Published in final edited form as:

Soc Nat Resour. 2020 ; 33(3): 386–405. doi:10.1080/08941920.2019.1709002.

“The Community Helped Me:” Community Cohesion and Environmental Concerns in Personal Assessments of Post-Disaster Recovery

Kelly Bergstrand¹, Brian Mayer²

¹601 S. Nedderman Drive, Department of Sociology and Anthropology, University of Texas at Arlington, Arlington, TX 76019

²P.O. Box 210027, School of Sociology, University of Arizona, Tucson, AZ 85721, (520) 626-2190

Abstract

This study investigates long-term appraisals of community recovery after a major environmental disaster. Specifically, we conducted a survey of 351 individuals living in coastal counties in Alabama and Florida on the five-year anniversary of the Deepwater Horizon oil spill. Using mixed methods that combined content analysis and ordinary least squares regression, we find that residents who believe they live in a community where neighbors help each other are more likely to see their communities as recovering. Conversely, reporting major effects from environmental problems, like lost fishing income, reduces perceptions of community recovery. Five years after the oil spill a majority of respondents saw little economic recovery and almost half perceived low environmental recovery. This reflects the importance of the environment to the long-term health and success of areas dependent on natural resources. It also suggests the need for directing funding toward community-level programs and preserving shared natural resources post-disaster.

Keywords

BP oil spill; community; disasters; environment; recovery; social ties

Introduction

The outpouring of public support, sympathy, and philanthropic or state-based aid that often flows into communities impacted by disaster is frequently insufficient for fueling a full recovery towards pre-disaster conditions (Gill, Ritchie and Picou 2016). The damages experienced by disaster victims persist long after media and philanthropic attention fades (Birkland 1997). Consequently, fully recovering from a disaster can be a protracted process, emphasizing the need for a long-term perspective on how recovery processes unfold (Cope et al. 2013; Gill, Ritchie and Picou 2016). The role of community, both in terms of the objective social structures that mobilize scarce resources along with the subjective aspects of belonging and attachment, remain comparatively understudied aspects of the disaster cycle (Cox and Perry 2011). Quantitative indices of disaster vulnerability and resilience allow us

to measure the number of civic organizations in an area, voting rates, migration patterns and other social phenomenon to appraise pre- and post-levels of social ties holding a community together (Cutter et al. 2003; Sherrieb et al. 2010). However, other subjective aspects of communities—such as whether informal interactions generate solidarity or if a sense of belonging increases resource sharing—are less studied, though the importance of perception of community resilience is increasingly recognized as at least an equally significant, if not better, indicator of the capacity to respond and adapt to crises (Kulig et al. 2008; Kulig et al. 2013).

For many communities, the surrounding natural environment is more than scenic; the ecosystem services they provide support that community's way of life. This is true for many communities of the Gulf Coast region of the United States (Clarke and Mayer 2017). For example, tourism to the region is a major economic driver, reliant on attractive white sand beaches and marine estuaries to draw visitors. Furthermore, generations of families have made their livelihood from fishing, shrimping, and oystering in the Gulf of Mexico. For these families, marine occupations are not just a source of income, but part of their heritage and identity (Clarke and Mayer 2017). In this way, "community" and "environment" are not separate concepts, but deeply intertwined in defining what it means to live and work along the Gulf Coast. As other scholars have noted (e.g., Block et al. 2019), while the importance of social ties is increasingly recognized as important to disaster resilience, little attention has been paid to the influence of landscapes in the post-disaster recovery process. Therefore, in thinking about the process of community recovery, our definitions and operationalizations of community need to be expanded to include not just repairs of houses and offices, but of estuaries and natural spaces.

To investigate the impact of disasters on the social and ecological fabrics holding communities together, we analyze survey data collected on the five-year anniversary of the 2010 *Deepwater Horizon* oil spill from regions directly and indirectly affected by the disaster. We find two key mechanisms matter for perceptions of community post-disaster recovery: evaluations of community cohesion and concerns about the viability of natural resources. Believing that one lives in a place where neighbors look out for each other saw increased perceptions of recovery, across multiple domains (environmental, social and health-related). Conversely, worries about fishing losses resulted in negative evaluations of recovery, across different arenas (economic, environmental and social). Many studies focus on individual recovery but less look at perceptions of community recovery, especially over time (Flint and Luloff 2006). Here, we look at perceptions of recovery, across a variety of arenas. As we increasingly move towards a national and international agenda for building resilient communities, we need to think more about holistic community recovery and macro-level post-disaster funded programs (e.g., community centers and natural resource preservation and rehabilitation), especially in the longer-term.

Recovering from Disaster

What does it mean for individuals and communities to recover from disasters? Previous studies have identified a number of demographic traits that affect both the capacity to withstand the impact of a disaster as well as to quickly bounce back. These factors

include traits such as socioeconomic status, gender, race, ethnicity, age— as well as traits of the community, such as the size of the population, how structurally sound buildings are, whether there are hospitals, and the diversity of industrial sectors in the area (Cutter et al. 2003; Cutter et al. 2008; Enarson and Morrow 1997; Sherrieb et al. 2010). Civic facets matter too, where rates of volunteering and voting rates or the number of non-profit organizations in the area also can be used to predict the pace of recovery (Sherrieb et al. 2010). Today, disaster researchers view these community aspects of social cohesion as an important predictor of community resilience, allowing individuals and communities to quickly mobilize vital resources for coping with short-term impacts and managing longer-term recovery (Townshend et al. 2015).

Community Cohesion and Attachment to Place in the Recovery Process—

Disasters have the ability to disrupt the basic social fabric that guides and shapes personal interactions and collective norms, often leading to the erosion of communal trust and group functioning (Erikson 1976; Kroll-Smith and Couch 1990). This disruptive effect was identified early on in the social science literature on disasters by Erikson (1976), who chronicled how a flood wiped out community social networks and left its residents emotionally distraught, despite having been relocated to a safer location. For victims of the flood, the recovery efforts were incomplete and lacked those social relations that constituted the “community.” Furthermore, disasters by definition overwhelm local capacities, necessitating the inflow of informal and formal assistance from elsewhere through social networks (Beggs, Haines, and Hurlbert 1996).

An essential element of disaster-resilient communities that must cope with disruptions in the flow of resources and assistance is *social cohesion*, which includes more formal conceptualizations of social capital and networks along with other important social phenomenon such as social participation and community engagement (Norris et al. 2008; Townshend et al. 2015). Reimer et al. (2012) identified four types of normative systems that help guide individuals and communities in preparation for, and in response, to disasters: market, bureaucratic, associative, and communal. While these types of formal and informal norms are important in holding communities together, so too are the perceptions that those ties exist and function in the manner expected. This is one way that community perceptions can translate into recovery outcomes. Specifically, Norris and Kaniasty (1996) find that perceived support, such as believing that helping behaviors will be provided when needed, is an important component to mitigating psychological distress after a disaster, mediating the relationship between received support and mental health. In another example, Chamlee-Wright and Storr (2011) find that through the sharing of collective narratives, community members assess their own likelihood of recovery, which then can have real consequences for actual recovery. For example, shared beliefs that community members are resilient and hard-working contributed to creative and self-reliant ways of addressing problems. Thus, perceptions of support and recovery can matter in shaping how communities rebound from disaster.

The concept of social cohesion also includes an individual’s sense of place and belonging within his or her community (Buckner 1988). Place attachments incorporate both individual and communal aspects of identity and provide stability and order; disruptions, as occurs

with disasters, can then threaten a sense of self and become overwhelming (Brown and Perkins 1992; Jorgensen and Stedman 2006; Townshend et al. 2015). Neighborhoods are more than just a collection of houses; fulfilling shelter needs (i.e. by providing temporary mobile homes or group quarters) after a disaster fails to restore the communal bonds and identities that make a community (Erikson 1976). For example, a sense of place was one reason motivating residents to return to New Orleans after Hurricane Katrina; they believed that the city and their neighborhoods “possess a unique bundle of characteristics that, when taken together, constitute a sense of place that cannot be found or replicated elsewhere” (Chamlee-Wright and Storr 2009: 621). Further, when valued places are disrupted, such as by environmental distress, this can create the experience of ‘homesickness’ even though community residents are still ‘at home’ (Albrecht et al. 2007). Such a sense of place plays an important role in the creation and maintenance of social cohesion and, ultimately, community resilience (Cox and Perry 2011; Townshend et al. 2015). In turn, how strongly people are attached to their communities and how optimistic they are about the community’s future, including the strength of its natural resource base, could have real effects for whether they are willing to stay in the face of damages inflicted by an environmental threat, or move away. There is much at stake in these decisions; for neighborhoods and small towns, a mass exodus of members could result in a ghost town where the rebuilding process is severely stunted (Kroll-Smith and Couch 1990).

Environmental Concerns and Community Recovery—Social cohesion is one domain that could affect recovery; a second is people’s perceptions and attachment to their natural environments. However, aspects of place attachment to the ecosystems that people depend on are rarely included in most conceptualizations of community loss following a disaster. For some communities, natural resources are critical to the heritage, identity, and livelihoods of the people who live and work there. For example, after the *Exxon Valdez* oil spill, the collapse of the herring fishing industry, which in one affected area had accounted for almost one-third of the local economy, caused damages that persisted for over a decade (Gill, Ritchie, and Picou 2016). Such effects were not just economic, but included disruptions to traditional ways of life, residents’ sense of place, and connections to the environment.

As the above example illustrates, environmental destruction can cause harm to communities through multiple mechanisms. Communities highly dependent on natural resources, such as coastal communities that rely heavily on fishing and aquaculture, are particularly vulnerable to disasters that harm this resource base and reduce their ability to sustain livelihoods (Pomeroy et al. 2006). Further, a reduction in quality and function of the natural environment can contribute to the harm experienced by residents both during and in the aftermath of disasters. Deforestation can exacerbate damages caused by a number of types of disasters, including landslides, floods, and droughts (Srinivas and Nakagawa 2008). Residents may also react directly toward environmental losses with feelings of grief and sorrow. Cunsolo and Ellis (2018) define ecological grief as “the grief felt in relation to experienced or anticipated ecological losses, including the loss of species, ecosystems and meaningful landscapes due to acute or chronic environmental change” (p. 275). Aspects of the landscape taken for granted become noticeably and painfully absent. McKinzie (2019)

finds in interviewing residents after a tornado that the loss of trees led to feelings like strangeness, disbelief and grief, with residents sometimes noting the loss of environment was also a loss of self. Block et al. (2019) found that individuals attached to the environment experienced grief after wildfires at the loss of surrounding nature and expressed positive and restorative effects when watching the vegetation regrow and wildlife return in the years that followed.

The emotional connections that members of a community feel toward the environment, and the fallout that occurs when environmental harm occurs, also speak to a sense of place. People develop emotional bonds to places and such place attachments are tied to our identities and how we view ourselves, ultimately affecting well-being (Brown and Perkins 1992; Knez et al. 2018). This sense of place can encompass the larger environment, including natural landscapes and ecosystem services (McKinzie 2019; Urquhart and Acott 2014). However, in looking at place attachment and disasters, scholars tend to prioritize the social components (e.g., social capital and community) over the natural environment (Block et al. 2019). The natural environment, particularly for natural resource dependent communities, plays a central part of this social construction of place and place-based communities' identities. When ecosystems and the services they provide are threatened by crises and disasters, so too are the individual and communal identities associated with that place similarly endangered (Jorgensen and Stedman 2006; Urquhart and Acott 2014).

Case Study: The *Deepwater Horizon* Oil Spill

The 2010 *Deepwater Horizon* oil spill in the Gulf of Mexico was the largest marine oil spill to ever occur. The scale of the oil spill was massive, affecting over a thousand miles of coastline and impairing seafood and tourism industries across multiple states (Nixon et al. 2016; Smith et al. 2011). In coastal communities, there were widespread concerns about economic effects from industry losses, as well as social and emotional repercussions as affected residents grappled with the uncertainty and damage wrought by the spill (Gill, Picou and Ritchie 2012). For instance, public concerns about how the oil spill might contaminate seafood or result in slick-covered beaches led to a surge in vacation cancellations from Gulf-bound tourists and consumer decline for Gulf-caught seafood (McKendree et al. 2013; Smith et al. 2011). The stress of the oil spill also seeped into social networks, as some residents noted corrosion in the social ties of their communities due to both the spill itself as well as problems with the BP disaster compensation process (Mayer, Running and Bergstrand 2015). There were significant mental health impacts for residents in affected areas like coastal Alabama, which saw relatively high levels of event-related psychological stress (Gill, Picou and Ritchie 2012).

Here, we examine perceptions of recovery in Florida and Alabama, which offers a complementary perspective to other studies focused on the epicenter of the spill off the coast of Louisiana (Cope et al. 2013). By doing so, we can evaluate the full scope of an environmental disaster that affects multiple regions dependent on the environment for different industries (e.g., fishing and tourism); an important task for understanding large-scale disasters.

This case study is particularly apt for investigating the two mechanisms of community cohesion and environmental concern. Maintaining social cohesion becomes particularly difficult for cases of technological disasters, like the *Deepwater Horizon* oil spill, which tend to involve accidents or failures of technology as well as human-made manipulations of the natural environment (Gill and Picou 1998). In contrast to the social cohesion that is often generated following natural disasters and seen in people working together to rebuild (Barton 1969), technological disasters have been thought of as creating corrosive communities, where feelings of uncertainty, anger, and failure can lead to the collapse of basic trust in common social institutions entrusted to protect us from major disasters (Freudenburg 1997; Gill and Picou 1998).

We can also investigate concerns about environmental degradation in our chosen coastal locations. Alongside the oil spill, other environmental problems existed or emerged over the five-year recovery period of our study. For example, Apalachicola Bay (in Franklin County) is an exceptional estuary, recognized by the United Nations, that once grew prolific oysters providing ten percent of the nation's oyster supply (Camp et al. 2015). The National Oceanic and Atmospheric Administration declared a commercial fishery disaster for the oyster industry in Apalachicola in 2013, blaming excessive drought and pre-existing ecological stresses for the rapid decline in oyster harvests (NOAA 2013). The effects of water supply on oyster mortality was likely compounded by overharvesting taken in response to expected losses from the *Deepwater Horizon* oil spill and a lack of existing shell needed for rebuilding the oyster beds (Camp et al. 2015). The multiple environmental problems experienced in these coastal areas will allow us to assess how environmental concerns might affect perceptions of community recovery.

For this region of the Gulf Coast, the social, economic, and ecological effects of the spill persisted long after the wellhead was capped (Gill, Picou and Ritchie 2012; Parks et al. 2019). Claims for compensation for lost income and property damage continued to flood BP and later the Gulf Coast Claims Facility's offices through 2012, when all outstanding claims were transferred to the federal court system. In late 2014, terms for BP's Deepwater Horizon Business and Economic Loss Settlement Agreement were reached in the amount of \$20.8 billion to be paid to all public and private parties with compensation claims pending through June 2015 (Barrett 2015). Thus, by the five-year anniversary of the spill in 2015, most of the effects of the oil spill had been experienced and the opportunities to seek compensation for losses closed out—allowing the region to fully move into the recovery process.

Methods

To assess perceptions of recovery after the *Deepwater Horizon* oil spill, we conducted a telephone survey five years after the 2010 spill (April 1 through May 15, 2015) of 351 residents in Baldwin County, Alabama and Franklin County, Florida. These sites were part of an earlier, multisite investigation that showed declines to tourism or the fishing industry at the time of the spill, which proved useful baseline data for assessing recovery five years later (Morris et al. 2013). The two counties also offer a comparative purpose: Baldwin County experienced heavy to moderate oiling, while Franklin County had little to no oil (National Commission 2011).

The University of Florida Survey Research Center administered the survey through a random digit dialing cell phone sample in the designated counties. The survey center attempted to reach 7,126 numbers, with a majority of calls not reaching people due to disconnected or nonworking numbers, and no answer or answering machines (4,299 numbers). Of those who answered, 1,786 refused, 161 said they were busy or unavailable and 529 were ineligible.¹ The remaining 351 respondents (250 from Franklin County, Florida and 101 from Baldwin County, Alabama) who participated in the survey answered basic demographic questions, as well as questions about the effects of the oil spill for themselves and perceptions of their larger community, recovery from the oil spill for themselves and perceptions of their larger community, and an assortment of questions about attitudes and behavioral actions related to the spill, their community or the environment. Data collection was approved by the university's Institutional Review Board. Our response rate, at 6%, is relatively low, and is indicative of the modern challenges of trying to reach cell phones for survey research. One primary problem is lower contact rates, largely due to the common Caller ID technology on cellular phones that decreases the likelihood that someone will answer a call from a "Survey Research Center."²

Because we have a low response rate, we assessed the possibility for nonresponse bias in our sample by comparing our data to U.S. Census data for the two counties (see Table 1 for an overview of the traits of the respondents, as well as summary statistics of the variables used in the analysis). The data from our sample are fairly close to the average means from the 2015 American Community Survey for Baldwin and Franklin counties combined: percentage male (53.6% vs. 49.4%), percentage White (87.1% vs. 86.2%), and marital status being married (59.9% vs. 53.6%). Our data has a mean age of 50, compared to the median age of both Baldwin and Franklin Counties, 42. Our sample did include a higher percent of those with a college degree (37.9% vs. 28.2%). However, our sample also has a large number of respondents employed in the fishing industry (34%), showing that this key variable of interest, given the deleterious effects of oil spills on the fishing industry, is well-represented among respondents in our study.

Measures

Most of our measures were drawn from or adapted from the Community and Environment in Rural America (CERA) Gulf Coast Module. The CERA survey instruments were developed by a team of researchers at the Carsey Institute at the University of New Hampshire with consultation with the University of New Hampshire Survey Center, and the questions used come largely from prior research studies (Keirns 2011). Additionally, questionnaires were pre-tested with a randomly sampled segment of the study population and screened for questions that were difficult to answer (Keirns 2011). The CERA Gulf Module survey combined core questions from CERA with new questions that asked specifically about the Gulf oil spill and environment-related views (Hamilton, Safford and Ulrich 2012). Specifically, the environmental concern variables (Fishing Problems, Water

¹Ineligibilities included being under 18, being mentally/physically unable to take the survey, being an organization or business, or not speaking English. Also, cell phone numbers are an imperfect indicator of where people reside and anyone who did not live in the targeted zip codes were excluded.

²Response rate calculated using guidelines provided by the American Association of Public Opinion Research.

Problems, Climate Change), the community optimism variables (Better Place, Worse Place), Employment variables (Fishing Industry and Tourism Industry), and most demographic variables were drawn from the CERA Gulf Module. The wording of the helpful neighbors variable (Helpful neighbors) also came from CERA although we expanded it from a two point agree-disagree scale to a six-point agree-disagree scale. The CERA Gulf Module was administered in 2010 and did not assess long-term recovery, so we added questions to control for the oil spill's effects and assess perceptions of recovery five years later.

Dependent Variables—We examine perceptions of recovery at the community level across multiple arenas with a set of questions that asked respondents whether they thought their community had recovered from the oil spill on a scale of one (not at all) to six (completely) in four areas. The first was the economy, such as jobs or income (Recovery: Economic). The second was the environment, such as wildlife or scenic areas (Recovery: Environmental). The third was community relations, such as people caring about or helping each other (Recovery: Social). Finally, the fourth was physical health, such as health related problems due to the oil or dispersants (Recovery: Health).

Independent Variables—Our community-level independent variables of interest relate to *community cohesion* and *environmental concern*. Based on the extant literature's findings that social capital and cohesion are strong predictors of positive trajectories after a disaster, we include two measures of community cohesion. The first community cohesion variable (Helpful Neighbors) is operationalized through our survey question that asked respondents “thinking about the trust and cohesion in your community, do you agree or disagree: ‘people around here are willing to help their neighbors’” on a scale of one to six, with six being the strongest agreement with this statement. Following the work of social scientists like Erikson (1976) and Klinenberg (2015), we hypothesize that individuals who anticipate their communities could provide assistance in the event of a disaster should also rate their recovery from the oil spill as higher than those who feel that their communities are unable or unwilling to provide social support.

To capture more subjective interpretations of social cohesion, we also include a qualitatively-generated measure of community cohesiveness (Community Members' Help), which is based on our coding of an open-ended question that asked: “in one or two sentences, could you describe what feature of your community was best at helping you or your family recover from the BP oil spill?” We applied an open-coding technique of all responses to identify commonly listed sources of help and sorted them into these inductively-generated categories of assistance: community members/neighbors, BP, government, non-profit organization, church, family/friends, or some other source of help. We also coded if they specifically said they received no help, stated they were not affected by the spill, said they didn't know, refused to answer, or gave a response that was off-topic, usually about the state of their recovery rather than describing any sources of aid. Respondents could list multiple sources of support in a response.

Based on the qualitative coding of these responses, we generated a dichotomous variable for our statistical models for whether respondents mentioned “community members or neighbors” as a source of help or not, in their responses.³ If the respondent only mentioned

institutions (local government, churches, or civic groups) or close personal ties (family or friends) this was not coded as community members' help as the goal is to capture community cohesiveness and assistance generally, rather than personal social capital or access to resources through local organizations.

Environmental concern toward additional ecological threats was assessed using responses to a list of environmental issues that might be perceived as significant problems in some communities along the Gulf Coast, including the "loss of fishing jobs or income," "water supply problems;" and "global warming or climate change." Respondents were asked to rate each environmental problem (Fishing Problems, Water Problems, Climate Change) based on whether each had no effect, had minor effects, or had major effects on their family or community over the past five years (recoded into 1=major effects, 0=minor effects, no effect, or don't know). Here, we hypothesize that respondents who perceived higher levels of additional and ongoing ecological issues are less likely to positively assess their recovery from the oil spill.

Control Variables—To understand perceptions of recovery, we control for the extent of effects from the oil spill. Specifically, the survey asked respondents whether they thought the oil spill negatively affected their larger community in four ways (answer scales 1=not at all to 6=very strongly). The first was the economy, such as lost jobs or income (Oil Spill Effects: Economic). The second was the environment, such as harm to wildlife or scenic areas (Oil Spill Effects: Environmental). The third was community relations, such as a decrease in people caring about or helping each other (Oil Spill Effects: Social). Finally, the fourth was physical health (Oil Spill Effects: Health), such as health-related problems due to the oil or dispersants. We control for the particular effect that is relevant for understanding the recovery outcome in question; for example, in a model looking at community-level economic recovery, we would control for the extent to which a respondent felt the oil spill had affected the economic activity in his or her community in the first place.

We also include two control variables focused on optimism, which measure individuals' perceptions that their community is trending toward a better place, a worse place, or remaining the same ten years in the future. We hypothesize that optimistic assessment of their communities being a "better place" in ten years will be associated with perceptions of positive recoveries across each of our four dependent variables while pessimistic assessments that their community will be a "worse place" will be negatively correlated with views towards recovery. For these variables, the reference category is "about the same."

Additionally, we incorporated a number of demographic variables that may affect the vulnerability of individuals in weathering and rebuilding after disasters: age (in years), as well as the binary demographic variables of sex (Sex: 1=male, 0=female); respondent's state of residence (In Florida: 1=Florida, 0=Alabama); full or part-time employment in a fishing industry within the household (Fishing Industry: 1=works in fishing industry, 0=does not); and full or part-time employment in a tourism-related industry within the household

³Given the conceptual similarities across community assistance and helping behaviors, we tested for multicollinearity in our models and did not find it to be a problem (mean variance inflation factors were less than 1.5).

(Tourism Industry: 1=works in tourism industry, 0=does not). We also recoded the following variables into binary form, with one set equal to the presence of the variable: racially white (White); married (Married); total household income less than \$50,000 (Income<\$50,000); and being a college graduate (College Graduate). See Table 1 for more details on the demographic traits of the sample and other variables in the model.

Analysis

For the quantitative analysis, we analyzed the data using ordinary least squares regression to assess the outcome of perceptions of community recovery using Stata software (Stata/SE 15). List-wise deletion was used for missing data. Income, in particular, had a fair amount of missing data ($n=40$) and consequently it was only included in models where it significantly improved model fit.⁴ For the qualitative analysis, we engaged in inductive analyses incorporating phenomenological and grounded theory approaches (Creswell 2009; Glaser and Strauss 1967). We searched responses for commonalities in stated sources of help and developed a comprehensive list of all possible sources. We then refined and collapsed categories (such as combining family and friends to indicate personal networks) to narrow them down to the ones presented in the results. Our mixed-method approach allows us to combine the advantages of generalizability from the survey responses with the greater level of detail provided by respondents in open-ended questions to more fully assess the relationships between community cohesion and environmental concern on perceptions of community recovery.

Results

Five years after the spill, did Gulf Coast residents feel like they had recovered from the socio-ecological effects of the oil spill? Our results show that after those first five years, many residents still perceived their communities as struggling to recover (see Figure 1). In fact, a majority of respondents described their community's economy as either not at all, just a little, or only somewhat recovered ($n=201$, 57%). Perceptions of the community's environmental recovery also tended to be low, with again almost half ($n=168$, 49%) viewing the environment as not at all, just a little, or only somewhat recovered.⁵ Conversely, the community's social ties showed the most significant recovery with a majority viewing such social connections as moderately, mostly or completely recovered ($n=241$, 70%). Perceptions of community health followed a similar trend, with a small majority viewing the community as moderately, mostly or completely recovered ($n=183$, 55%). It is important to note though, that this still leaves large numbers feeling like the community has not recovered.

To gain a deeper insight into perceptions of community recovery, we also included an open-ended question asking what feature of their community was best at helping them or their family recover from the spill. Coded responses from this question provide important context for understanding the multiple features of community that respondents felt assisted in their personal recoveries. Some respondents specifically pointed to their community's

⁴Model fit evaluated using Wald tests. Income improved fit for only one model, community economic recovery.

⁵Percentages from total sample minus any missing data for the question.

civic sphere, identifying non-profit organizations (n=14, 4%) or churches (n=19, 6%) (see Table 2). A fair number mentioned the compensation and clean-up programs run by BP (n=35, 10%). Government, especially local government, was also mentioned in responses (n=28, 8%).

The most frequent answer provided by respondents was statements about how the members of the community or neighbors helped each other or worked together after the disaster (see Table 2 for a summary of the sources of help listed in responses). Common ways that respondents described this sentiment were: “everybody worked together,” “the community came together,” “tight knit small community,” “we take care of each other,” “neighbors getting out and helping each other,” and “everybody pitched in and helped.” Sometimes the community was specifically described as doing what formal routes could not, using statements such as “the local people, they all cared about each other because our government doesn’t care about us,” and “we helped ourselves—the community came together—not so much the help from agencies.” Ultimately, about a fifth of participants described such cohesion among community members following the open-ended prompt (n=66, 19%).

It is also relevant to note cases where community assistance did not occur. Experiencing quite the opposite of solidarity, some people responded by stating they received no help, such as: “we did it pretty much ourselves,” “didn’t have any help,” “we got no help, none—everyone has to take care of themselves,” and “nobody helped us.” This style of response was also a relatively common answer (n=49, 14%). These feelings of isolation also reflect variability in whether larger communities were viewed as a source of assistance, or not, in a time of need. As with most open-ended questions, there were a fair number of responses falling outside the category of form of community help, such as those who discussed the state of recovery or another topic instead (n=22, 6%), those who were asked the question but answered unsure or didn’t know (n=25, 7%), or those who had no answer for that or refused (n=16, 5%). Another subset stated they did not need help since they were not affected (n=38, 11%). Finally, there was a small amount of missing data for this question due to respondents not being asked the question after a pattern of refusals (n=11, 3% of our sample).

Next, we turn to the results of our regression analyses examining the effects of perceptions of community cohesion on participants’ assessments of post-disaster recovery in their communities (see Table 3). We find that perceptions that other community members are generally willing to help their neighbors has widespread effects on assessments of community recovery (Helpful Neighbors). The helpful neighbors variable significantly affected three out of four community recovery outcomes.

The open-ended coded measure of receiving community-based assistance following the spill is similar to the helpful neighbors variable in that it assesses perceptions of whether people look out for each other, but is specific to behaviors in the aftermath of the oil spill (Community Members’ Help). This variable did have significant, positive effects on community social recovery from the oil spill ($b=.54$, $p=.012$), but lacked the widespread effects of the more general neighbors helping each other variable.

Next, we turn to potential environmental factors affecting recovery. Of the general environmental concerns experienced in the past five years, only worries about the loss of fishing jobs yielded significant results. Concern about a declining fishing industry had pervasive effects, significantly decreasing perceptions of recovery in economic, environmental and social arenas. It also approached significance for the community health recovery variable ($b=-.47$, $p=.0502$). Perceptions of declines in fishing were particularly prominent in reducing assessments of environmental recovery ($b=-.53$, $p=.006$). This reflects how important the health of the seafood industry is in the regions we sampled. As one respondent explained in the open-ended community question, “we have not recovered. Our oyster beds are dying.” Other environmental threats are happening that slow the community’s ability to rebound from the disaster.

We also assessed employment, optimism, and demographic traits. One notable finding was that being employed in the tourism industry had positive effects on views of recovery across economic, environmental and social outcomes. Another interesting finding was that people located in Florida had more negative views of economic and environmental recovery, relative to their peers in Alabama. One community-focused variable with significant effects was whether the respondent thought that in ten years the community would be a better or worse place; while being optimistic did not have significant effects, being pessimistic did, negatively affecting perceptions of environmental recovery ($b=-.56$, $p=.005$).

Finally, we turn to the models themselves. There are some noteworthy differences. For example, while we were able to explain close to half of the variance in perceptions of economic recovery ($R^2=.49$) and environmental recovery ($R^2=.42$), we were only able to explain about a fourth of the variation in social recovery ($R^2=.26$) and even less than that for health recovery ($R^2=.17$). This is reflected in the number of significant predictors we find in each model; while the model for perceptions of environmental recovery has seven significant independent variables, the model for perceptions of health recovery has only two significant predictors. Thus, we understand what drives perceptions of environmental and economic recovery better than what affects perceptions of social and health recovery. This has ramifications for informing strategic efforts to improve different dimensions of community recovery; perceptions of health recovery, in particular, is the least understood, which makes it the hardest to address from a policy perspective.

Discussion

The study of post-disaster recovery remains relatively under-theorized in comparison to other stages in the disaster cycle (Olshansky, Hopkins and Johnson 2012). Rarely do studies of post-disaster recovery account for aspects of community such as collective perceptions of improvements or the persistence of damages beyond simple rates of infrastructure repair or economic growth. By surveying Gulf Coast residents on the five-year anniversary of the *Deepwater Horizon* disaster, we were able to observe distinct patterns of perceived recovery and their correlates in the longer term, including more holistic, macro-level traits such as social cohesion and ecosystem health.

Our findings reveal that respondents who lived in communities that they perceived as socially cohesive saw increased positive perceptions of recovery after the spill across a variety of domains (see positive regression coefficients for Helpful Neighbors in Table 3). Extant studies highlight the importance of attachment to place for disaster recovery, where community attributes from history and culture to music and food are essential elements of the social bonds that determine a strong sense of community and belonging (Chamlee-Wright and Storr 2009; Clarke and Mayer 2017; Cox and Perry 2011). We seek to contribute to this literature by demonstrating that how people feel about the helpfulness of social ties in a community — whether they see community members as providing reciprocal benefits — matters for perceptions of community recovery post-disaster. For disaster victims, experiencing the provision of social support after a disaster increases perceptions that support will be provided when needed in general, and such perceptions of reciprocation can then reduce psychological distress (Norris and Kaniasty 1996). Thus, receiving resources from one's neighbors matters, but ultimately individuals' perceptions of the availability of such support is the link that has long-term effects for reducing distress. Our findings extend these individual-level findings to the level of the community, where perceptions of access to supportive neighbors also increase evaluations of disaster recovery five years after the spill. Thus, communal ties collectively perceived to be robust and helpful may serve as a buffer against some of the social challenges that emerge post-disaster, especially in the case of technological disasters.

A sense of place also includes the valuation of ecosystem services, which are often directly threatened by disasters (Block et al. 2019; McKinzie 2019). The results from our study show that concern about environmental recovery featured prominently among Gulf Coast residents, with about half fearing that the coastal environment had recovered not at all, just a little, or somewhat (see Figure 1). These perceptions that the community continued to suffer from environmental damages and the related economic effects of lost fishing income negatively affected a number of recovery outcomes (see Table 3). Here, our findings reveal that worries about lingering environmental problems significantly reduced the likelihood that individuals considered their community to be recovering across almost all of our dimensions of post-disaster recovery. Further, while the survey's open-ended responses were not prompted specifically about the environment and a sense of place, some respondents did bring it up, particularly the loss of oystering. For example, one said, "our culture is based on [the] environment; they destroyed our environment." Another stated, "I used to shrimp and oyster and fish and everything. I used to make a lot of money in the bay and now I can't do that." These statements mirror the quantitative findings about the importance of loss of fishing to perceptions of community recovery. They also suggest the need to incorporate concerns about the natural environment alongside social components when looking at place attachment and disasters, especially given that connections between the environment and place attachment are less studied (Block et al. 2019).

We also sought to determine whether overall optimism towards the future of one's community would be a significant predictor towards perceptions of post-disaster recovery. Yet we found very little correlation between future-oriented optimism, compared to a neutral stance on the future, and our post-disaster recovery outcomes, although pessimism was negatively correlated with environmental recovery (see Table 3, *Community Optimism*).

Employment in the tourism industry proved to have pervasive effects in our analysis, increasing perceptions of recovery across most outcomes (see Table 3). While multiple industries rely on the environment, there are nuances and gradations when it comes to workers in those industries. Specifically, people employed in tourism were more likely to view recovery as positive. Tourism is dependent on outsiders viewing the environment as recovered to visit their beaches. Although some communities have a long history of fishing and oystering, many are witnessing a shift to tourism, potentially creating tension between the new and old ways of making a living (Gaither and Worthen 2010). One survey respondent even listed this as a source of help in the open-ended response, stating, “Tourism was beginning to supplement seafood harvesting at the time of the spill and that was the one feature that helped the community economically move along after the oil spill.” Here, we see the importance of understanding place, which is supported by the results indicating a much more negative view of environmental and economic recovery in the research site in Florida compared to the one in Alabama—a surprising finding given that the basic geographic distribution of oil-related damages was significantly greater in Alabama. Yet, while Baldwin County, Alabama works to restore growth in its tourism industry, the spill has triggered a moral crisis in Franklin County, Florida, which is caught between a swiftly deteriorating goal of restoring the past’s reliance on oyster harvesting and economic development interests promoting tourism.

Finally, in looking at perceptions of community recovery in the longer-term, we find that the effects of the oil spill persist. Particularly in the economic and environmental recovery domains, about half view little improvement in their communities. This is noteworthy, given that five years have elapsed and compensation programs and other funds have been implemented. The economic and environmental ramifications of the oil spill still endure (Parks et al. 2019). While disasters are often investigated as discrete occurrences, we recognize that socioeconomic and environmental crises can be chronic phenomena that are often exacerbated by catastrophic events. This is certainly true for the Gulf Coast region, which one of our community partners refers to as a place “in constant crisis occasionally punctuated by disaster.” This precarious setting is a context likely common to many vulnerable communities experiencing ongoing social and ecological threats from multigenerational poverty, climate change, natural resource extraction, and many others.

Conclusion

Our analyses of the long-term recovery process from the *Deepwater Horizon* oil spill suggests that scholars should take more seriously ideas related to community solidarity and concerns about the natural environment when evaluating rebuilding efforts. It also calls for stronger efforts to invest in community development post-disaster. Nearly all of the compensation funds provided by BP post-disaster went to cover individual and commercial financial losses. While municipal governments could seek compensation for spill-related expenditures and lost tax revenues, there was comparatively much less attention paid to the need for funding community-level interventions like establishing mental-health crisis centers or community-development programs (Mayer, Running and Bergstrand 2015). Although we would never argue about the immediate need to restore individuals, families, and local

businesses to pre-event conditions, current disaster recovery programs neglect the important role of community wellbeing to the detriment of all.

Increasingly, disaster scholars are looking to the effects of trust, social cohesion, and related measures of community resilience as important indicators of disaster preparedness. While our capacity to measure and estimate these phenomena is improving through the development of various indices (e.g. Cutter et al. 2008 or Norris et al. 2008), observing their effects on the trajectory of individuals, households, or communities in a post-disaster context remains understudied. As disaster scholars and practitioners continue to examine cases of post-disaster recovery, we believe that is essential to consider these community-level aspects of recovery in addition to the more traditional assessments of rates of home and infrastructure repair, resettlement, and physical or mental health morbidity.

The case of the *Deepwater Horizon* oil spill however, has several limitations in this regard. In comparison to the increasingly large hurricanes and storms affecting the same area in recent years, the *Deepwater Horizon* spill was much more of an economic crisis. Very few catastrophic effects occurred and thus our findings tend to emphasize long-term perspectives over short-term concerns of immediate restoration of basic services and shelter. Another important limitation of post-disaster survey work like our own is recall bias, especially in the context of a slow-moving disaster such as the *Deepwater Horizon* oil spill. Gulf Coast residents were forced to contend with daily reminders of the spill from billboards and media advertisements for legal representation and closed down businesses. This study also is limited in that it looks at perceptions of recovery and losses, rather than measurements of actual recovery and losses. While we think perceptions are important, especially for concepts like community cohesion and a sense of place, future research could collect data that connects perceptions with other measures of loss and recovery. We also recognize that there could be feedback effects in the models; for example, perceptions of how helpful your neighbors are could affect perceptions of social recovery after a disaster, but recovery of social ties, in turn, could influence your views on neighbors' helpfulness.

The results from this paper also highlight the danger of treating environmental harms as isolated incidents. A series of environmental problems creates a tricky landscape for recovery processes of all types. For towns economically reliant on healthy environments, as is the case for many coastal towns dependent on seafood and tourism industries, a deteriorating environment can signal more holistic decline. Researchers from the natural and social sciences could integrate measures of environmental quality with assessments of community cohesion to more fully understand attachment to place and disaster recovery. Like the community-level interventions noted above, our findings also provide a strong case of the need to direct disaster funding to the larger community, specifically in the form of programs that work to improve or preserve scenic areas and natural resource bases. This is especially important for coastal towns like the ones we studied that are economically dependent on fishing, oystering and tourism. Ensuring the environment is healthy enough to continue such traditions also contributes to community identity and attachment to place. For these reasons, sources of disaster funding should be strategic in allocating funds at both the individual and community levels, and consider both environmental and social outcomes.

Acknowledgements:

This project was funded by a grant from the National Institute of Environmental Health Sciences (U19ES020683) as part of the Deepwater Horizon Research Consortium.

References

- Albrecht G, Sartore GM, Connor L, Higginbotham N, Freeman S, Kelly B, Stain H, Tonna A, and Pollard G. 2007. Solastalgia: The distress caused by environmental change. *Australasian Psychiatry*15: S95–S98. [PubMed: 18027145]
- Barrett D2015. U.S., BP finalize \$20.8 billion Deepwater Oil spill settlement. *The Wall Street Journal*, 105. <https://www.wsj.com/articles/u-s-says-20-8-billion-bp-spill-settlement-finalized-1444058619> (accessed 22 August 2019).
- Barton AH1969. *Communities in disaster: A sociological analysis of collective stress situations*. Garden City, NY: Doubleday.
- Beggs J, Haines VA, and Hurlbert JS. 1996. The effects of personal network and local community contexts on the receipt of formal aid during disaster recovery. *International Journal of Mass Emergencies and Disasters*14:57–78.
- Birkland TA1997. *After disaster: Agenda setting, public policy, and focusing events*. Washington D.C.: Georgetown University Press.
- Block K, Molyneaux R, Gibbs L, N.A., Baker E, MacDougall C, Ireton G, and Forbes D2019. The role of the natural environment in disaster recovery: We live here because we love the bush. *Health & Place*57:61–69. [PubMed: 30981069]
- Brown BA and Perkins DD. 1992. Disruptions in place attachment. In *Place attachment*, eds Altman I and Low SM, pp. 279–304. New York: Plenum Press.
- Buckner J1988. The development of an instrument to measure neighborhood cohesion. *American Journal of Community Psychology*16(6):771–791.
- Camp EV, Pine III WE, Havens K, Kane AS, Walters CJ, Irani T, Lindsey AB, and Morris JG Jr. 2015. Collapse of a historic oyster fishery: Diagnosing causes and identifying paths toward increased resilience. *Ecology and Society*20(3): 45.
- Chamlee-Wright E, and Storr VH. 2009. There's no place like New Orleans: Sense of place and community recovery in the Ninth Ward after Hurricane Katrina. *Journal of Urban Affairs*31(5): 615–634.
- Chamlee-Wright E, and Storr VH. 2011. Social capital as collective narratives and post-disaster community recovery. *The Sociological Review*59(2): 266–282.
- Clarke HE, and Mayer B. 2017. Community recovery following the Deepwater Horizon Oil Spill: Toward a theory of cultural resilience. *Society & Natural Resources*30(2): 129–144. [PubMed: 29104368]
- Cope MR, Slack T, Blanchard TC, and Lee MR. 2013. Does time heal all wounds? Community attachment, natural resource employment, and health impacts in the wake of the BP Deepwater Horizon disaster. *Social Science Research*42 (3): 872–81. [PubMed: 23522000]
- Cox RS, and Elah Perry KM. 2011. Like a fish out of water: Reconsidering disaster recovery and the role of place and social capital in community disaster resilience. *American Journal of Community Psychology*48(3–4): 395–411. [PubMed: 21287261]
- Creswell JW2009. *Research design: Qualitative, quantitative, and mixed methods approaches*, 3rd edition. Thousand Oaks, CA: Sage.
- Cunsolo A, and Ellis NR. 2018. Ecological grief as a mental health response to climate change-related loss. *Nature Climate Change*8(4): 275–281.
- Cutter SL, Barnes L, Berry M, Burton C, Evans E, Tate E, and Webb J. 2008. A place-based model for understanding community resilience to natural disasters. *Global Environmental Change*18(4): 598–606.
- Cutter SL, Boruff BJ, and Shirley WL. 2003. Social vulnerability to environmental hazards. *Social Science Quarterly*84(2): 242–261.

- Enarson E and Morrow BH. 1997. A gendered perspective: The voices of women. In Hurricane Andrew: ethnicity, gender and the sociology of disasters, eds. Peacock WG, Morrow BH and Gladwin H, pp. 116–140. New York: Routledge.
- Erikson K1976. Everything in its path: Destruction of community in the Buffalo Creek flood. New York: Simon and Schuster.
- Flint CG, and Luloff AE. 2005. Natural resource-based communities, risk, and disaster: An intersection of theories. *Society and Natural Resources*18(5):399–412.
- Freudenburg WR1997. Contamination, corrosion, and the social order: An overview. *Current Sociology*45: 19–39.
- Gaither CJ, and Worthen HD. 2010. The influence of race and class on resident response to economic restructuring in Franklin County, Florida, USA. *Social & Cultural Geography*11(5):451–474.
- Gill DA and Picou JS. 1998. Technological disaster and chronic community stress. *Society and Natural Resources* 11: 795–815.
- Gill DA, Picou JS, and Ritchie LA. 2012. The Exxon Valdez and BP Oil spills: A comparison of initial social and psychological impacts. *American Behavioral Scientist*56(1): 3–23.
- Gill DA, Ritchie LA, and Picou JS. 2016. Sociocultural and psychosocial impacts of the Exxon Valdez Oil spill: Twenty-four years of research in Cordova, Alaska. *The Extractive Industries and Society*3(4): 1105–1116.
- Glaser B, and Strauss A. 1967. *The Discovery of Grounded Theory: Strategies for Qualitative Inquiry*. Piscataway, NJ: Transaction Publishers.
- Hamilton LC, Safford TG, and Ulrich JD. 2012. In the wake of the spill: Environmental views along the Gulf Coast. *Social Science Quarterly*93(4): 1053–1064.
- Jorgensen BS, and Stedman RC. 2006. A comparative analysis of predictors of sense of place dimensions: Attachment to, dependence on, and identification with lakeshore properties. *Journal of Environmental Management*79(3):316–327. [PubMed: 16288828]
- Keirns T2011. Community and environment in rural America (CERA) survey: Technical report. The Carsey Institute, University of New Hampshire.
- Klinenberg E2015. *Heat wave: A social autopsy of disaster in Chicago*. Chicago, IL: University of Chicago Press.
- Knez I, Butler A, Sang ÅO, Ångman E, Sarlöv-Herlin I, and Åkerskog A. 2018. Before and after a natural disaster: Disruption in emotion component of place-identity and wellbeing. *Journal of Environmental Psychology*55:11–17.
- Kroll-Smith S and Couch SR. 1990. *The real disaster is above ground: A mine fire and social conflict*. Lexington, KY: University Press of Kentucky.
- Kulig J, Edge D and Joyce B. 2008. Understanding community resiliency in rural communities through multimethod research. *Journal of Rural and Community Development* 3(3):77–94.
- Kulig JC, Edge DS, Townshend I, Lightfoot N, and Reimer W. 2013. Community resiliency: Emerging theoretical insights. *Journal of Community Psychology*41(6):758–775.
- Mayer B, Running K, and Bergstrand K. 2015. Compensation and community corrosion: Perceived inequalities, social comparisons, and competition following the Deepwater Horizon oil spill. *Sociological Forum*30(2): 369–390. [PubMed: 26120247]
- McKendree M, Ortega DL, Olynk Widmar N, and Wang HH. 2013. Consumer perceptions of seafood industries in the wake of the Deepwater Horizon oil spill and Fukushima Daiichi nuclear disaster. No. 1099–2016-89259. <https://ageconsearch.umn.edu/record/155582/> (accessed 31 August 2019).
- McKinzie AE2019. You don't miss it 'til it's gone: Insecurity, place, and the social construction of the environment. *Environmental Sociology Online* first: 1–11.
- Morris JG Jr, Grattan LM, Mayer BM, and Blackburn JK. 2013. Psychological responses and resilience of people and communities impacted by the Deepwater Horizon oil spill. *Transactions of the American Clinical and Climatological Association*124: 191–201. [PubMed: 23874022]
- National Commission on the BP Deepwater Horizon Oil Spill. 2011. *Deep water: The gulf oil disaster and the future of offshore drilling*. Washington, DC:U.S. Government Printing Office.

- National Oceanic and Atmospheric Administration. 2013. Commerce Secretary Pritzker declares fisheries disaster for Florida oyster industry. <https://www.noaa.gov/commerce-secretary-pritzker-declares-fisheries-disaster-florida-oyster-fishery> (accessed 22 August 2019).
- Nixon Z, Zengel S, Baker M, Steinhoff M, Fricano G, Rouhani S, and Michel J. 2016. Shoreline oiling from the Deepwater Horizon oil spill. *Marine Pollution Bulletin* 107(1): 170–178. [PubMed: 27098990]
- Norris FH, and Kaniasty K. 1996. Received and perceived social support in times of stress: A test of the social support deterioration deterrence model. *Journal of Personality and Social Psychology* 71(3): 498–511. [PubMed: 8831159]
- Norris FH, Stevens SP, Pfefferbaum B, Wyche KF, and Pfefferbaum RL. 2008. Community resilience as a metaphor, theory, set of capacities, and strategy for disaster readiness. *American Journal Of Community Psychology* 41(1–2):127–150. [PubMed: 18157631]
- Olshansky RB, Hopkins LD, and Johnson LA. 2012. Disaster and recovery: Processes compressed in time. *Natural Hazards Review* 13(3):173–178.
- Parks V, Slack T, Ramchand R, Drakeford L, Finucane ML, and Lee MR. 2019. Fishing households, social support, and depression after the Deepwater Horizon oil spill. *Rural Sociology*: 1–24.
- Pomeroy RS, Ratner BD, Hall SJ, Pimoljinda J, and Vivekanandan V. 2006. Coping with disaster: Rehabilitating coastal livelihoods and communities. *Marine Policy* 30(6):786–793.
- Reimer B, Kulig J, Edge D, Lightfoot N, and Townshend I. 2012. The Lost Creek Fire: Managing social relations under disaster conditions. *Disasters* 37(2):317–332. [PubMed: 23278276]
- Sherrieb K, Norris FH, and Galea S. 2010. Measuring capacities for community resilience. *Social Indicators Research* 99(2): 227–247.
- Smith LC, Smith M, and Ashcroft P. 2011. Analysis of environmental and economic damages from British Petroleum's Deepwater Horizon oil spill. *Albany Law Review* 74(1): 563–585.
- Srinivas H, and Nakagawa Y. 2008. Environmental implications for disaster preparedness: lessons learnt from the Indian Ocean Tsunami. *Journal of Environmental Management* 89(1): 4–13. [PubMed: 17904271]
- Townshend I, Awosoga O, Kulig J, and Yan Fan H. 2015. Social cohesion and resilience across communities that have experienced a disaster. *Natural Hazards* 76(2): 913–938.
- Urquhart J, and Acott T. 2014. A sense of place in cultural ecosystem services: The case of Cornish fishing communities. *Society & Natural Resources* 27(1):3–19.

Figure 1.
Perceived Level of Community Recovery Across Arenas (% of respondents)

Table 1.

Descriptive Statistics for Variables Used in Analysis

Variable	Mean (SD) or %
<i>Community Cohesion</i>	
Helpful Neighbors	5.16 (1.10)
Community Members Helped in Spill	19.41%
<i>Environmental Concern</i>	
Fishing Problems	75.78%
Water Problems	31.81%
Climate Change	15.76%
<i>Employment</i>	
Works in Fishing Industry	34.19%
Works in Tourism Industry	38.86%
<i>Community Optimism</i>	
Better Place	39.18%
Worse Place	18.71%
<i>Demographics</i>	
Age	50.37 (16.38)
Sex (1=Male)	53.56%
College Graduate	37.89%
White	87.07%
Married	59.94%
Income: Less than \$50,000	54.98%
In Florida (1=FL, 0=AL)	71.23%
<i>Community Effects</i>	
Oil Spill Effects: Economic	5.04 (1.44)
Oil Spill Effects: Environmental	4.32 (1.75)
Oil Spill Effects: Social	3.14 (1.90)
Oil Spill Effects: Health	3.15 (1.91)
<i>Community Recovery</i>	
Recovery: Economic	3.34 (1.67)
Recovery: Environmental	3.59 (1.62)
Recovery: Social	4.26 (1.60)
Recovery: Health	3.72 (1.74)

Table 2.

Frequency of Sources of Help Listed in Open-Ended Responses

	N	Percent
Community Members/Neighbors	66	19.41
BP	35	10.29
Government	28	8.24
Off Topic	22	6.47
Church	19	5.59
Nonprofit	14	4.12
Family/Friends	10	2.94
Some Other Source of Help	40	11.76
No Help	49	14.41
Not Affected	38	11.18
Don't Know	25	7.35
Refused	16	4.71
Total	340	

Table 3.

OLS Regression Predicting Perceived Aspects of Community Recovery

	Model 1: Economic		Model 2: Environmental		Model 3: Social		Model 4: Health	
Community Cohesion								
Helpful								
Neighbors	0.09	(0.07)	0.14 *	(0.07)	0.36 ***	(0.08)	0.28 **	(0.09)
Community								
Members' Help	0.08	(0.20)	0.12	(0.19)	0.54 *	(0.21)	−0.05	(0.24)
Environmental Concern								
Fishing Problems	−0.43 *	(0.22)	−0.53 **	(0.19)	−0.40 *	(0.20)	−0.47 +	(0.24)
Water Problems	−0.21	(0.17)	0.07	(0.17)	0.07	(0.19)	0.12	(0.22)
Climate Change	−0.02	(0.20)	−0.22	(0.20)	−0.29	(0.22)	−0.26	(0.26)
Employment								
Fishing Industry	−0.25	(0.18)	−0.21	(0.17)	−0.08	(0.19)	0.06	(0.23)
Tourism Industry	0.41 **	(0.16)	0.32 *	(0.16)	0.46 **	(0.17)	0.31	(0.20)
Community Optimism								
Better Place	−0.12	(0.17)	−0.03	(0.16)	0.21	(0.18)	0.24	(0.21)
Worse Place	−0.29	(0.21)	−0.56 **	(0.20)	0.01	(0.23)	−0.28	(0.27)
Demographics								
Age	0.01 *	(0.01)	0.01 *	(0.00)	0.01 +	(0.01)	0.01	(0.01)
Sex	0.33 *	(0.15)	0.16	(0.15)	−0.12	(0.16)	−0.29	(0.19)
College Graduate	0.04	(0.18)	0.15	(0.15)	0.09	(0.17)	0.15	(0.20)
White	0.20	(0.22)	0.16	(0.22)	0.45 +	(0.24)	0.43	(0.29)
Married	−0.10	(0.16)	−0.05	(0.15)	0.18	(0.17)	−0.23	(0.19)
In Florida	−1.15 ***	(0.19)	−0.68 ***	(0.18)	−0.36 +	(0.20)	−0.41 +	(0.24)
Income<\$50,000	0.16 *	(0.06)						
Oil Spill Effect								
Economic	−0.52 ***	(.07)						
Environmental			−0.46 ***	(0.05)				
Social					−0.20 ***	(0.05)		
Health							−0.22 ***	(0.06)
Constant	5.43 ***	(0.61)	5.08 ***	(0.55)	2.33 ***	(0.58)	2.92 ***	(0.69)
N	287		314		313		297	
R ²	0.49		0.42		0.26		0.17	

Notes: Standard errors in parentheses. Unstandardized coefficients are presented.

+ p<.10,

* p<.05,

** p<.01,

p<.001. Two-tailed tests. Adjusted R².

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript