defines social capital as “connections among individuals—social networks and the norms of reciprocity and trustworthiness that arise from them” (19). Generally speaking, the overall well-being of a given community is in large part a reflection of the availability of social capital.

A substantial body of empirical research has established that technological disasters tend to create higher levels of chronic, long-term stress than natural disasters (e.g., Baum and Fleming 1993; Gerrity and Flynn 1997; Gleser, Green, and Winget 1981; Grace et al. 1993; Smith and North 1993). Particularly in post-disaster settings where the cause of the event is perceived to be human error, individual stress and collective trauma can negatively affect both social structure and social capital. When technological trauma affects a group or community, once-stable social support networks are disrupted (e.g., see Erikson 1976). For example, social dynamics following technological disasters are often characterized by breakdowns in communication and a lack of a shared definition of what is taking place. This lack of consensus can affect social capital. Moreover, documented stress reactions to technological disasters involve adoption of coping strategies such as avoidance behaviors that can reduce social capital. These social processes affect critical dimensions of social capital by discouraging civic engagement, disrupting information flows, inhibiting norms of reciprocity, and causing trust to decline—in turn generating additional individual and collective stress (Ritchie and Gill 2007).

The ecological-symbolic perspective and concept of a RRC are also relevant to the study of social capital in the aftermath of disasters. The ecological-symbolic approach asserts that the effects of a disaster should be viewed

according to “whether they or not it significantly alters the relationships between a community, its built, modified or biophysical environments, and how people interpret and experience the changes in those environments” (Kroll-Smith and Couch 1991:361). An RRC relies on renewable natural resources for its primary cultural, social, and economic existences (Picou and Gill 1997). Given their close relationship with the environment, RRCs are particularly vulnerable to risks associated with ecological contamination resulting from technological disasters.

### **The Conservation of Resources Model of Stress**

Conservation of resources theory is based on the premise that “individuals strive to obtain, retain, and protect that which they value” (Hobfoll 1991:187). The COR model proposes that stress results from loss of resources, the threat of resource loss, and/or investment of resources without gain or return. The approach highlights four types of resources: (1) objects (e.g., transportation, shelter, physical possessions); (2) conditions (e.g., a good marriage, employment, seniority, tenure); (3) personal characteristics (e.g., high self-esteem, sense of mastery, social competence, sense of optimism); and (4) energies (e.g., time, financial savings, knowledge). Typically used in quantitative research to assess resource loss or gain, these categories can also serve as a heuristic tool to organize qualitative data.

Because it has the capacity to tap into constructs of personal as well as social resources, the COR model is useful in studies of disasters (e.g., see Arata et al. 2000; Freedy et al. 1992; Kaiser et al. 1996; Picou and Gill 1997). Traumatic stress, such as that associated with disasters, results from rapid loss of resources that are typically resources of highest value (e.g., loss of a loved one) (Hobfoll 1991). These stressors represent an assault on individuals’ and communities’ basic values, occur unexpectedly, place excessive demands on individual and collective resources, are beyond the “normal” scope of resource utilization, and leave behind a powerful mental image of loss. When loss of one type of resource is experienced, this often results in loss or depletion of other types of resources. Conversely, resource gain in one area tends to produce gains in other areas. Resource loss disproportionately outweighs the impacts of resource gain. Of greatest import to the present study, “a common, traumatic stressful event ... deplete[s] resources widely within a social system” (Hobfoll 1991:194). In settings where trauma is shared, interactions that are meant to provide social support can create a “pressure cooker effect” increasing stress rather than alleviating it. The implications of this for maintenance of social capital—which requires regular interaction—are important considerations.

### Research Design and Methods

Since 1989, several social science studies have documented the immediate- and long-term effects of the EVOS and the subsequent litigation.<sup>2</sup> Most of this work has been quantitative, employing designs that measure spill-related stress, resource loss, and social disruption. The research presented here—conducted 14 years after the spill—builds on this foundation using a systematic, qualitative approach to expand upon extant quantitative data through recording the narratives of individuals who experienced the spill and its aftermath. Although issues of recall should not be ignored, it is important to note that the focus of this study was not on the immediate aftermath of the EVOS but on interviewees' ongoing experiences and their perspectives on how the oil spill continued to affect Cordova in 2002–2003. Rather than articulating their experiences in the emotionally charged aftermath of the disaster, interviewees had time to reflect on a range of post-spill issues and to put them in context over a long period.<sup>3</sup> Notably, no one with whom I spoke blamed everything that was wrong with their lives or in the community on the EVOS. As one Cordovan put it: "What the hell would life have been like if that tanker hadn't hit that reef? We don't know.... They don't know. Nobody knows." Interviewees had come to see the complex ways in which the event had influenced the community and the lives of those who experienced it.

This work expands upon quantitative, longitudinal research conducted in the RRC of Cordova, Alaska, during the 1990s following the EVOS (e.g., see Arata et al. 2000; Gill and Picou 1998; Picou and Gill 1997; Picou, Marshall, and Gill 2004). Located on southeastern PWS between Orca Bay and the Gulf of Alaska, Cordova is accessible only by plane and ferry. According to 2010 census data, the community's population is 2,239—down 8.7 percent since 2000—of which about 10 percent are Alaska Native. Approximately half of all households in the community have at least one person employed in commercial fishing (<http://www.cdfu.org/history.html>).

The primary method employed in this study is structured in-depth personal interviews using a "criterion-based" or "purposeful sampling" process (e.g., see LeCompte and Preissle 1993; Patton 2002).<sup>4</sup> Individuals familiar with the Cordova community were asked to recommend potential interview subjects; these initial recommendations led to additional potential interviewees. Interviewees were purposefully selected for inclusion based on maximum possible diversity of age, race, gender, and roles in the community.

Using a semi-structured interview guide designed to explore relationships between social capital and documented effects of technological disasters,

**Table 1**  
Selected Interview Sample Characteristics

Characteristics	Number and percent of interviewees (%)
Male	22 (46)
Female	26 (54)
Alaska native	14 (29)
Married	31 (65)
With dependent children	26 (54)
Active commercial fishermen	22 (48)*
Spouses of commercial fishermen	11 (23)
Former commercial fishermen (in 1989)	11 (23)
Year-round cordova resident	42 (88)
EVOS litigant	38 (79)

\*Of the 22 active commercial fishermen, 17 were men and five were women.

I interviewed 48 people on location in Cordova (see Table 1) between August 2002 and June 2003. Additional topics such as personal and family background, as well as opportunities for participants to describe commercial fishing experiences, subsistence lifestyles, and ties to the environment, provided a context for exploring various aspects of social capital. These interviews yielded lengthy narrative accounts of life in Cordova before, during, and after EVOS, illuminating respondents' perceptions of community change following the disaster.

The sample included a number of key community actors including businesspeople, government officials, individuals associated with the Native Village of Eyak and Cordova District Fishermen United, individuals prominently involved in EVOS litigation, and mental health professionals. The average age of interviewees was 51, ranging in age from 28 to 85. The education levels of interview participants ranged from less than high school to advanced college degrees. On average, year-round residents had lived in Cordova 28 years; seasonal residents reported they had been coming to Cordova for an average of 32 years to participate in commercial fishing.

The average duration of each interview was two hours. Sessions were recorded and subsequently transcribed, quality checked, and edited. Additionally, I took notes during the interviews, recorded my own observations

immediately following interviews, and kept an extensive, detailed journal to enhance analysis of recorded accounts. Coding and analysis techniques followed standard guidance for the analysis of qualitative data (e.g., see Hesse-Biber and Leavy 2006; Lofland et al. 2006). Higher-level codes were developed based on particular questions in the interview guide. For example, one higher-level code, “Spill Stress Since 1989,” was used for all answers to the question regarding stress that interviewees attributed directly to the oil spill. As emergent themes became apparent, I created and used subcodes based on various types of stress described by interviewees—for example, loss of income, changes in family and community dynamics, damages to natural resources, devaluation of fishing permits, and involvement in litigation. As patterns in the data became identifiable, I organized these subcodes within the COR framework (i.e., as various forms of objects, conditions, personal characteristics, and energy resources).<sup>5</sup>

The following section presents research findings associated with behaviors related to individual stress, collective trauma, and diminished social capital in Cordova following the EVOS. Presentation of narratives was designed to ensure protection of human subjects and preserve the context and essence of interviewee comments to maintain accuracy.<sup>6</sup>

## Findings

### *Social Capital in the Renewable Resource Community of Cordova: An Ecological-Symbolic Perspective*

Combined, the ecological-symbolic approach and concept of an RRC permeate Cordovans’ commentaries on changes in social capital following the EVOS. The respect Cordovans have for the natural environment is evident in their actions as well as their words; they do not take their surroundings for granted, particularly since the spill. Their eloquence on the subject is evidence of residents’ appreciation for the delicate balance between harvesting, maintaining, and protecting regional resources, as well as cultural aspects of these processes. As one commercial fisherman and long-time Cordova resident put it, “nature owns this place. We are participants in it by the fact that nature relents enough to let us hang tough.”

Cordovans do not simply appreciate their natural surroundings because they do not know anything different. Most residents have experienced other settings and have chosen to locate themselves and/or their families in Cordova. In many cases, these decisions are based on wanting a lifestyle that includes a close relationship with the natural environments of PWS and the Copper River Delta. The population size and relative isolation of Cordova also influence how social capital is manifested. Said one Cordovan, “I don’t think

people [outside Cordova] realize ... what an intrinsic part of our lives our environment is.”

Two dimensions of social capital—trust and association—distinctly manifest themselves in Cordova as a direct result of issues identified in the ecological-symbolic approach and the RRC concept. Quantitative data collected by Picou and Gill since 1989 indicate that both cultural and social structural disruption have generated collective stress, which hinders capacity to address other issues that require prolonged dedication and energy. This is consistent with social capital research that contends communities with diminished social capital are less able to resist threats or take advantage of opportunities (e.g., Putnam 2000).

Subsistence activities among both Alaska Natives and non-Natives further exemplify the importance of social capital in Cordova (Ritchie and Gill 2010). A subsistence lifestyle represents social capital in that it relies on associations, networks, norms of reciprocity, and trust among family, extended kinships, friendships, and community. In Cordova, as in other subsistence communities, these abstract notions are manifested in very tangible ways. For example, an exchange of harvested natural resources such as salmon between Cordovans is not simply a transfer of goods, as with financial or physical capital. Rather, this symbolic sharing—a distinct form of association—generates trust and further association, the primary components of social capital. These activities help increase social cohesion, economic achievement, and social capital.

Because Cordovans are heavily dependent on seasonal cycles in the ecosystem, they are especially in tune with the environment and are more socially, culturally, economically, and psychologically susceptible—collectively and individually—to risks associated with biospheric contamination. Because of these intimate connections to the natural environment, the ecological devastation caused by the EVOS disrupted subsistence and cultural traditions, generating collective stress among Cordovans and others living in and relying on PWS for their well-being and livelihood. Those with closer ties to the natural environment (e.g., Native Alaskans, lifetime Cordova residents, fishermen, hunters, and naturalists) felt a greater impact from the spill than those without such ties. The following narrative epitomizes this situation:

It was tough.... It depends on the depth of your connection to the place.... The Native villages were more affected than Cordova, because they don't have much of a cash economy.... They require clean beaches and clean water and clean air to live, literally. It's just like the wildlife in a way.... In Cordova ... we are kind of the half way between mainstream America modern culture and Native subsistence life.... There's a lot of sharing that goes on here and we depend on the resource [because we also sell] what we gather. For those who have a very close connection, we were affected more than people who [did not].

Cordova's natural, built, and social environments have influenced residents' reactions to this technological disaster. As one woman put it,

We continue to be able to enjoy this [place] because we are Cordovans and that is what we do.... The land binds us together and brings us together and keeps us together. That is why the oil spill for me was so devastating because you just think, "Oh my God what have they done to my land?"

### ***Individual Stress, Collective Trauma, and Social Capital Following the EVOS***

Fourteen years after the spill, interviewees described losses in each of the four COR categories—objects, conditions, personal characteristics, and energy resources. Their narratives reveal connections between various forms of resources and how loss or threat of loss to these resources is related to behaviors linked to individual and collective stress in Cordova following the disaster.

#### ***"The Devastation Is Mind Numbing": Objects Resource Losses Following the EVOS***

Particularly because Cordova is an RRC, damage to the PWS bioregion represents a profound form of object resource loss. Because the extent of physical damage caused by the oil remains disputed, there is a general uncertainty in the community. In COR terms, the stress of chronic uncertainty represents a threat to Cordovans and to their way of life. As one commercial fisherman put it, "I am afraid of the future."

The crash of the herring population—believed by all interviewees to be a direct result of the EVOS—was articulated as one of the most tangible forms of objects resource loss. This loss was also manifested as a financial (energies) resource loss. As one non-fisherman put it, "The herring was always the bread and butter of the community." The herring fishery represented more than just a financial resource, however. The following narrative shared by the wife of a fisherman reflects broader environmental implications of this resource loss:

To go right to the heart of it, one of the most significant changes from the spill is the herring ... They [Exxon] can't tell you, or me, or anyone in this town that the lack of herring is from anything but from the spill.... The first couple of years made it look like there was going to still be a fishery, but the fact is that the fish that were born and released to the ocean ... their spawn encountered a tainted environment that had no food source.... You go right to the heart of the whole environment when you take away the basis for that lower level of life, then you take away food for every follow-up consumer after that.... You can't tell me that you dump that much oil and [there are no effects].

A commercial fisherman explained how the loss of the herring fishery continued to affect her<sup>7</sup>, reflecting ecological-symbolic aspects of the loss of this resource:

I am still sort of affected by ... not being able to fish herring. I think that was the saddest part for me by far.... the whole thing was taken away from us. I [feel] sadness and frustration at that.... Herring was a huge part of this town—the economy, the liveliness, the culture—and that’s gone.

Other forms of objects resource losses were also cited as stressful, as indicated by statements like this one: “People are going bankrupt. You see people losing their homes, losing their boats, and having to sell this, having to sell that.” Narratives of this nature are consistent with quantitative data on the EVOS reporting losses in this arena.<sup>8</sup> Among Cordova’s Alaska Natives and commercial fishermen surveyed in 2001, 63.4 percent believed PWS will never fully recover from effects of the oil spill. More than three-quarters of respondents (76.2%) reported loss of PWS resources in the past 3 years. During the same period, 63.2 percent of respondents reported loss of subsistence resources since the spill (Gill 2002).

Problems in the fishing industry since the EVOS serve as chronic reminders of threats to objects resources closely tied to conditions and energy resources. As a primary consequence of damage to the ecological environment of PWS, the employment and financial stability of many Cordovans was threatened. For example, the devaluation of seining and gillnet permits was frequently noted by interviewees: “[Before the EVOS] permits were going for over \$200,000 and now they are going for \$20,000.” According to 2001 data, 83.5 percent of Alaska Natives and commercial fishermen indicated losses with respect to commercial fishing as a resource (Gill 2002). In 2000, when asked to respond to the question, “Has the local economy gotten better, gotten worse, or stayed the same since 1989?” 90 percent of Cordovans believed the local economy had gotten worse (Picou et al. 2001).

Collective uncertainty associated with the threat of loss continued to be a stressor. As one commercial fisherman noted, “[Before the oil spill] we never lived with continual uncertainty. We might on a year-to-year or month-to-month basis, but not 14 years of uncertainty. It is the length of uncertainty [that is so stressful].” Another lifetime Cordova resident and commercial fisherman articulated the threat of loss to conditions resources and energy resources, as well: “I am afraid of not only losing my business, but losing my close family ties, my wife.... That worries me the worst on where I am going in the future not only financially, but [with] my family.” The threat of loss to objects and energy resources influenced conditions resources, as described in the next section.

***“There Are Similarities to Being in a War”: Conditions Resource Losses Following the EVOS***

Cordovans experienced considerable losses and threat of losses of conditions resources, including social support, employment, and good physical health. Findings clearly demonstrate how relationships between family members and community members were affected by events related to the disaster. As one person reflected, “I think there are similarities to being in a war because it just totally disrupts your life. Families were split apart.” As a commercial fisherman’s wife put it:

Every year on the anniversary [of the EVOS] there are times I have gotten really stressed out because my husband and people want to talk about the same thing over and over again. They don’t go forward at all.... They can’t get past that. I get frustrated.... You try to talk about it and you end up having an argument. That causes stress still.... It is every day in your face from one point of view or the other.

Numerous commentaries revealed how relationships between relatives have been strained in the aftermath of the spill: “[My brother and I] had this huge yelling match. I have never been as confused and upset, dwelling on the fight between me and my brother. [I’d] never been there before in my life. It really scared me.”

A mental health care provider gave this compelling narrative regarding effects of the EVOS on families:

Almost everybody that was here during the oil spill will tell you that that [it] is part of the reason why their family is falling apart or why they are still depressed. They may come out first and say, “My dad drinks too much and [my parents] fight a lot....” Then maybe two [counseling] sessions down the road [they’ll say], “If they just got their money from the oil spill, things would be better....” It re-traumatizes the kids. Within three [counseling] sessions I would say probably 85 percent of those kids that I see that come in with depression, whose families were here during the oil spill ... they brought something up about the oil spill or the secondary issues related to the lack of fishing or income.

Freudenburg and Jones (1991) contrasted the “therapeutic communities” that arise in natural disasters with the “corrosive” ones that emerge in the aftermath of technological events. The existence of corrosive community processes was evident in interviewee narratives. As one resident described the situation, “Watching the friendships disintegrate [was difficult]. People who had been friends for their whole lives [were] not speaking (*crying*). I wasn’t involved in that [but it] ... split a lot of friendships, lifetime friendships.” Damage to relationships was often attributed to financial pressure and greed: “I watched [this one guy] screw my relative [and] ... me. [This guy is] pressured to make those bills.... No doubt about it. He never [was like that before the spill].”

Having positive relationships with others fosters social capital. In Cordova, the corrosiveness of the post-EVOS social environment was not conducive to good relationships and instead produced stress—leading to additional corrosion. Commercial fishermen surveyed in 1995 reported negative changes in their relationships with relatives and non-relatives that were significantly correlated with high levels of stress and anxiety (Arata et al. 2000). In 2001, a significant proportion of Alaska Natives and commercial fishermen reported losses in “family stability” (25.2%), good marital/partner relationships (24.6%), and “time with loved ones” (40.2%) (Gill 2002).

Loss and threat of loss to natural resources have threatened conditions resources such as employment and financial stability, which created additional stress: “The uncertainty [I feel after the spill] is different [than] being uncertain how well your season is going to go.... Seeing that much death and decay and wondering if there is going to be anything left to provide for your family [is stressful].”

Physical health is another form of condition resource Cordovans reported as diminished following the EVOS. In 2001, more than half (51.2%) of Alaska Natives and commercial fishermen reported losses in personal health in the past 3 years (Gill 2002). Perceived changes in physical health among commercial fisherman reported 6 years after the EVOS were significantly correlated with anxiety, depression, and PTSD (Arata et al. 2000). Physical manifestations of stress people associated with oil spill-related activities were recounted in many narratives:

On top of all my other daily stuff I was having to dig up all of this [legal] paperwork bullshit for something that we had no control over or didn't want nothing to do with. It was eating on me.... I was stressed out.... There was some stuff that I couldn't even eat because ... I had an upset stomach a lot.

I think eventually I am just going to simply drop dead. I'll have a heart attack because I internalize all my stress (*laughing*).... I laugh because if you don't laugh you feel like bawling your eyes out, and there's just no point to it. You can only struggle for so long and then after a while you just lose the will.

Diminished trust, loss of ontological security, and changes in norms of reciprocity accompanying the demise of relationships following the EVOS fostered feelings of uncertainty, insecurity, and control. These feelings were manifested as personal characteristics resource losses, which are discussed below.

***“I Don't Know Why [The Spill] Had Such a Great Impact on My Sense of Well-Being”: Personal Characteristics Resource Losses Following the EVOS***

In the COR framework, mental health is a personal characteristics resource, which includes self-esteem, self-confidence, sense of mastery, sense

of optimism, and social competence. In 2001, more than one-third of Alaska Natives and commercial fishermen reported losses in various forms of personal characteristics resources. Losses were reported in such diverse areas as “motivation to get things done” (43.6%), “feelings of personal success” (46.5%), “feeling valuable to others” (32.3%), “feeling control over your life” (72.9%), “feeling independent” (38.6%), and “feeling that your life has meaning” (30.5%) in the past 3 years (Gill 2002).

Narratives of commercial fishermen, as well as narratives *about* commercial fishermen, articulated these resource losses. Shaking his head, one commercial fisherman stated, “I don’t know why [the spill] had such a great impact on my sense of well-being. I don’t know why.” Several commercial fishermen expressed feelings of low self-confidence and low self-esteem because of the EVOS:

[The oil spill] caused ... so many feelings of inadequacy.... [Before then] I was on top of the world. I was feeling good. By ‘93... my [belief] in the ability to be able to take care of my family dropped 100 percent. In [the early ‘90s] when I sold my home, I was ready to kill myself.... The depression was bad—really bad.... This makes me [feel] a loss of all self-confidence as a person.... When you lose hope and ... you’re making a third or a quarter of what you used to make, you lose self-confidence.

Because natural resources were damaged by the EVOS, pressure associated with making a living in the fishing industry also increased. This, coupled with loss of self-confidence, has been emotionally devastating to some commercial fishermen:

It’s always ... a lot of pressure to perform ... and make a living. That pressure is unreal now.... I *have* to [do well fishing]. I *have* to. I can’t just be average or else I won’t make it. It’s, I *have* to. It’s not as a relaxing thing anymore.... You’re always doubting your decisions. [You have] less self-confidence .... You’re always checking yourself. You’re always going, “Was that right?” ... Before I wouldn’t ask.... I knew.

As the spouse of a commercial fisherman observed:

Mentally, it hurt [my husband] badly because a man places his value with what he has done.... A lot of the fire, the energy, the love of life that he used to have, he doesn’t have anymore. That’s not something you can get back. He’s 60. He’s not the only one. A lot of the guys are just going through the motions.

Changes in family dynamics as described in these narratives—especially if they are occurring throughout a community as reported in Cordova—affect family quality of life and, more broadly, social capital. These changes are also related to demands on energy resources, which are discussed next.

***“There Isn’t Any Relief from the Effects of the Oil Spill”: Energy Resource Losses Following the EVOS***

Immediately after the oil spill, Cordovans were investing considerable energy resources (i.e., time and money) in dealing with threats to the fisheries and other natural resources in PWS by attempting to contain the oil and clean up the oil. In subsequent months and years, they were also occupied addressing economic and social issues associated with the disaster, as well as participating in spill-related litigation. Commonly, accounts of the pace of life in the months following the EVOS reveal how spill-related activities contributed to stress: “The stress I experienced is ... a kind that [develops] when you are working 7 days a week, 12 hours minimum, 14 or 15 hours sometimes, off and on for weeks and months on end.” In the years since the oil spill, energy resource losses have continued to have a negative effect on Cordovans:

The kids still need to eat. You still have bills and mortgages to pay.... The fisheries are declining; there are more regulations, shorter fishing times. There are so many things that bring it up every single solitary day because it all goes back to pre-Exxon [when] things were different. There is no money in town. The cost of living is constantly going up .... It is like there isn’t any relief from the effects of the oil spill, none.

Almost 71 percent of Alaska Natives and commercial fishermen surveyed in 2001 reported losses in adequate income in previous years. Similarly, 71.2 percent indicated losses of savings or emergency money (Gill 2002). These quantitative data regarding energy resources reflect the loss of important objects resources, including commercial fisheries.

In addition to being related to objects resource losses, energy resources are associated with changes in conditions resources. Many people made these connections:

You can pin [the stress] on [the oil spill] because this is where it comes from. These people are devastated. They can’t pay their bills.... Families have left [Cordova] because they don’t want to see dad start to cry his eyeballs out and they don’t want to see mom yelling at dad because there is no money coming in.

Maybe some of these people would have gotten divorced anyway, but I don’t think they would have done it quite so nastily.... You can’t tell me that it wouldn’t have been easier without that financial strife.

According to Hobfoll (1991), “If resources are used to offset resource loss, and resource loss or threat of loss is the basis of stress, then those who experience loss will become increasingly vulnerable to stress” (p. 189). Income loss spirals experienced particularly by commercial fisherman in the six years following the EVOS were significantly related to anxiety, depression,

and PTSD (Arata et al. 2000). In 2001, 63.6 percent of Alaska Natives and commercial fishermen indicated losses in retirement security (Gill 2002); many narratives described these circumstances. Commercial fishermen and their spouses thought of their fishing permits as their “retirement plan,” believing they would be able to sell their permits, boats, and gear and use the funds to live on for the duration of their lives. However, between the early 1990s immediately after the spill and the time of data collection, limited entry permit values dropped dramatically in PWS and as a result, such retirement plans are no longer a viable option:

The theory was you worked and you had the boat. You didn't have a retirement plan, but you had the boat that was going to be worth money and you had the permit that was going to be worth money and hopefully you put a little money aside. Now having the boat being worth nothing and the permit be worth nothing is a big deal because people don't have the retirement. There are people here that are just working because they can't stop working. That causes depression.

I'm at the retirement age and I don't see myself ever retiring. I will die doing what I am currently doing, simply because I can't afford to do anything else.

Loss of retirement savings has influenced Cordova's social structure, as many adults with young children are now in a position of supporting their own parents who can no longer fish or fish to a limited extent because of their age. The following narrative of a lifetime Cordova resident and commercial fisherman who is now in his 40s describes this situation:

What really Exxon did is [affect] people my mom and dad's age. Here's my mom and dad, [past retirement age] and no money, none at all to even pay monthly bills. The way the fisheries turned out since the oil spill, the old guys can't even compete with the young guys because there's one piece of pie out there and everybody wants a chunk of it.... When you're in your 70s you don't have the energy to compete with a 30-year-old kid.

A commercial fisherman and mother expressed sadness and loss of time with her young children, time she had expected to be able to make up for when they were older. An investment she had made in the fisheries—with the hope of being able to return that investment to her children not only financially, but with respect to building for their future relationships as well—has not paid off as she had anticipated:

I had traded some time away from the kids as youngsters [while I was out fishing] for what I felt would be time with them as teenagers [when they would be able to come fishing with me]. That was so valuable and that it was all possibly disappearing [was difficult].... [I saw] the kids in Cordova growing up here and the fabulous experiences they had ... spending weeks with their parents out fishing. This is what I wanted.

She was investing in the social capital, as well as the physical and human capital, of Cordova with the belief that ultimately her family would benefit. Instead, she experienced investment without return.

Cordovans have also invested substantial amounts of time in dealing with EVOS-related litigation. In 2001, 44.3 percent of Alaska Natives and commercial fishermen surveyed indicated they had “spent too much time with lawyers” as a result of EVOS litigation (Gill 2002). This narrative of a commercial fisherman’s spouse speaks to time as a lost resource, as well as to investment without return: “Every time you think you are finished with something [about the litigation] ... there would be something else. You have done all this and what for? To me the most valuable thing a person has is their time.” Many other accounts, such as this one, highlighted the theme of investment in EVOS litigation processes without return or gain:

I never really thought we would get any money because when you are fighting the largest corporation in the world, you kind of don’t have a lot of hope of getting anything.... You are filling out all this stuff so you are going to be eligible for this claim which at this point, as far as I can see, we are never going to get.

Even when people were working on spill cleanup activities and gaining financial resources, these activities do not appear to have compensated for other forms of resource loss. After the initial years following the EVOS, the “return on investment” in the cleanup was limited. This exchange between two commercial fishermen provided an interesting narrative about community dynamics in Cordova associated with whether people had worked on the cleanup or not:

R1: [Some people] were extremely wealthy from ... the cleanup and there was a lot of resentment, spillionaires or not. A lot of the people that weren’t spillionaires were so self-righteous.... There was a lot of gloom with the people who hadn’t made the money, a lot of hype with the people who had. But within two or three years....

R2: Everyone was even again...

R1: You are exactly right. It was turned around and you [were] ... in a better place if you hadn’t made any spillionaire money than you were if you would have had it.

EVOS litigation processes have quantifiably taxed energies and personal characteristics resources of Cordovans. Among commercial fishermen, Arata et al. (2000) found significant correlations between involvement in litigation and depression, as well as litigation and PTSD (see also Picou 2009). Ongoing litigation has served as a chronic stressor for many Cordovans. For example, as the spouse of a commercial fisherman commented, “I can’t get anything

from the attorneys anymore at the post office without actually almost having an anxiety attack. It has gotten to the point where their paperwork is almost as stressful as the actual spill itself was.” Another individual described the situation as follows:

The litigation process is where a lot of the trauma is right now. The spill is traumatic. We know that the oil is out there, and we know that it affected the economy, but nobody has paid for it. That is where the post-traumatic type symptoms come into [play].... This isn't our fault. Somebody needs to help us. We are losing our culture, our livelihood, and yet there is nothing. The litigation draws it out and keeps the feelings on the surface. It re-traumatizes folks.

***“It’s That Hit That Keeps on Hitting”:* Chronic Stress Following the EVOS**

Cordovans’ narratives reveal the chronic nature of stress following a technological disaster. As one Alaska Native commercial fisherman commented: “Since day one it has been stressful to this community and it hasn’t quit. It hasn’t stopped.” A majority of those with whom I spoke expressed a “reluctant resignation” (see Ritchie 2004), characterized by a realization and acknowledgment that they had little or no power over what was happening to them with respect to both the oil spill itself and the ensuing litigation. In some respects, this was a coping mechanism, a narrative that recognized their lack of control over corporate and legal processes. Virtually all interviewees expressed this sentiment, as the following comments indicate:

There are hard times and there are good times in fishing. There [are] times when we have had money. There are times when I have been rolling my quarters to make my last house payment before the damned season opens up again. You don’t mind the ups and downs of that, but when people start feeling like everything is stacked against them, and there is no relief.... That is what is so sad.

If you take the spill, the litigation ... it’s all one continuum and all part of the same process. It’s not been good. Most people can take a hit if it’s defined. Okay, that was the hit. They pick themselves up and start over and ... [do] whatever they have to do. But [the EVOS], it’s that hit that keeps on hitting (*laughing*).... It won’t be ‘after the spill’ until everything is done. As a group we are not going to pick ourselves up and move on until that’s done.

Feelings of being overwhelmed are not conducive to sustaining or creating social capital. When virtually everyone in a community has been affected by an event such as the EVOS, energies and resources to lend broad community support to individuals become limited. For Cordovans, dealing with spill-related issues—particularly ongoing litigation—has required continual investment of each of the four major types of resources in the COR model. In numerous cases, this has resulted in investment with little or no gain. In particular, narratives

describing personal characteristics resources being almost completely tapped suggest that whatever stores of resilience existed prior to the spill have been drawn down so that for years that has been little or none to spare to put toward rebuilding the community's social capital. Whatever does exist has primarily been invested at a personal or family level and does not necessarily translate into replenishing social capital in the broader community.

### **“Our Warriors Are Tired”: Summary of Findings and Discussion**

Almost 15 years after the EVOS, the narratives of Cordovans described diminished social capital that continued to affect the community. These sentiments are best expressed by a woman who until recently had been a commercial fisherman:

I think it's fair to say that the spill initiated a wave of pessimism in this town that still hasn't crested and broke. Honest to God, we went from a town and a fleet ... that thought any problem could be surmounted. We had a lot of faith in ourselves.... [We had] the attitude of, “Okay we are going to do our best to cope with this mess that you [Exxon] have created....” This town is not the town it was, not just financially and socially, but our willingness to tackle something [has changed]. It finally dawned on us that we could very well fail and be all tangled up in bureaucracy and red tape and details and expend our energy.... The willingness to put on your suit of armor and saddle up the mule and go after them has been steadily diminishing. People are more and more passive on all fronts—not just [with] Exxon, but the problems within the fishing industry, you name it.... If you're honest with yourself, you can't lay all of it on the spill. [But] there's a lot of processes that were set in motion by [the spill].... We were confident, and then it all came [to an end].... [We went] from “We can fix anything” to “I don't think we can fix anything.” It's gone 180 degrees.

Findings presented here demonstrate ways in which resource loss, threat of loss, and/or investment without return or gain, interact to create stress, resulting in behaviors that diminish social capital. There were no substantive differences in the way interviewees of different race, class, age, and gender described their experiences with respect to resource loss and threat of loss. This suggests that the long-term effects of the EVOS were pervasive for most Cordovans who experienced it. Moreover, according to quantitative data collected in 2000, 63.9 percent of Cordovans believed the community had become “more fragmented” since the EVOS—a reasonable proxy for diminished social capital (Picou et al. 2001).

In Cordova, chronic individual stress and collective trauma caused by the EVOS and related litigation have altered social relationships including trust. For example, EVOS-related meetings in the immediate aftermath of the spill were intensely emotional leading many respondents to stop attending such gatherings and withdraw participation in other social and civic activities where social capital is typically nurtured. One woman reflected on her awareness of this coping mechanism—avoidance—that evolved for her over time:

[For several years after the EVOS] I just went crazy and got totally obsessed with [the spill]. At one point I realized something had to give: it was [either] my family and the bitch I had become to live with or it was just to drop everything that had to do with oil and go into denial [about the spill]. That's what I did consciously. When we had meetings ... and [someone] came to give an oil presentation, I had to leave. I told [people], "It's not that I don't value what you are doing. I cannot cope with it. I just can't. I can't put myself through anymore of this. I value what you are doing, but I can't be involved...." It was an artificial barrier that I put up.... [I was] extremely guarded to where if anything came up about it I was out of there like a bolt of lightning just because I knew to be in the frame of mind I wanted to be in to live my life, just don't even say the word "Exxon." That went on for a few years, and I am sure I still avoid it. I am aware of my denial, and I don't think a lot of other people are conscious of [theirs].

Prior to the 2008 Supreme Court decision, almost three-quarters (73.5%) of Alaska Natives and commercial fishermen believed many people would leave the community in the event of a litigation payout (Gill 2002). The implications of this belief are twofold. First, if people are considering moving from Cordova, it is reasonable to assume that they are making fewer financial and social investments in the community. In other words, people may believe there is little value in investing social capital in a place where they do not intend to live long term. Second, if Cordovans believe their friends or neighbors plan to leave town, individuals intending to remain might be less willing to "invest" social capital in their interactions with those planning to leave or those they "think" are planning to leave. This situation is exacerbated because this threat of loss has been drawn out over an extended period of time.

Qualitative data such as the quote below suggest that a number of families have had to permanently move from Cordova as a result of spill-related financial pressures:

[The spill] forced a lot of people to leave. That's just the bottom line. You have to be able to pay your bills, and if you can't eventually the bank ... [will] foreclose. You've got at least three families that have left that were born and raised here.... The burden got too big. They had to go. They had to continue to feed their families. I know a couple of people in my generation, the women, would like to stay.... But, because it is so painful for their men to have to try and live here, the men want to leave. They feel like they've failed. They're beating their heads up against the wall trying to make a living, and it's a hard row to hoe.

Other accounts describe how people spend considerably less time in the community as a result of economic conditions and, in some cases, social conditions. For example, seasonal commercial fishermen who before the EVOS returned to Cordova weeks in advance of the fishing season now arrive at the proverbial last minute—perhaps just a couple of days prior—because they cannot financially afford to come back earlier or because they hold down another job for as long as possible in the off season. Particularly in a community the

size of Cordova, subtle changes like these in the community's social fabric influence social capital.

Each time a family or individual moves, even if that family or individual is replaced by another, social capital (as well as human capital) is diminished at least temporarily. The notion that "outsiders just don't understand" (Edelstein 2000) how the EVOS affected Cordova applies to some extent for newcomers to the community. Although new arrivals may be able to sympathize with the experiences of those who lived through the disaster and subsequent years, it is difficult for them to empathize. This creates social fissures that detract from the community's ability to generate new social capital and to support individual recovery and well-being.

Those on the proverbial front lines of EVOS litigation grew weary after years of battles to maintain some semblance of their way of life: "Cordovans have gotten so beaten down. [The EVOS situation] has taken a lot of the fire out them. They essentially lost a lot of heart. People are tired." The Cordova community started out strong, with considerable resources to deal with a variety of challenges. By 2001, however, resources at many levels were tapped, as the spouse of a commercial fisherman commented: "I think there was a strength there, but the battle has been going on so long and [some people have] fought on so many different battle fronts [they are] war weary."

Depletion of objects resources, coupled with diminished conditions resources, personal characteristics resources, and energy resources have created a complex and socially taxing environment for Cordova residents who are simultaneously experiencing similar losses. In essence, the community experienced a social capital loss spiral much like the economic loss spiral noted by Arata et al. (2000). Diminished social capital decreased availability of latent social capital—potential individual and group energy. Efforts to survive in the community, to just hold on, are not conducive to building or maintaining social capital. Efforts to "hang in there" involve avoidance behaviors that have continued to affect social dynamics and deplete social capital in Cordova, hindering Cordova's ability to take effective collective action to address social and economic issues facing the community.

For at least 15 years following the disaster, individual and collective responses to stress negatively influenced social capital in Cordova. And yet, among many in the community, there remains optimism:

So much has already been lost. We will never ever be able to get back what was lost, never. Not environmentally and not economically—maybe sociologically, as the mindset comes around that we are still all in it together and that Exxon is the one that created the problem.... I think that with time the community can heal itself emotionally.

## Conclusions

This study of Cordova, Alaska, offers an alternate but complementary approach to previous and ongoing research examining community responses to the EVOS and to technological disasters in general. Although there is extensive quantitative empirical evidence of the social and psychological impacts of the oil spill on Cordova, this is the only systematic, qualitative research to examine how and why these effects persisted over time. The qualitative data presented here shed light on the *meanings* that individuals who experienced the EVOS have assigned to this event and its aftermath, capturing nuances that can be overshadowed in quantitative data.

This research also contributes to the body of knowledge on the EVOS and to the broader field of disaster studies by exploring the relationship between chronic stress, stress-related behaviors, and social capital. It advances understanding of the long-term effects of technological disasters on individuals through the lens of the COR model—a psychological paradigm. Perhaps more importantly, by exploring the long-term effects of stress-related behaviors on social capital, this research highlights the critical importance of social capital as a collective resource and illustrates ways in which diminished social capital can exacerbate individual stress and collective trauma. Thus, social capital represents an important sociological paradigm that should be considered as more than a passing fad.

The implications of the findings are critical: especially in post-technological disaster settings, resource loss and/or threat of loss—particularly over time—combine to create individual stress and collective trauma that affect the capacity to generate and sustain social capital during the very time when trust and positive relationships are critical. This knowledge is relevant to community recovery and resilience-enhancing efforts. Just as financial and human capital are brought to bear to support post-disaster recovery, investments must also be made in social capital. As an example, response and relief efforts should be coordinated to ensure that they do not damage social networks, associations, and trust. Future research should continue to explore the impacts of disasters on various dimensions of social capital as well as the role of social capital in disaster recovery.

## ENDNOTES

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<sup>1</sup>Collective trauma is “a blow to the basic tissues of social life that damages the bonds attaching people together and impairs the prevailing sense of communality” (Erikson 1976:154).

<sup>2</sup>Four social science projects were initiated or continued between 1989 and 1992: (1) the “Oiled Mayors Project,” (2) the “Cordova Community Study,” (3) the “Social Indicators Study,” and (4) “An Investigation of the Sociocultural Consequences of Outer Continental Shelf Development in Alaska: Prince William Sound.” For citations too numerous to list here see Ritchie (2004) Chapter 2 and Picou et al. (2009).

<sup>3</sup>For additional information see Ritchie (2004), chapter 7.

<sup>4</sup>I also engaged in extensive participant observation; see Ritchie (2004), chapter 3.

<sup>5</sup>For additional information see Ritchie (2004), chapters 3 and 5.

<sup>6</sup>One of the primary challenges associated with presenting the findings of qualitative research in peer-reviewed publications is page limitations that preclude inclusion of more than a small subset of available data. The quotes presented in this article are drawn from my dissertation (Ritchie 2004) where I share many more narratives that support the findings discussed here. Rather than only selecting quotes that make the case for my arguments, I have included narrative data that illustrate convergence around the themes about which I’ve written. These examples are representative of other narratives not included in the article.

<sup>7</sup>Women involved in the Alaska commercial fishing industry typically refer to themselves as “fishermen.”

<sup>8</sup>EVOS data collected through a panel study of Alaska Natives and commercial fishermen ( $N = 176$ ) in 2001 highlight various aspects of social capital in Cordova including perceptions of community, social disruption, psychological stress, trust, resource loss, social recovery from the spill, and EVOS-related litigation (Gill 2002). Additional quantitative data presented here come from Arata et al. (2000) and Picou et al. (2001).

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