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PERCEPTIONS OF THE RHODE ISLAND OIL SPILL

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Introduction

On January 19, 1996, an intense winter storm off the southern coast of Rhode Island drove the barge *North Cape* ashore adjacent to a National Wildlife Refuge. Damaged from the grounding, the barge spilled at least 828,000 gallons of heating oil, which rapidly spread to the coastal ocean. Within hours of the spill, dead marine organisms and sea birds began washing up on the beach. It quickly became the largest oil spill in the history of Rhode Island.

The coastal environment impacted by the *North Cape* spill is at the heart of the recreational and commercial fishing industries of Rhode Island. These industries are vital to the economy and lifestyle of southern Rhode Island, and the natural resources of the coast are a key draw for summer visitors. Residents are dependent upon these renewable natural resources for fishing, boating, and hiking, as well as for economic pursuits, such as commercial fishing, seafood restaurants, nature tours, and charter boat operations.

Pursuing a lifestyle and economy based on utilization of renewable natural resources is the basis for the Natural Resource Community (NRC) (Dyer, Picou, and Gill, 1992). Central features of NRC populations are a strong connection with space - a given geographic location and its component biophysical features - and the development of a folk knowledge, or resident natural history, of the resource cycles, development processes, and potential hazards of the local environment. The depth of knowledge of the environment in an NRC correlates with the degree of dependence on the resource. For example, a community solely dependent on fishing has a better understanding of their local marine environment than one which is dependent on tourism. Dependence on local natural resources can shape cultural values, social networks, and occupational roles to such an extent that loss of the natural resource base can have profound community impacts (Dyer,

1993; Picou et al., 1992).
Disaster events such as the *North Cape* oil spill threaten natural resources, and thus can impact the human communities that rely on such resources. This analysis contrasts the perceptions of individuals living near the disaster site with those living at the opposite end of the state. Does the NRC only apply to individuals living at the shore and economically dependent upon the resource? Will others at some distance perceive the spill in the same manner?

The Event

Most refined petroleum products reach New England by water. Block Island Sound, the area of the *North Cape* spill, lies in the path of coastwise oil transportation from New York to points north and east. In addition, imported oil products enter Narragansett Bay just to the east of Point Judith. Thus, large volumes of oil are continuously transiting this coast. The tug, *Scandia*, an unmanned barge, and *North Cape*, which contained 3.9 million gallons of home heating oil, were on a coastal trip from New York to Providence on January 19, 1996. Intense southerly winds and an approaching front were forecast for that day. While traversing the relatively protected waters of Long Island Sound, the tug apparently experienced some engine problems.
Continuing eastward, the *Scandia* and tow reached the unprotected area of Block Island Sound. In early to mid-afternoon, winds were reported at 60 mph from the south-southeast, and seas were running 15 to 20 feet (NOAA, 1996). A fire in the engine room was observed when the vessel was a few miles from Point Judith. After a distress call, the crew abandoned the tug, which by then was engulfed in flames. The Coast Guard responded and rescued the crew from the water. At that point, barge and tug drifted toward the coast subject to wind and tide. Two men were placed on the barge during the late afternoon and attempted to anchor it. That effort failed because the anchor could not be readily released, and the men were recovered as wind and wave conditions worsened. By early evening on January 19, the tug and barge were

aground on a barrier a beach adjacent to a wildlife refuge in southern Rhode Island (Table 1).

Table 1. Chronology of Events for the *North Cape* Spill, 1996

Date	Event
1/19	Barge Grounded.
1/20	Ponds closed to shellfishing. Lobsters, starfish, and clams begin to wash ashore.
1/21	Initial offshore ban - 105 square miles.
1/23	Fishing ban expanded to 250 square miles.
1/26	Barge removed.
1/28	Command Center closes.
1/31	Seafood sales slump/accident blamed on lack of dredging.
2/1	Massive die-off of amphipods in Card Pond noticed.
2/13	Tug removed.
2/20	Recreational fishing decline estimated at 80%.
2/21	Modified gear hauling, use of water and finfish, and lobster ban.
3/26	Portions of closed area now reopened to selected gear.
4/11	Ocean areas open to fin and shellfishing, except for lobstering. Piping plovers arrive at spill site.
6/5	Lobster closure area reduced in size.

The morning following the grounding, we visited the beach, observed the oil, and photographed some of the first marine organism casualties of the spill. In the following days, the magnitude of the event became known. First, 828,000 gallons of oil was reported lost from the barge by the Coast Guard. Second, as this oil spread from Block Island Sound toward Rhode Island Sound and Narragansett Bay, it forced the closure

for fishing of 250 square miles of ocean. Coastal ponds were also closed to fishing due to suspected contamination, and lobsters held in tanks onshore were also contaminated or killed by oil entering intake valves. In succeeding weeks and months, a variety of investigations were initiated under the provisions of the Oil Pollution Act, and initial results have been documented (NOAA, 1996). Massive kills of juvenile lobsters had been observed on the beach, and fishery closures remained in place. By late March, portions of the closed area were reopened to selected fishing gears, but the inshore area remained closed to lobstering. Investigation of effects on the natural environment was pursued after the spill. However, socioeconomic activities were virtually ignored, and are discussed in only one page of an 85-page report (NOAA, 1996). Thus, community impacts that follow and may increase in magnitude after a technological disaster - known as secondary disasters - were neither acknowledged nor investigated by the various agencies assigned to mitigate the spill event.

Methodology

A comparative assessment of the event was achieved by selecting two communities - one in proximity to the spill event, the village of Snug Harbor in South Kingstown, and one at a distance from the event, Pawtucket, Rhode Island.

The basic measurement tool was a standardized survey that includes descriptive sections on demographics, relationship of respondents to local natural resources, activities in relation to the spill, and perceptions of impact to community resources and local environment. The section on perceptions consists of a five-point scale. In this report, we concentrate on questions specific to perceptions of the spill event. The survey instrument was field tested and edited before being finalized.

A random household survey was conducted in February and March of 1996. Sampling was conducted on weekends to increase the probability of finding residents at home. Although exact figures were not kept, an estimated turn-down rate of 10% was encountered in Snug Harbor and

20% in Pawtucket. The higher turndown rate in Pawtucket could be related to recent burglaries in the neighborhood, which heightened resident suspicions of outsiders. Field conditions were made difficult by snow storms and cold temperatures.

Questionnaires were attached to clipboards and protected with plastic bags. To facilitate the rapid collection of data, questionnaires were left with heads of households, and then picked up usually within an hour. So as not to be overly intrusive, respondents were given the option of leaving the completed questionnaires inside their storm doors for pickup. Secondary data was also collected from newspaper accounts and other public documents on oil spill impacts and legislative action regarding barge safety.

The Two Communities

The questionnaire was designed to capture basic demographic characteristics of sample populations of Pawtucket (N=47) and Snug Harbor (N=52), their connection to the coastal resource base, involvement in spill issues, and understanding of spill impacts. The average age of respondents in Pawtucket was 50+ years, with a median age of 46. Of these, 47% were males, and 51% females. In Snug Harbor, average age of respondents was 58, with a median value of 49 years. Of these, 44% were males, and 56% females. Of the males in Snug Harbor, 35% (8 out of 23) engaged in commercial fishing.

Snug Harbor is located in South Kingstown near the sea. In the twentieth century, farming, fishing, and the small mills of South Kingstown have been augmented by a growing university and increasing summer population (Rhode Island Historical Preservation Commission, 1984). Most recently, the community has experienced suburban growth. The Snug Harbor section of town is located on a salt pond that opens to the ocean and has boat yards and other marine businesses. Residents were so close to the spill that some observed that their decorative house flags were discolored by diesel fumes, whereas others could clearly smell the oil in the air.

Pawtucket is just 41 miles inland from the accident and located north of Providence, Rhode Island. The first water-powered cotton mill in America was located there in 1789 (McLoughlin, 1978). Today, the city is urban and industrial. From the appearance of some of the residences, the neighborhoods we surveyed in Pawtucket appeared to have smaller lots and houses than Snug Harbor, reflecting differences in socioeconomic status.

Results

Frequencies in Table 2 show that both communities share comparable opinions about the spill event in spite of geographic separation and disparate cultural settings. Both perceive serious damage to the fisheries and a serious threat to the local economy. They are somewhat ambivalent about the accident itself, which they deem a consequence of oil transportation. They recognize another spill will occur, and they are willing to ban barges that create such spills.

Table 2. Comparative Responses of Two Natural Resource Communities to the *North Cape* Oil Spill

PA=Pawtucket; SN=Snug Harbor; SA=Strongly Agree; A=Agree; N=Neutral; D=Disagree; SD=Strongly Disagree

Response Scale	SA	A	N	D	SD
Communities	PA/SN	PA/SN	PA/SN	PA/SN	PA/SN
The North Cape Spill is just one of those					

accidents which happen when we transport oil by sea.	13.0/7.7	32.6/34.6	6.5/3.8	21.7/25.0	26.1/28.8
The oil spill does not pose a serious threat to the local economy.	4.3/5.9	8.7/5.9	4.3/3.9	28.3/23.5	54.3/60.8
Another oil spill will never occur in my lifetime.	---/1.9	4.3/2.1	2.2/7.7	50.0/42.3	43.5/44.2
The *North Cape* oil spill has seriously damaged local fisheries, such as lobster.	37.0/57.7	41.3/19.2	15.2/13.5	6.5/5.8	---/3.8
If barges cannot navigate Rhode Island waters without creating oil spills, then they should be banned from doing so.	37.0/50.0	30.4/21.2	21.7/15.7	10.9/9.8	---/2.0

Mann Whitney U was used to test the apparent similarity of the responses. The responses in Table 2 were converted to a 1-to-5 scale, with 5 being the perception that represents the greatest need to protect the environment. Total scores for each individual were computed and ranked, with the result that the sum of ranks from Pawtucket (n=42) was 2089.5, while in Snug Harbor (n=52) it was 2373.5, which result in a U of 997.5. A sampling distribution mean of 1092 and standard deviation of 131.49 result in Z (obtained) of -0.719. When alpha is set at 0.05 Z

(critical) becomes plus or minus 1.96. Therefore, we conclude that the perceptions of the residents of Pawtucket and Snug Harbor are not significantly different.

In summary, responses to these questions indicate communities separated by geographic distance, and disparate resource use patterns share a common bond about the threat to a valued resource. We propose that this may be explained in two ways. First, the communities have common knowledge through their direct experience with the resource. Many Pawtucket residents are familiar with the Southern Rhode Island coast. Thirty-one out of 47 who answered, or 66%, had spent at least part of every summer in recreational activities on the southern coast of Rhode Island. In response to the question, "How many summers over the last ten years have you spent in this community?", the mean was nine, with a median of 10 years. Recreational activities most important to Pawtucket residents included beach activities (listed most important by 57.9%), followed by swimming (42.4%), recreational fishing (26%), golf (18.4%), and clamming (7.9%). Based on these responses, Pawtucket extensively utilizes coastal resources during the summer tourist season. In some dimensions of use, the Pawtucket residents may be significantly dependent on the coastal and marine resources of southern Rhode Island. However, the Pawtucket residents do not use the resources during winter months when the spill and survey occurred.

Second, media coverage provided a basis of common knowledge in the two communities about the event. Ninety-eight percent of the residents in Snug Harbor believe that they closely followed news of the spill. In Pawtucket, 83% of the respondents indicated likewise. In both communities, respondents were asked to rank the reliability of information obtained from various sources. Among the top-ranked information sources were family and/or friends in the area, television and/or radio reports, and the local university. This information represents a shared resource for NRC community residents which shaped the common perceptions reported in Table 2. Furthermore, these information links have apparently amplified the risk associated with the oil spill so that inland residents perceive the threat in a manner similar to those who could smell the oil as it was spilled. This concept of the social

amplification of risk has been explored by Kasperson et al. (1988). In this context, risk amplification has enlarged the affected natural resource community, as measured by perceptions, so that urban inland residents view the event similarly to individuals living near, and apparently more dependent upon, the coastal resources impacted.

Conclusion

Natural resource communities have been demonstrated to be socially, psychologically, culturally, and economically vulnerable to the impacts of disasters that threaten their resource base (Dyer, 1993; Picou et al., 1992). This preliminary study on the *North Cape* spill indicates that communities that are seasonally connected to resources, even though not geographically proximate, can also perceive threats to resources at levels equal to those living near the resource base. Dyer (1996) demonstrated in an assessment of postdisaster assistance after Hurricane Andrew that the impacts of a disaster can affect communities outside the impact area, causing permanent social and economic dislocation and change. For the *North Cape* spill, it is still too early to determine what permanent impacts (if any) will be experienced to communities at some geographic distance. Initial data does reveal a level of shared importance placed on coastal recreational resources by local residents and seasonal users. This does not mean an equal level of dependence across all parameters. For example, the economic viability of Pawtucket residents is not threatened by an oil spill on the coast of Rhode Island. However, their seasonal use of the coastal resources is part of a lifestyle pattern that provides psychosocial and recreational capital that is not readily replaced. Loss of such capital can diminish the quality of life of community residents and could eventually lead to other costs associated with replacing such capital, as well as the trauma associated with disrupting a long-standing seasonal recreational pattern. This inland community represents an NRC of a different sort - one that is recreationally dependent on the coastal environment. In this analysis, the combination of summer visitation to the resource and media exposure to

the disaster caused Pawtucket residents to perceive the spill similarly to Snug Harbor residents. Thus, due to some experience with the resource and common information about the spill, Pawtucket residents form a recreational NRC with many of the elements of the geographically adjacent NRC. This is reflected in their perception of the oil spill as an "accident," the threat of another spill, damage to lobster fishers, and the agreement that barges susceptible to spills should be banned from Rhode Island coasts. Seasonality of resources use and subsequent vulnerability to disaster events is highlighted here as an important characteristic of NRC community types, with the identification of the "recreational NRC" as a newly recognized community variant.

In the NRCs of Alaska impacted by the *Exxon Valdez* oil spill, loss of tradition was a secondary result (Dyer, 1992). The potential for recreational NRCs of Rhode Island to be similarly affected by tradition loss, in this case related to summer recreational patterns, does exist. If this or subsequent oil spills were to cause tradition loss in this recreational NRC, substantial economic adjustments in Snug Harbor businesses would result.

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