



Research & Development Needs For Addressing the Human Dimensions of Oil Spills

Coastal Response Research Center
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FOREWORD

In June 2006, the Coastal Response Research Center (CRRC) held the “Workshop on Research Needs: Human Dimensions of Oil Spill Response” that included spill response practitioners and researchers from the social sciences in a discussion on risk communication, coordination in spill response and restoration, environmental ethics, valuing natural resources, and the social impacts of spills on communities and subsistence peoples. This workshop was the first of its kind to address these issues, despite the recent examples of spill response that was deemed unsuccessful, not on scientific merits, but on those related to the human perceptions of the effectiveness of the response.

Almost every spill affects humans in the short and long terms. Risks to resources, human health and community assets (e.g., beaches, shoreline) must be communicated to the public in an effective manner. Human interactions during spill response and restoration must also be coordinated in order to avoid conflict and errors (e.g., communications between spill responders). Social impacts of spills can hamper recovery and restoration, if not addressed. Natural resources affected by the spill must be valued properly to compensate impacted parties in a fair manner. People whose existence is strongly linked to subsistence activities (e.g., fishing) must be informed of the ramifications of the spill and work to minimize disruption to their lives. Environmental ethics must be at the forefront of any spill response and recovery plan.

The major goal of this workshop was to bring the oil spill community and other experts in related fields together to determine the state-of-practice and research needs in the area of human dimensions.

The Coastal Response Research Center, a partnership between the National Oceanic and Atmospheric Administration (NOAA) Office of Response and Restoration (OR&R) and the University of New Hampshire (UNH), develops new approaches to spill response and restoration through research and synthesis of information. The Center’s mission requires that it serve as a hub for research, development, and technology transfer to the oil spill community.

From 2007 on, the Center is focusing the research it supports on three topics, chosen in concert with OR&R and approved by the Center Advisory Board: dispersant use; submerged oil; and oil-in-ice. Within each topic, there will be three areas of research emphasis: injury assessment; integrated modeling and ocean observing; and **human dimensions** (Figure 1).

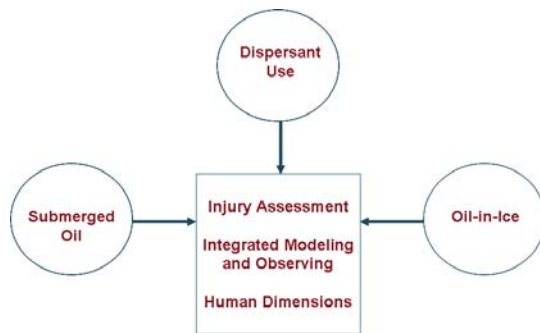


Figure 1. CRRC Priority Topics and Areas of Research Emphasis.

The Center's first research needs workshop in November 2003 clearly identified the human dimensions of spills as a major, but frequently overlooked issue. The Center has had human dimensions related topics featured in its subsequent RFPs since 2004. This has resulted in random utility and benefit transfer models, analysis of stakeholder objectives and social disruption from spills and spill response, and analysis of restoration scales effectiveness.

This report summarizes the information and discussion from 40 individuals who attended the workshop. It outlines the broad research topics that can serve as the basis for RFPs on human dimension issues.

We hope you enjoy reading the report and exploring the topics. If you have any comments, please contact the Center. The Center looks forward to many more similar endeavors during the coming years where it can be of service to the oil spill community and the nation.

Sincerely,



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Table of Contents

Foreword.....	2
I. Background and Introduction	5
II. Workshop Organization and Structure	7
III. Scoping of Human Dimensions Issues into Suggested Research Topics	8
IV. Workshop Results	11
A. Risk Communication Projects	12
B. Valuing Natural Resources Projects	15
C. Social Impacts Projects	18
D. Subsistence Projects	21
E. Coordination in Response and Restoration Projects	24
F. Environmental Ethics Projects	28
V. Workshop Summary	33
VI. Conclusions	36
VII. References	37

Appendices:

- A: Participant List
- B: Workshop Agenda
- C: Organizing Committee Members

I. Background and Introduction

The human dimensions of oil spill preparedness, response, assessment, and restoration are integral to implementing the National Oceanic and Atmospheric Administration's (NOAA) mandate, as the trustee agency for coastal resources under the Oil Pollution Act of 1990 (OPA 90), to prevent damage to the environment, respond to incidents to minimize environmental harm, and restore degraded resources to promote public health and societal well being. These responsibilities require coordinated decision making and action across a broad spectrum of spill responders, impacted communities, regulators, responsible parties, and researchers to define, implement, and evaluate response and restoration priorities. Incidents such as the *Exxon Valdez* and *Selendang Ayu* demonstrate the need for substantial, coordinated national investment in human dimensions research complementing existing oil spill research and technology development programs. This report provides the Coastal Response Research Center and oil spill community with guidance in identifying and implementing critical human dimensions research needed to support NOAA and its partners protecting the nation's coastal and ocean communities.

Human dimensions research is increasingly recognized and implemented to inform coastal resource management and disaster reduction. For example, the National Science and Technology Council report *Grand Challenges for Disaster Reduction* (National Science and Technology Council, 2005) recognizes the need for social science research to enhance communications of hazard information to affected communities so that they understand and trust the message, and respond in ways that facilitate response, restoration, and community development. The United Nations Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection recognizes that the social scientific field of institutional analysis provides a systematic way of obtaining an understanding of the nature, strengths, and weaknesses of institutions within the context in which they are operating or in which it is proposed they may operate in the future. It is, therefore, a key element in moving away from sectoral-based management of natural resources to a holistic approach indicative of that required for oil spill response and restoration.

NOAA has also formally recognized the mission-critical need for greater social science to understand the human dimensions of ecosystems. A review by an external social science review panel to NOAA's science advisory board in 2003 found that "the capacity of NOAA to meet its mandates and mission is diminished by the under-representation and under-utilization of social science." Among its recommendations to the SAB, the panel advised integration of social science goals, plans and outcomes into strategic plans; reprogramming and new initiatives in mission-critical social science; development of social science capacity, including senior-level social science representation; and development of specific strategies for increasing social science literacy throughout NOAA.

Broadly understood, human dimensions research aims to:

1. Understand human-environment interactions, including:
 - (a) the ecological role of humans as proximate *causes* of ecosystem stress, and underlying social drivers of those causes;
 - (b) *consequences* of ecosystem stress for the achievability, sustainability, and trade-offs among diverse societal objectives;
 - (c) human mitigation and adaptive *responses* to ecosystem stress.

2. Harness this understanding in policy, management, and other governance approaches to balance social and environmental goals in the context of natural resources management.

Multiple disciplines across the social and behavioral sciences, humanities, communication sciences, and related interdisciplinary studies are critical to achieve these aims (Figure 1).

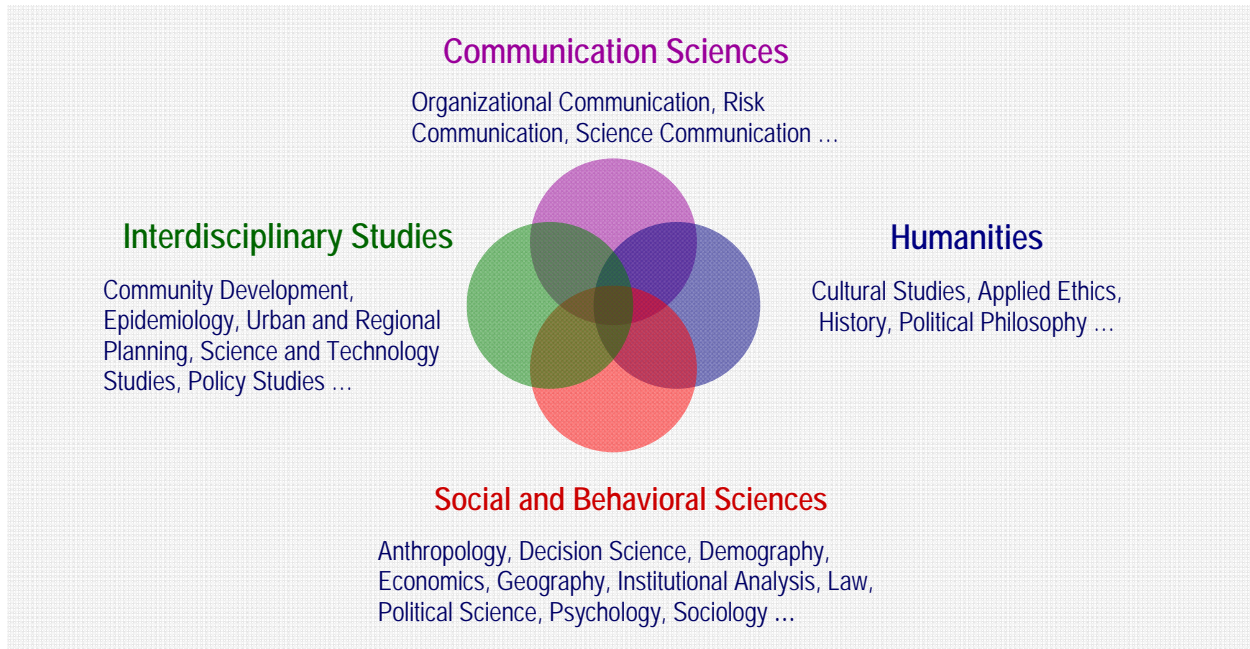


Figure 1: Interdisciplinary interactions needed to conduct meaningful human dimensions research.
Note: There must also be a connection to the natural sciences.

For example, in the context of oil spill response and restoration, human dimensions include:

- Issues associated with the human *cause* of oil spills:
 - Defining and designating legal and moral responsibility
 - Providing political, legal, economic, moral, or other incentives for responsible parties to engage trustee agencies and affected communities in response, restoration, and community re-development
 - Training to reduce spills and impacts of spills
 - Interacting in risky ways environment (e.g., oil exploration in harsh environments)
- Undesirable socio-cultural and economic *consequences* of oil spills and restoration/response efforts may include:
 - Loss of life
 - Disruption to subsistence traditions
 - Loss of recreational opportunities
 - Degradation to symbolic value, such as ancestral burial sites
 - Economic losses (e.g., oil, housing, fisheries, tourism, and non-market values)
 - Erosion of confidence in trustee agencies (e.g., NOAA, FWS)
 - Social corrosion
 - Psychological stress

- Aesthetic degradation
- Damage to critical infrastructure (e.g., private and/or public housing)
- Closure of cultural and historic places of importance
- Disruption of transportation, waste disposal, and other civic functions
- Port closures, laytime, and demurrage
- Community conflict
- Displacement of communities
- Decrease in quality and quantity of recreational experiences
- Aspects of response and restoration:
 - Environmental justice questions
 - Definition of the legal and moral endpoints of restoration
 - Stimulation of the virtues of civic and ecological engagement
 - Communication among trustee agencies, responsible parties, and communities

In November 2003, the Coastal Resource Response Center (CRRC), a partnership between the University of New Hampshire (UNH) and the National Oceanic and Atmospheric Administration (NOAA) hosted a diverse group of over 30 oil spill experts in the areas of oil spill processes, response techniques and habitat experts at the UNH Durham campus to identify and determine the best approaches for addressing research needs related to oil spills. One of the six general research topics generated from that initial workshop was on the *Social and Economic Concerns and Needs* associated with oil spills. A further refinement and prioritization of potential topics within that general area led to the identification of two distinct research themes related to the human dimensions of oil spills:

- Communication: Public and Stakeholder Participation in Response and Restoration
- Ecosystem Services: Identification and Valuation.

From 2004 through 2008, the Center funded, through its competitive grants program, five social and economic need based projects totaling over \$600,000, representing 20% its total research funding. In September 2005, the Center held a separate workshop entitled, “Research and Development Needs for Making Decisions Regarding Dispersing Oil,” which was originally intended to also include discussions on Human Dimension issues. It was readily apparent, however, that the topic of human dimensions of oil spills was both robust and too important and substantive to cover adequately as a section of the dispersed oil workshop. Hence, the Center decided to convene a separate research needs workshop on the Human Dimensions of Oil Spills, which would include dispersant use scenarios.

II. Workshop Organization and Structure

The Center’s Human Dimensions of Oil Spills Workshop was convened from June 13-15, 2006. The goal of the workshop was to bring together a broad spectrum of human dimensions researchers and oil spill practitioners, including industry representatives and regulators, to develop a list of research needs on human dimensions that could be used in the Center’s Request for Proposals (RFP) and announcements from other funding entities.

The workshop was specifically designed to gather holistic perspectives and feedback from all stakeholder groups involved in oil spill response and restoration including experts from the following:

- *Researchers* – Leaders in Economics, Applied Ethics, Institutional Studies, Risk Communication, Sociology and Anthropology
- *Responders* – Federal and state government agencies and private sector response contractors
- *Regulators* – Federal and state government agencies
- *Responsible Parties* – Oil companies and industry consultants
- *Impacted Parties* – Non-governmental organizations (NGOs) and communities

See Appendix A for a full list of workshop participants and their affiliations.

The Human Dimensions Workshop was organized around small group “breakout” discussions on six main topic areas – risk communication, valuing natural resources, social impacts, subsistence, coordination of response and restoration, and environmental ethics – which are further discussed in Section III of this report. Two of the six topics were discussed concurrently during each breakout session. See Appendix B for the complete workshop agenda. Each breakout group was further divided into two separate discussion groups, allowing for two independent subgroup discussions of each topic. Efforts were made to equally distribute participants by affiliation and expertise across concurrent topic discussions and topic subgroups to maximize exchange and reduce parochialism.

III. Scoping of Human Dimensions Issues into Suggested Research Topics

A diverse Organizing Committee (see Appendix C), led by Center Co-Directors Drs. Merten and Kinner, identified the following six major topic areas upon which to focus the scope of the human dimension research needs. The topic areas used to scope the dialogue and research outcomes at the workshop were:

Risk Communication

The “public perception” of any event, such as a marine oil spill, is shaped, created and recreated through many different processes and often hinges, at least in the social arena, on the effectiveness of communication. What is communicated (the metric used), how it is communicated (understanding the distinct values of all stakeholders involved) and the purpose of the communication (fostering cooperation, soliciting input, or information dissemination) are all critical in determining the adequacy and appropriateness of any oil spill risk communication. Study mechanisms for evaluating: (1) what the public values; (2) how different sectors of the public may value resources differently; (3) how individuals and/or groups gather and process information during times of stress or crisis; and (4) information delivery methods adequate to meet the needs and interests of each target audience.

Valuing Natural Resources

Estimating the value of natural resources before vs. after an oil spill is often an important and contentious step in the injury assessment and in establishing and evaluating the restoration process. The tension is rooted in the competing incentives of the responsible

parties and those who are charged with protecting the public interest as a whole. State-of-the-art techniques associated with natural resource valuation include: hedonic pricing, contingent valuation methodologies, and theories of public opinion. Hedonic pricing consists of the use of data from market transactions in which values for environmental amenities (or their losses) are econometrically-derived from prices. Contingent valuation consists of the creation of hypothetical choice scenarios in which the affected community's demand for environmental goods is estimated by aggregating individual preferences. Relevant theories of public opinion include cultural theory, environmental attitudes, and behavioral theories of environmentalism and market behavior. Emphasis must be placed on the application of these approaches to concrete problems, and the techniques must be made more accessible and useful to practitioners.

Social Impacts

Social impact assessment is an approach that can be used to examine social and cultural consequences of oil spills. These consequences can be found throughout the micro-macro continuum from individuals to communities to society. Micro-level impacts include: changes in social, cultural, and economic resources; increased levels of mental distress; family stress; alcohol and drug abuse; and out-migration decisions among individuals experiencing an oil spill. Community-level impacts include: changes in social capital and patterns of group interaction, as well as disruptions to the civic, occupational, and economic structures of a community. Macro-level impacts include: broader socio-cultural issues (e.g., trust in institutions); legislative and policy changes; legal rulings; and changes in cultural values and social norms. The significant body of social science research on the *Exxon Valdez* oil spill provides an example of a variety of approaches that can be used to assess social impacts of oil spills.

Subsistence

Subsistence use of natural resources can involve a variety of plant and animal species and continues to be a widespread nutritional, economic, social, and cultural phenomenon. When an oil spill occurs, subsistence users may lose valued resources either through real loss or perceived degradation of resource quality. The impact of this loss may resonate through affected communities and result in negative changes in community patterns of interaction and organizational structure. Strictly interpreted, OPA 90 does not allow trustees to consider restoration of lost subsistence use in Natural Resource Damage Assessments (NRDAs). The statute requires the affected subsistence users to bring their own cause of action against those responsible for the incident. Other NRDA restoration projects, however, may increase access to subsistence resources and create cumulative negative impacts on subsistence resources, as well as individuals and communities with strong social and cultural ties to subsistence.

Coordination in Response and Restoration

Oil spill prevention, preparedness, response and recovery rely on coordinated decision making and action among: federal, state, and local agencies integral to a legislatively-established National Response System; governmental and non-governmental scientific support; parties legally responsible for spills; and affected communities. Ineffective coordination can delay response and increase impacts to environmental, socio-economic and cultural resources of the affected communities. Institutional analysis and related social science disciplines identify practices to assess and improve coordinated

decision making and action among parties integral to oil spill prevention, preparedness, response, and recovery under OPA 90.

Environmental Ethics

The “Coordination in Response and Restoration” theme examines how parties with varied interests, capacities, and responsibilities can work together to *achieve success*. “Environmental Ethics” examines *what we mean by success* in the context of restoration by: 1) defining the endpoint of restoration, and 2) evaluating individual and institutional responsibilities in oil spill recovery and restoration.

1. Defining the Endpoint of Restoration

This is a legal question. The NRDA regulations promulgated under OPA 90 establish “baseline conditions” as the legal standard of success. Baseline refers to the “condition of natural resources and services that would have existed had the incident not occurred” – encompassing land, fish, wildlife, biota, air, water, ground water, drinking water supplies, and other such resources, and functions performed by them. Yet this legal standard invokes ethical questions with serious practical import. Do spill responders, regulators, and other parties integral to restoration have a legal or moral responsibility to restore public health, socio-cultural, and economic conditions degraded by an incident, including natural resource services not traded in markets? Such a responsibility would necessitate broadening restoration practice to conduct injury assessment and restoration planning explicitly with respect to social values such as cultural identity (e.g., maintaining cultural subsistence practices), family relationships (e.g., care of children), and community well-being (e.g., cooperative relations among neighbors and co-workers).

However, even if the legal standard is understood to encompass these values, the acceptability of “baseline” as the legal endpoint for restoration is itself questionable. On what grounds should *historical* conditions (i.e., those characterizing a community and its natural environment at the time of an oil spill) receive favored status? Is there good reason to think that the standard for restoration ought to demand engagement, coordination, and enhancement of community capacities to *improve* sociocultural, public health, economic, and environmental conditions in so far as practicable? This would be a standard of community engagement and development rather than restoration of the status quo.

2. Individual and Institutional Responsibilities in Oil Spill Recovery and Restoration

The regulatory framework for oil spill response and recovery is rich. It has largely developed in a period of regulatory innovation and has benefited from an environment of diverse experiences. In contrast, the discussion of individual and institutional ethical responsibilities in response to such incidents is only just beginning. Many, if not most, NOAA responders (for reasons entirely understandable) do not have ethics training or guidance even though their scientific training is exemplary. On a daily basis, NOAA professionals are confronted with ethical dilemmas which they may not recognize as ethical dilemmas or which present situations where there are no resources available to help them in their decision making process other than casual conversations among colleagues. As a

result, many NOAA professionals make substantial ethical decisions without understanding the existing moral frameworks which could provide them with reasons for assessing better and worse decisions in these contexts. As with the issues raised about the legal limits of restoration end-points, when regulations end, individual moral decision making begins. NOAA professionals and other responders would benefit from a rigorous discussion of the ethical problems they face in the field and the best practices in responding to those problems.

IV. Workshop Results

Following each breakout session, participants were reconvened in plenary session discussions. Each subgroup reported on their discussion of the given topic. For each research need/idea presented, participants were asked to provide comments on the following:

- Research Need – Identification of a specific area of research within the topic
- Objectives – Identification of the research goals
- Guidelines – Refinement of the research area to insure that all essential parameters are included
- Potential Impediments or Enhancements to Research – Identification of the research areas which may potentially prove difficult or illuminating vis-à-vis the topic
- Application to the Decision Making Process – Identification of specific applications that may be used by policy/decision makers in oil spill response and restoration

The results of this workshop are organized below in tables by topic area and reflect this format.

A. Risk Communication Projects

Risk Communication #1

Research Need	Case Study Comparison of Risk Communications Strategies and Goals Used During Oil Spills
Objectives	<ul style="list-style-type: none"> • Assess what has been done (what was the message, strategies, media types, who delivered the message?) • Assess what worked and didn't work (relation with message and action) • What actions did people take based on the messages given? • Identify best practices and recommend tools for use by Unified Command to reach best practices • Organizational methods of information exchanges with and between stakeholders (i.e., JIC, MAC) • Consider the role of the media in framing messages
Guidelines	<ul style="list-style-type: none"> • Cases cover a variety of spill sizes, special scale & communication attributes (regional, tribal, oil type, urban/rural, oil industry influence) • Fisheries closures/opening • How clean is clean? • Over time (longitudinally) • Issues of credibility of the individual vs. credibility of agency and visa versa
Potential Impediments or Enhancements to Research	<ul style="list-style-type: none"> • Account for different media techniques • Lack of baseline data • Quality of historic data • Interviews may be necessary • Literature review of other hazards would be useful • How do you determine the definition of success? • Institutional Review Board (IRB) approval if questions are used
Application to the Decision Making Process	<ul style="list-style-type: none"> • Practice development for risk communication under different scenarios • Inform the development of the risk communication framework/plan

Risk Communication #2

Research Need	<p>Communicating the Risks of Alternative Response Technologies (ARTs)</p> <ul style="list-style-type: none"> • How can you accurately convey the risks associated with the trade-offs inherent in ARTs?
Objectives	<ul style="list-style-type: none"> • Open more tools in toolbox • Minimize backlash of decision making • Develop mechanisms for engaging affected public in decision making process • Assess public expectations of oil spill response and the use of ARTs • Who best to deliver the message? • Who does the public perceive as credible? May depend on technology
Guidelines	<ul style="list-style-type: none"> • Public perception and any prior knowledge/understanding of response technology important • Consider lessons learned from past experience • Consider various media outlets • Vary for different regions, cultures
Potential Impediments or Enhancements to Research	<ul style="list-style-type: none"> • Fold into other project findings
Application to the Decision Making Process	<ul style="list-style-type: none"> • Improve risk communication • Include as part of risk communication framework/plan • Inform decision makers

Risk Communication #3

Research Need	Assessment of Risk Communication Messages Associated with Oil Spills
Objectives	<ul style="list-style-type: none"> • What triggers are there in people that cause them to act on a RC message? • Evaluate the effective use of different communication styles and techniques taking into account cultural, social, regional, sub-population difference (e.g., who got what message, how was it used?)
Guidelines	<ul style="list-style-type: none"> • Work directly with research communicators • Message testing can include focus groups that can review the content and visuals of the message • Stated preference studies may be useful
Potential Impediments or Enhancements to Research	<ul style="list-style-type: none"> • Responses highly varied • Public perception and prior knowledge/understanding/experience of spills, spill response and restoration
Application to the Decision Making Process	<ul style="list-style-type: none"> • Aid decision makers and those working directly with media outlets

Risk Communication #4

Research Need	Assessment of Risk Perceptions Related to Oil Spills
Objectives	<ul style="list-style-type: none"> • Public perception of organizations involved in oil spills (federal, state, local, responsible party) • Public perceptions of risk associated with the spill (take into account multilingual, cross-cultural differences) • Who are the primary trusted information sources (e.g., How are they determined? Are they different regionally, demographically) • What information is needed to align public perception with risk-wise behaviors? • Preferred delivery methods
Guidelines	<ul style="list-style-type: none"> • Build on information from affected and non-affected communities • Retrospective study/follow-up on past spills for actions people took according to message delivered • Consider similar work for assessment in other areas (e.g., liquefied natural gas) • Consider variation based on nature of event
Potential Impediments or Enhancements to Research	<ul style="list-style-type: none"> • None
Application to the Decision Making Process	<ul style="list-style-type: none"> • Further development of RC framework (RC research need #5)

Risk Communication #5

Research Need	Development of Risk Communication Framework for Oil Spill Response and Restoration
Objectives	<ul style="list-style-type: none"> • Draw on information developed from case-study, risk perception and message testing • Develop rapid assessment guidelines • Organization of stakeholders in framework development • Time-phase planning – response to restoration • Be aware that players/agencies change through the course of spill response to restoration (over time)
Guidelines	<ul style="list-style-type: none"> • Identify risk communication – needs/types in oil spill contacts (e.g. fisheries, subsistence, waste) • Sustainability for response
Potential Impediments or Enhancements to Research	<ul style="list-style-type: none"> • National Incident Management System (NIMS) • Other areas of similar research and framework development (i.e., food safety, homeland security, other pollution events) will inform this research
Application to the Decision Making Process	<ul style="list-style-type: none"> • Framework to be used by Unified Command • Improve risk communication and credibility of response and verification of information

B. Valuing Natural Resources Projects

Valuing Natural Resources #1

Research Need	Determining Social and Cultural Values Associated with Natural Resource Injuries Due to Oil Spills
Objectives	<ul style="list-style-type: none"> • Draw on interdisciplinary perspectives to define the full range of social and cultural values, including but not limited, to economic concepts of value • Review literature on social and cultural values and how these values relate to oil spills, pollution events, and disasters • Adapt and develop methodologies and approaches for measuring social and cultural values for use in oil spill context. These methods include: rapid appraisals, expert assessments stated preference surveys, and ethnographic analyses of cultural, community, and other intangible effects. Research illustrating how to make use of existing measures (including scales, indexes, and questionnaire items) would be an example
Guidelines	<ul style="list-style-type: none"> • Research in this area should involve researchers from multiple disciplines to obtain a holistic review of the various definitions of “value” that are examined • Studies are encouraged to include research subjects and topics (e.g., resources, ecosystems, spills) that are heterogeneous in order to increase the applicability of findings • The research may focus on different scales from individual to community, region, or nation • Researchers must pay special attention to clarifying the concepts of “values” being used (e.g., definitions, applications), and the types of stakeholders (e.g., citizens, responders) that hold these values and any important characteristics (e.g., ethnic, socio-economic) • If the topics are sensitive or there is mistrust among groups, researchers should consider collaborating with community-based partners
Potential Impediments or Enhancements to Research	<ul style="list-style-type: none"> • The research should address the relationship between the social and cultural values being studied and the concepts of values that are recognized by NRDA statues and regulations • The research findings may be incompatible with the current legal use of the term “value” in NRDA • It is insufficient to simply review concepts that are not typically used in NRDA; the research must synthesize the literature and make any adaptations necessary to apply the concepts to NRDA applications • Proposals are encouraged to describe how concepts, models, and paradigms from different disciplines and other situations (e.g., disasters) will be integrated
Application to the Decision Making Process	<ul style="list-style-type: none"> • Assist in making more effective response decisions • Assist in identifying and characterizing losses

Valuing Natural Resources #2

Research Need	Resource Tradeoff Studies
Objectives	<ul style="list-style-type: none"> • Develop and/or test stated preference and other (e.g., ranking) methods to elicit tradeoffs between habitats and/or restoration projects • Test effects of alternative information and education treatments on study results
Guidelines	<ul style="list-style-type: none"> • The research should attempt to measure tradeoffs held by different types of stakeholders on various attributes of restoration. It should also measure tradeoffs for different types of restoration (e.g., restoration of natural conditions, construction of recreation infrastructures) and different types of losses (e.g., recreation, injuries to various species including charismatic and non-charismatic) • Regional differences may require different survey instruments and designs • Sampling plans should consider sampling various stakeholder groups as possible (e.g., lay and expert communities, urban and rural communities) • Address how techniques might vary across settings and populations—these methods would not be one-size-fits-all • Consider whether approach can be used to address net environmental benefit decisions in the response phase • Consider non-charismatic fauna and ecosystem services • Research may propose primary data collections or the use and re-analysis of secondary data
Potential Impediments or Enhancements to Research	<ul style="list-style-type: none"> • Respondents may be reluctant to consider tradeoffs, especially tradeoffs between resources and money • Regional differences in ecosystem types and social preferences may require different survey instruments and designs • Researchers are encouraged to use regional or other restoration plans as source of information for study scenarios
Application to the Decision Making Process	<ul style="list-style-type: none"> • Public involvement in restoration decisions • Assist with restoration planning by identifying acceptable tradeoffs among resources and services

Valuing Natural Resources #3

Research Need	Advances in Recreation Demand Modeling Applied to Oil Spills
Objectives	<ul style="list-style-type: none"> • This area seeks research that addresses the limitations in recreation demand modeling to more accurately measure the value of lost resources and services. Two areas are of particular interest: <ul style="list-style-type: none"> • Accounting for the implications of endogenous residential location in coastal areas on recreational demand and values. Decisions about residential location and marine recreation are made simultaneously, rather than independently. • Individuals' choice sets of recreation sites—and opportunity for substitution—are limited in the short term, while multi-site recreation demand models seldom account for substitution limitations in valuing injuries.
Guidelines	<ul style="list-style-type: none"> • Multi-site choice models preferred • Take advantage of existing data when possible—consider data collected by agencies, academics, and non-profit organizations (e.g., SurfRider) • Consider combining existing datasets and innovative data analysis in lieu of primary data collection, when possible
Potential Impediments or Enhancements to Research	<ul style="list-style-type: none"> • Enhancements: existing econometric approaches and studies of endogenous behaviors and recently collected beach use data can be leveraged to accomplish these objectives without substandard development of new methods or primary data collection
Application to the Decision Making Process	<ul style="list-style-type: none"> • Improve accuracy of the recreational component of environmental damage calculations in NRDA's • Inform restoration planning

C. Social Impacts Projects

Social Impacts #1

Research Need	Cumulative social impacts of chronic or long lasting oil spills
Objectives	<ul style="list-style-type: none"> • Compare the social impacts of chronic, long lasting, and acute spills using either primary research and/or literature review • Identify how/whether communities adapt to chronic, and long lasting, spills • Identify how/whether adaptations are dependent upon social class, ethnicity, community dependence on natural resources, duration of impact, or scale of spill • Construct local history of human-environmental interaction through case studies
Guidelines	<ul style="list-style-type: none"> • Examine spatial relationship between incident and social impacts. • Focus within one region or state.
Potential Impediments or Enhancements to Research	<ul style="list-style-type: none"> • The study would be enhanced by an assessment of the use of participatory action research (PAR) • A challenge will be to design a short-term study (two to three years) capable of measuring the long-term impacts and adaptations
Application to the Decision Making Process	<ul style="list-style-type: none"> • The results of the study will inform the allocation of response resources. They may indicate that chronic and long lasting spills require some specific responses • Increased response capacity may be needed if social impacts of chronic and long lasting spills are equivalent in magnitude or importance to those of large incidents

Social Impacts #2

Research Need	Social Impacts of Post-Spill Assistance
Objectives	<ul style="list-style-type: none"> • Evaluate social impacts (indicators may include socio-economic characteristics, resource uses, satisfaction, and social capital) of monetary and support services aid on the affected communities • Assess methods/processes for aid distribution • Evaluate the attention given to community input regarding aid and support services
Guidelines	<ul style="list-style-type: none"> • Consider the duration of aid vs. need for aid • Address community complexity (e.g., class, social status, gender, age) and avoid over-simplified characterization of communities (e.g. red states, blue states)
Potential Impediments or Enhancements To Research	<ul style="list-style-type: none"> • Informant reliability may be unreliable which will complicate data collection and/or call into question the validity of results
Application to the Decision Making Process	<ul style="list-style-type: none"> • Determine if aid/support provided is efficient and effective – potential for reallocation

Social Impacts #3

Research Need	Community Resilience and Vulnerability to Social Impacts of Oil Spills
Objectives	<ul style="list-style-type: none"> • Overlay community features with respect to risk of an oil spill • Produce social risk maps within one region/state (big case study)
Guidelines	<ul style="list-style-type: none"> • Rely heavily on prior social impact literature to generate maps • Assess community dependence on natural resources and connection to the environment (non-extractive associations)
Potential Impediments or Enhancements To Research	<ul style="list-style-type: none"> • Give careful consideration to site selection for the case study • The case study should be useful for: (1) developing the methodology and determining its transferability to other locations, and (2) evaluating the resilience and vulnerability of a specific location that is likely to experience future oil spill events
Application to the Decision Making Process	<ul style="list-style-type: none"> • Identify hot spots that will require social impact response (strategic allocation of limited resources) • Identify institutional vulnerabilities and strengths in assessing responsibility for social impacts

Social Impacts #4

Research Need	Analysis of Community Vulnerability and Resilience to Oil Spills
Objectives	<ul style="list-style-type: none"> • Develop metrics and models to measure vulnerability and resilience • Understand population displacement • Develop approaches to reduce vulnerability and improve resilience
Guidelines	<ul style="list-style-type: none"> • Use interdisciplinary and comparative studies – include ecological, economic, social capital and longitudinal studies • Use displacement and discrepancy theory
Potential Impediments or Enhancements to Research	<ul style="list-style-type: none"> • Lack of baseline information • Lack of foundational relationships between natural and social systems • Emerging literature on global warming /sea level rise is an enhancement
Application to the Decision Making Process	<ul style="list-style-type: none"> • Improve understanding of community responses to oil spills • Improve policy tools to help cushion community impacts

Social Impacts #5

Research Need	Examination of Regional Differences in Perceptions and Responses to Oil Spills
Objectives	<ul style="list-style-type: none">• Understand attitudes and perceptions of oil spills• Compare public perceptions with what responders think the public thinks to address if a gap exists
Guidelines	<ul style="list-style-type: none">• Go beyond community – include media, state and local responders• Incorporate effects of different sources of information (e.g., traditional info, media, internet, science)
Potential Impediments or Enhancements To Research	<ul style="list-style-type: none">• Stay focused on spills, not industry
Application to the Decision Making Process	<ul style="list-style-type: none">• Help responders understand likely social responses• Prepare responders for potential social impact

Social Impacts #6

Research Need	Develop Approaches to Incorporate Human Dimensions into Oil Spill Response
Objectives	<ul style="list-style-type: none">• Enlighten the natural scientists and Unified Command• Incorporation of social science approaches into organizational structure, conducted by social scientists
Guidelines	<ul style="list-style-type: none">• Procedural justice model is useful• Sensitize responders to social science/human dimensions
Potential Impediments or Enhancements To Research	<ul style="list-style-type: none">• Organizational resistance – goes against the culture• Trained incapacities• This is happening in other natural resource domains, so information may be transferred to spill response
Application to the Decision Making Process	<ul style="list-style-type: none">• Clean-up/response becomes more sensitive to social issues• Synergy with other types of emergency response

D. Subsistence Projects

Subsistence #1

Research Need	Subsistence definition and mapping
Objectives	<ul style="list-style-type: none"> • Define “subsistence” • Identify levels of dependency- historical and cultural dimensions • Identify governance structures • Specify differences between institutional and user group definitions of “subsistence” • Examine resource substitution possibilities for affected subsistence populations • Examine subsistence distribution/exchange and social capital networks • Mapping of resource subsistence use in a particular state/region (use as a pilot to show feasibility, attract more funding)
Guidelines	<ul style="list-style-type: none"> • Use participatory mapping process as local expertise can define locations and resources being used • Include new subsistence user groups • Subsistence is more than resource use-cultural identity • Subsistence is more than “food” resources; it has a cultural component. • Many sources of data/GIS layers likely already exist. Partnering with other groups will eliminate redundancy of effort. See NMFS profiles of “Fishery Dependent” communities and EPA data • Develop partnership with responders so that GIS output will be usable in response activities
Potential Impediments or Enhancements To Research	<ul style="list-style-type: none"> • Reluctance to divulge information (e.g., legal issues) • Distinguish subsistence from recreational or commercial use • Identify existing mapping projects and products • Examine AK Dept of Fish and Game work for examples/models
Application to the Decision Making Process	<ul style="list-style-type: none"> • Assist in more effective response decisions • Assist in identifying and characterizing losses • Assist in mitigation and restoration • Research output feeds into National Incident Management System (NIMS) process – a social science assessment team (SSAT) that includes subsistence considerations

Subsistence #2

Research Need	Research on the Restoration of Subsistence Resources and Services After an Oil Spill
Objectives	<ul style="list-style-type: none"> • Measure effects of resource loss on user groups • Identify restoration approaches/concepts that benefit subsistence users • Determine if restoration projects designed for recreational anglers are detrimental to subsistence users (i.e. increasing access to contaminated resources good for catch-and-release fishers, bad for those that consume catch)
Guidelines	<ul style="list-style-type: none"> • Recognize dependency levels relative to loss • Recognize regional variations • Consider chronic spills vs. less exposed area • Consider different types of spills (chronic vs. single large events), types of oil – impact on resources • Ensure that there are links to National Marine Fisheries Service regulatory/management efforts on fisheries management
Potential Impediments or Enhancements To Research	<ul style="list-style-type: none"> • Teasing out subsistence use from recreation • Depends on definitions of subsistence • Providing clean resources in contaminated area • Existing literature – forest dependent and other resource dependent communities (e.g., hunting, trapping, lobstering)
Application to the Decision Making Process	<ul style="list-style-type: none"> • Assist in more effective response decisions • Assist in identifying and characterizing losses • Assist in mitigation and restoration

Subsistence #3

Research Need	Meta Analysis of Subsistence Research Literature
Objectives	<ul style="list-style-type: none"> • Produce a handbook of information for responders • Synthesize issues associated with disruption of subsistence (e.g., cultural identity, spiritual, social, nutritional)
Guidelines	<ul style="list-style-type: none"> • Identify experts in the field that can be called upon in case of spills in sensitive areas- list of researchers able to provide information rapidly • Use existing literature from similar areas, (e.g., focus on subsistence impacts by technological developments or non-oil accidents) • Consider regional differences
Potential Impediments or Enhancements To Research	<ul style="list-style-type: none"> • Check with AK Dept of Fish and Game for example of similar work
Application to the Decision Making Process	<ul style="list-style-type: none"> • Include subsistence expertise in responder training so that subsistence issues are considered in response phase • Database of experts by region

Subsistence #4

Research Need	Fill Data Gap in Subsistence Fishing in Urban Areas
Objectives	<ul style="list-style-type: none">• Determine information on location, frequency, species, modes of transport (leading to limit substitute site/resources), feasibility, demographics (e.g., native or not, income, race/ethnicity)• Identify a willingness to pay measure for subsistence trips• Determine and evaluate risk perception/knowledge of fish consumption advisories
Guidelines	<ul style="list-style-type: none">• Do follow-up study to determine losses following spill (could be done in area that experiences chronic spills so that the data can be used in following future spills)• Look at work done for other water pollution warnings and urban areas• Houston, New Orleans, New York are hotspots for urban spills and subsistence fishing use
Potential Impediments or Enhancements To Research	<ul style="list-style-type: none">• Partner with Sea Grant fisheries agents (they can identify locations, have contact with fishers)• Pre-spill research may be paired with risk communication research
Application to the Decision Making Process	<ul style="list-style-type: none">• Information necessary for compensation of subsistence loss• Aid to subsistence users that may be bringing third party claims (validated baseline data/findings)

E. Coordination in Response and Restoration Projects

Coordination in Response and Restoration #1

<p>Research Need</p>	<p>More effective models for community/stakeholder involvement in oil spill planning, response and restoration, or more generally-- Systematic appraisal of ‘lessons learned’ from past oil spills (meta-analysis of oil spills) <u>Research Questions:</u></p> <ul style="list-style-type: none"> • Are there systematic errors in planning, response and restoration that could be avoided if understood beforehand? • Are there good practices that should be emulated? • How is decision maker, community, or responsible party satisfaction influenced by methods used to involve communities/stakeholders? • Is the overall effectiveness of response and restoration (independently measured) related to the methods used to involve communities/stakeholders or other factors?
<p>Objectives</p>	<ul style="list-style-type: none"> • Evaluate models for stakeholder/community involvement currently in use for effectiveness • Assess perceptions of stakeholders’ roles: own organization and other organizations’ roles in response and restoration • Develop best practice models • Identify constituents of community resilience affected by community involvement in oil spill response and restoration • Develop model approaches that are sensitive to key stakeholders not part of official response apparatus • Identify relevant stakeholders including user groups (e.g., fishers, industry) who should be heard and types of incentives that encourage participation
<p>Guidelines</p>	<ul style="list-style-type: none"> • Role of community in information flow <ul style="list-style-type: none"> ○ Consider study of discourse between technical experts and affected community for evidence of ‘framing and informing’ dialogue, per National Research Council <i>Understanding Risk</i> (1996) • Retrospective and prospective (i.e., predictive) studies <ul style="list-style-type: none"> ○ Select past cases and examine change over time in responses of long duration; use spills of opportunity ○ Supplement existing databases with interviews, other primary data collection • Look to other agencies’ models (e.g., NOAA Emergency Response Division, National Incident Management System) <ul style="list-style-type: none"> ○ RCACs and other emerging models useful • Compare to other areas (e.g., natural and environmental hazards, terrorism) • Role of cultural, social and institutional context • Influence of type of involvement on satisfaction, ways that Unified Command can be more inclusive • Use evaluation metrics • Different sizes/types of spills, affected communities, other organizational parameters

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<p>Potential Impediments or Enhancements To Research</p>	<ul style="list-style-type: none"> • Time and cost for longitudinal studies or meta-analysis • Lack of tested models • Defining stakeholders • Willingness of organizations/stakeholders to participate • Access to data held by organizations • Recall bias is possible • Existing “lessons learned” records are a benefit, but not compiled to address a common set of questions or developed via systematic approaches
<p>Application to the Decision Making Process</p>	<ul style="list-style-type: none"> • Improves organizational response to oil spills, specifically informing on how to craft decision making approaches <ul style="list-style-type: none"> ○ Relative reliance on technocratic vs. democratic processes ○ Roles for expertise and community deliberation in response and planning ○ More effective input from stakeholders, community ○ Decreased conflict between communities (e.g., government, responsible parties) ○ Support for existing/new community organizations that makes them more resilient ○ More resilience of social fabric • Makes “lessons learned” accounts from past spills more useful via embedding in systematically developed context

Coordination in Response and Restoration #2

<p>Research Need</p>	<p>Identification and incorporation of local knowledge in oil spill planning, response and restoration</p> <p><u>Research Questions:</u></p> <ul style="list-style-type: none"> • Are there systematic biases or other institutional or cultural impediments to use of local knowledge? • Are there useful prima facie categorizations of local knowledge which, if understood, would facilitate greater use of such knowledge in oil spill planning, response and restoration? • Are there methods which, if used, would greatly facilitate incorporation of local knowledge into oil spill planning, response and restoration?
<p>Objectives</p>	<ul style="list-style-type: none"> • Identify ways to incorporate local knowledge into the response and restoration process • Identify and categorize relevant stakeholder knowledge and fit to stage of planning, response, restoration cycle • Examine how institutional, community, cultural and other constraints shape use of scientific vs. local knowledge (e.g., how responders consider and value local knowledge)
<p>Guidelines</p>	<ul style="list-style-type: none"> • Focus on ways that local knowledge can be used in NIMS/ICS, which is a given for spill response • Consider different sizes/types of spills, affected communities, other organization/community parameters • Desirable that methodology have explicit metrics for outcomes (i.e., public satisfaction, percent of oil removed) • Compare other models of emergency response and evaluate how local knowledge is identified and incorporated • Select past cases and examine change over time in responses of long duration; use spills of opportunity
<p>Potential Impediments or Enhancements to Research</p>	<ul style="list-style-type: none"> • What constitutes success in use of local knowledge and how to quantify it? • Quality of data available upon which to build – bias in historic literature • Influence of political context on decision processes
<p>Application to the Decision Making Process</p>	<ul style="list-style-type: none"> • Opportunity for better informed decision making • Better use of existing knowledge base

Coordination in Response and Restoration #3

<p>Research Need</p>	<p>Studies of organizational culture and its influence on preparedness, response, and restoration</p> <p><u>Research Questions:</u></p> <ul style="list-style-type: none"> • Do aspects of organizational culture influence interagency collaboration or dealings with the community/stakeholders in oil spill planning, response and restoration? • What roles do different governmental jurisdictions (e.g., federal, state, local) and non-governmental organizations play in oil spill planning response and restoration, and do aspects of organizational culture influence the extent to which their collective action is integrated? • How does organizational culture influence the ability of oil spill planning, response and restoration organizations to learn and adapt?
<p>Objectives</p>	<ul style="list-style-type: none"> • Understand inter-organizational relations • Understand intra-organizational structures and organizational development • Understand perceptions of roles within and across organizations involved in oil spill planning response and restoration • Understand how availability of resources influences organizational development and participation • Understand how organizations use different types of knowledge (scientific/local/traditional/tribal) and how knowledge use influences organizational development • Understand influence of legal/institutional structures • Understand role of formal/informal institutional structures
<p>Guidelines</p>	<ul style="list-style-type: none"> • Relate research to real-world planning/management activities • Consider whose science it is when assessing use/influence of scientific information • Consider different sizes/types of spills as influences on inter-organizational relations • Conduct longitudinal studies that emphasize organizational change over time • Look at other fields (e.g., hazmat, natural hazards management)
<p>Potential Impediments or Enhancements to Research</p>	<ul style="list-style-type: none"> • Defining stakeholders • Willingness to participate • Access to data
<p>Application to the Decision Making Process</p>	<ul style="list-style-type: none"> • Support for improved long term planning and rapid response • Support for improvement of coordination and relations in oil spill community • Support for more resilient organizations and communities, and development of performance metrics for resilience • Support for better use of information

F. Environmental Ethics Projects

Environmental Ethics #1

<p>Research Need</p>	<p>Assess the extent to which, and mechanisms by which, restoration practice promotes community development and meets other ethical criteria.</p> <ul style="list-style-type: none"> • Other ethical criteria may include standards of environmental justice and democracy (e.g., stakeholder participation in decision making such as deliberations selecting restoration goals)
<p>Objectives</p>	<ul style="list-style-type: none"> • Develop a case study comparison of the extent to which, and mechanisms by which, restoration practice promotes community development and meets other ethical criteria based on perceptions of researchers, responders, regulators, responsible parties, and impacted parties • Community development refers to practices engaging, enhancing, and coordinating community capacities to define and promote good socio-cultural, economic, and environmental conditions • Other ethical criteria may include standards of environmental justice and democracy (e.g., stakeholder participation in decision making such as deliberations selecting restoration goals)
<p>Guidelines</p>	<ul style="list-style-type: none"> • Establish criteria for selecting restoration projects to be analyzed, for example: <ul style="list-style-type: none"> ○ Consider restorations at multiple spatial scales ○ Consider restorations engaging diverse demographic, cultural, infrastructural, and other community attributes ○ Consider restorations with a broad range of impacts ○ Consider recent projects with contemporary regulatory, political, and other features ○ Consider completed projects and restorations in progress • Consider restoration processes and outcomes • Consider intended and unintended features of restoration processes Identify, explain, and legitimize the philosophical, political, sociological, and other background theory justifying the criteria against which restoration efforts are to be evaluated • Identify and consider the concerns, perceptions, and priorities of a broad spectrum of stakeholder groups in establishing the criteria against which restoration efforts are to be evaluated • Include environmental, socio-cultural, health, and economic values in defining the ethical criteria • Consider the role of citizens' advisory groups in promoting community development integral to restoration processes and outcomes • Consider the role of trustee councils in promoting community development integral to restoration processes and outcomes • Consider the influence of regulatory and organizational changes in the extent to which restoration processes and outcomes promote community development • Consider the role of communication messages and strategies among researchers, responders, regulators, responsible communities, and impacted parties in promoting community development integral to restoration processes and outcomes. (Objectives and methods of this study could merge with risk communication research) • Use ethnographic methods to understand the perceptions of researchers, responders, regulators, responsible parties, and impacted parties with respect to the extent to which, and mechanisms by which, restoration processes and outcomes promote community development and other ethical criteria

<p>Potential Impediments or Enhancements To Research</p>	<ul style="list-style-type: none"> • There may be changes in regulations and practices • There are variations in federal and state agencies and regional trustee councils
<p>Application to the Decision Making Process</p>	<ul style="list-style-type: none"> • Develop a guidebook for trustee councils (specifically) and researchers, responders, regulators, responsible parties, and impacted parties (broadly) that describes best practices for promoting community development and other ethical criteria in restoration practice, and highlights points for improvement • As a second component or follow-on to this study, research is needed to <ol style="list-style-type: none"> a) identify and promote policy, organizational, communication and other strategies for implementing best practices identified and b) incentivize responsible parties to play an integral role in their implementation

Environmental Ethics #2

<p>Research Need</p>	<p>As a second component or follow-on to the previous study, research is needed to identify and promote policy, organizational, communication, community-based and other strategies for promoting community development and other ethical criteria in restoration practice; and incentivize responsible parties to play an integral role in their implementation</p> <ul style="list-style-type: none"> • Community development refers to practices engaging, enhancing, and coordinating community capacities to define and promote good socio-cultural, economic, and environmental conditions • Other ethical criteria may include standards of environmental justice and democracy (e.g., stakeholder participation in decision making)
<p>Objectives</p>	<ul style="list-style-type: none"> • Identify policy, organizational, communication, community-based and other strategies for implementing best practices for promoting community development and other ethical criteria in restoration practice • Identify economic, moral, legal, and other incentives inducing responsible parties to play an integral role in implementing best practices for promoting community development and other ethical criteria in restoration practice
<p>Guidelines</p>	<ul style="list-style-type: none"> • Analysis of best practices in ecological restoration beyond the oil spill arena may provide guidance (Society for Ecological Restoration (SER) provides useful resources and contacts) • Consider requirements or recommendations for applying penalty monies incurred by responsible parties to implement strategies for promoting community development and other ethical criteria in restoration practice • Consider the possibility of changes to OPA 90 that would require community development and meeting other ethical criteria as endpoints of restoration
<p>Potential Impediments or Enhancements To Research</p>	<ul style="list-style-type: none"> • Existing legal regimes and social structure are impediments to developing restoration policy and practice to restore and enhance sound values
<p>Application to the Decision Making Process</p>	<ul style="list-style-type: none"> • Develop a guidebook for transitioning best practices (as suggested above) into restoration practices that enhance affected communities while achieving environmental goals

Environmental Ethics #3

<p>Research Need</p>	<p>Establish guidelines for individual ethical responsibilities by oil spill professionals in oil spill response and recovery</p>
<p>Objectives</p>	<ul style="list-style-type: none"> • Develop case studies of individual decision criteria used in the past by oil spill professionals in controversial situations (e.g., where the legal guidance provided by statutes is limited, conflicting, or non-existent) to establish a database of best practices • Determine if development of a “code of ethics” is appropriate for NOAA in general or oil spill professionals in particular • Promote work on how to best balance personal and professional moral obligations in spill response • Promote work on how to best confront anticipated ethical dilemmas in the field, especially involving situations complicated by uncertainty, lack of statutory guidance, and multi-jurisdictional conflicts
<p>Guidelines</p>	<ul style="list-style-type: none"> • Work should focus not only on resolving conflicts among and between persons in oil spill response and recovery but also investigate possible moral obligations which may come into play between humans and animals and/or ecosystems • Deliverables should be aimed at the production of training curriculum for professionals as well as possible formal guidelines • All work should take into account different social and cultural contexts which will be encountered in the field
<p>Potential Impediments or Enhancements To Research</p>	<ul style="list-style-type: none"> • Institutional Review Board approval for some projects may be necessary. • Other models of ethics training should be consulted for other relevant professional groups (e.g., Society for Wetland Scientists, Society for Ecological Restoration) • Interdisciplinary collaboration will be required to ensure adequate consultation between the humanities, social sciences, and natural sciences
<p>Application to the Decision Making Process</p>	<ul style="list-style-type: none"> • A chief aim of this research will be to “day light” common decisions by professionals in the field that have ethical components but which may suffer from a lack of rigorous discussion or training. Successful research in this area should enhance the comfort of environmental professionals with making these decisions as well as increase their sense of professional responsibility • This work will highlight questionable ethical practices and provide reason-based guidance for resolving ethical dilemmas • By providing a thorough and professional process for investigating and understanding ethical dilemmas in oil spill response and recovery this work will promote greater public accountability for NOAA as well as provide a stronger basis for civic trust for NOAA professionals

Environmental Ethics #4

<p>Research Need</p>	<p>Establish guidelines for institutional ethical responsibilities for oil spill response and recovery</p>
<p>Objectives</p>	<ul style="list-style-type: none"> • Examination of the current institutional framework in NOAA for the ethical dimensions of oil spill response and recovery. Identification of gaps in this framework and production of recommendations for providing a more complete institutional stance on the ethical dimensions of oil spill response and recovery • Assess the differences between individual and institutional responsibilities in oil spill response and recovery. Create guidelines for establishing the point at which institutional responsibilities end and individual responsibilities begin • Examination of the moral dimensions of the DOC trustee in oil spill response and recovery • Examination of institutional differences involving moral obligations to the public between NOAA and other Department of Commerce agencies • Examination of possible institutional responsibilities for promotion of environmental justice in oil spill response and recovery, or mitigation of conflicts of environmental justice arising from spill incidents • Examination of the potential and propriety of NOAA increasing the amount of public participation in oil spill response and recovery
<p>Guidelines</p>	<ul style="list-style-type: none"> • Work should involve comparative analysis of companion guidelines in other federal agencies (such as the National Park Service and the US Forest Service) where appropriate • Deliverables should be aimed at production of training curriculum for NOAA managers as well as possible formal guidelines • All work should take into account different social and cultural contexts which will be encountered in the field • Work relevant to environmental justice should examine EPA regulations on environmental justice criteria where appropriate
<p>Potential Impediments or Enhancements To Research</p>	<ul style="list-style-type: none"> • Institutional Review Board (IRB) approval for some projects may be necessary • Regional differences in institutional response to oil spill recovery and response may currently exist. Deliverables may seek to create a unified procedure for all NOAA offices or justify toleration of these differences • Examination of current ethics literature on the practice of restoration beyond oil spills should provide a good set of examples to work from • Interdisciplinary collaboration will be required to ensure adequate consultation between the humanities, social sciences, and natural sciences
<p>Application to the Decision Making Process</p>	<ul style="list-style-type: none"> • Assist in clarifying the benchmark for best practices by NOAA • This work will highlight questionable ethical practices and provide reason-based guidance for resolving ethical dilemmas • By providing a thorough and professional process for investigating and understanding ethical dilemmas in oil spill response and recovery this work will promote greater public accountability for NOAA • Assist in improving interagency cooperation within the Department of Commerce and between NOAA and other relevant federal agencies working in oil spill response and recovery

V. Workshop Summary

This workshop report is the collective output of the 2006 CRRC-hosted Human Dimensions Oil Spill Workshop. The research needs identified were proposed, debated and refined by the workshop participants as the critical issues needing further investigation within each of the six major topic areas. The workshop was intended to serve as a neutral arena in which the many oil spill responders and various stakeholders could come together to discuss human dimensions of spills to enhance research and development in the spill community.

This report provides the Center, NGOs, and federal and state agencies tasked with funding research in the area of oil spill response and restoration with a template of potential research topics to more effectively distribute the limited funds available. It also provides an integrated research planning tool to improve understanding of human dimensions and facilitate future decision making. This report provides the spill response community with an abbreviated work plan to inform the development of RFPs and other funding mechanisms. It also provides the research community with information to facilitate proposal writing, develop experimental designs, and improve the efficacy and relevance of future research on the human dimensions of oil spills.

Key Workshop Findings and Recommendations:

1. Risk Communication

Effective risk communications during and after an oil spill event are critical to the overall success of spill response and restoration efforts. Consideration should be given to those selected to deliver information to the public, which media outlets are used, and how messages are delivered (e.g., styles, techniques). Because the “public” varies greatly from one spill to the next, public perceptions and expectations should be considered during each response and factored into communication strategies. Assessment of public sentiment should be sensitive to factors such as cross-cultural, language, and regional differences.

Specific research needs identified in the workshop include: assessment of risk communication strategies, messages, successes and failures from a broad range of spills; evaluation of communication styles and message testing; assessment of risk perceptions; and the development of a risk communication framework. Critical to this work will be the assessment of risk communication information from prior spills and spill response and restoration efforts.

2. Valuing Natural Resources

The valuation of natural resources and resource services is conducted after a spill or other injury to resources in comparison with baseline data and involves a determination of the monetary and/or nonmonetary value of those lost resources/services. The perceived “value” of injured resources and resource services, as well as the possible restoration tradeoffs, will differ between individuals, populations, and settings. Interdisciplinary perspectives should be considered when determining the social and cultural values associated with injured resources and available restoration alternatives. Multiple stakeholder groups and community members should be involved in both the resource valuation and restoration decision making processes.

Research needs identified in the workshop were: studies on the social and cultural values associated with injured natural resources, including improved methods for measuring “value”; resource tradeoff studies considering various stakeholders, losses, and restoration options; and advancements in methods to accurately measuring lost recreation value.

3. Social Impacts

The social impacts resulting from an oil spill event are felt throughout the affected communities – from the fisherman who is unable to work, to the community suffering from the loss of recreational resources, to the general public left wondering when their lives will ever return to “normal.” The demographics of the impacted community (e.g., social class, ethnicity, age) should be considered as part of the social impact assessment and when monetary assistance and/or support services are being determined. A greater understanding of a community’s vulnerability or resilience to potential spills will help anticipate the possible social impacts and overall community response, better prepare responders, and improve response planning.

Research needs identified in the workshop were: comparative analyses of the social impacts of chronic or long-lasting spills (vs. acute spills) and assessment of community adaptations to such impacts; evaluation of the social impacts of post-spill assistance (e.g., monetary aid, support services, distribution vs. need); community resilience and vulnerability studies, including the development of social risk maps, and metrics and models for measuring vulnerability and resilience; assessment of regional differences in public perceptions and responses to oil spills, geared toward educating responders; and the development of means to incorporate social science perspectives into oil spill response efforts.

4. Subsistence

Our ability to thoughtfully evaluate and mitigate the impacts of oil spills on subsistence use resources and services can be limited by our understanding of the oftentimes numerous subsistence traditions in a given region. Spill response and restoration practices would benefit from the development of comprehensive maps and regional assessment and monitoring of subsistence communities and traditions. Subsistence users could be defined regionally and noted on maps and/or in guidance documents which indicate characteristics (e.g., fishery dependent) to note sensitive communities that may rely on these resources for more than just food or income, but also culturally, socially, and nutritionally. Efforts should be made to pre-identify possible resource substitutions for subsistence users in regions at higher risk for spills or other resource disturbances. In the aftermath of a spill, restoration project monitoring should be conducted to document how restoration efforts impact subsistence users. Baseline and post-spill studies in frequently affected areas could provide good reference data for effects of spills on subsistence users.

Research needs identified in the workshop were: include an inventory and mapping of regional subsistence use groups/cultures, to include resource use and cultural/historical dimensions; additional studies on subsistence fishing in urban areas, specifically geared toward filling existing data gaps; comprehensive assessment of subsistence use resources

and services restoration following spill events, to consider a variety of oils, spills, and impacts; and meta-analysis and synthesis of data/literature on subsistence use.

5. Coordination in Response and Restoration

A coordination of efforts is critical for successful pre-spill planning as well as post-spill decision making, response, and restoration. Participation from traditional stakeholders (e.g., responsible parties; federal, state and local responders; agencies providing scientific support) as well as affected community members (e.g., subsistence users, local industry, others not part of official response) should be sought before, during, and after a spill event. Such efforts will make better use of existing local knowledge and expertise and enhance community resilience by strengthening the existing social structure. Organizational culture and dynamics may also impact agency and stakeholder collaboration; the decision making process; and the evolution of spill planning, response and restoration.

Specific research needs related to the coordination of spill planning, response and restoration were: development of effective models for community and stakeholder involvement; improved integration of local knowledge and expertise; and the examination of inter- and intra-organizational cultures and their overall impact on spill planning, response and restoration. Critical to this work will be the assessment of information from prior spills and spill response and restoration efforts, as well as that from other arenas (e.g., natural hazards management, homeland security).

6. Environmental Ethics

Environmental response and restoration efforts are fraught with scientific and ethical challenges. Oil spill practitioners are often expected to make difficult decisions in situations where legal guidance is limited, conflicting or non-existent. Many spill responders and decision makers within the command post lack adequate background or training in ethical decision making, leaving them, at times, ill-equipped for situations complicated by uncertainty, lack of statutory guidance, or multi-jurisdictional conflicts. Greater weight should be placed on training practitioners on how best to contend with ethical dilemmas in the field and on the development of guidance on best practices for response and restoration. Standards for best practices could also be established on an agency or institutional basis.

Specific research is needed to: assess the degree to which, and means by which, restoration practices promote community development and meet other ethic criteria, such as standards of environmental justice and democratic decision making; identify and promote strategies (e.g., policy, organizational, communication, community-based) for implementing best practices to support community development in restoration practice; identify incentives (e.g., economic, moral, legal) for responsible parties to play an integral role in implementing best practices for promoting community development in restoration practice; and develop comprehensive guidelines for individual *and* institutional ethical responsibilities for spill response, recovery, and restoration.

VI. Conclusions

The human use dimensions, encompassing risk communication, valuing natural resources, social impacts, subsistence, coordination in response and restoration, and environmental ethics were noted as critical components to incorporate into NRDA and other NOAA and spill response processes.

Recurrent themes throughout discussions of the six research topics were: (1) increased education and training for responders on the human dimension issues; (2) educate responders on sensitive topics such as natural resource damage, and to those resources used for subsistence; and (3) increased pre-spill evaluation and mapping studies, indicating where affected communities will be, what resources are at stake, and how the user groups will be affected. These studies can be used to enhance spill response efforts. Follow-up studies using predetermined performance metrics are necessary to properly evaluate the effects on communities. Each region is unique and will require specific metrics.

VII. References

1. National Science and Technology Council. 2005. Grand Challenges for Disaster Reduction
<http://www.sdr.gov/SDRGrandChallengesforDisasterReduction.pdf>

Appendix A: List of Workshop Participants

Coastal Response Research Center
Human Dimensions Workshop
June 13-15, 2006

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Appendix B: Human Dimensions Workshop Agenda

Coastal Response Research Center Workshop “Research Needs Regarding the Human Dimensions of Oil Spills”

June 13 – 15, 2006
University of New Hampshire
320 Gregg Hall
Durham, NH

Monday, June 12, 2006

Arrival and Check In

New England Center
Hotel New Hampshire

Tuesday, June 13, 2006

Shuttle from Hotels to Gregg Hall (meet in hotel lobby at 7:45 am)

8:00 am	Continental Breakfast (Room 320)	
8:30 am	Welcome & Attendee Introductions	<i>Nancy Kinner, CRRC/UNH</i>
8:45 am	Background and Goals of Workshop	<i>Amy Merten, CRRC/NOAA</i>
9:00 am	Response to Oil Spills - Trustee Perspective	<i>Doug Helton, NOAA</i>
9:30 am	Response to Oil Spills - Responsible Party Perspective	<i>A. Michael Macrander, Shell Global Solutions</i>
10:15 am	The Exxon Valdez Disaster: A Case Study for Increasing Understanding of the Human Dimensions of Oil Spills	<i>Duane Gill, Mississippi State University</i>
11:00 am	Workshop Structure, Logistics & Outcomes Participant Operating Principles	<i>Eric Denny, Facilitator</i>
11:45 am 2:45 pm	Breakout Session I Discuss & Identify R&D Needs: Valuing Natural Resources Coordination in Response & Restoration	<i>Breakout Groups Facilitators Note Takers</i>
12:00-1:00 pm	Lunch (Buffet Lunch Available, Gregg Hall)	<i>Working lunch in groups</i>
2: 45 pm	Reconvene For Plenary Discussion, Clarification and Breakout Groups Reporting to Full Group on First Discussion Topics and Day’s Wrap-Up	<i>Eric Denny, Facilitator</i>
4:15 pm	Shuttle from Gregg Hall to Hotels	
6:00 pm	Shuttle from Hotels to Group Dinner	<i>(Seacoast Science Center)</i>

Coastal Response Research Center Workshop
“Research Needs Regarding the Human Dimensions of Oil Spills”

Wednesday, June 14, 2006

Shuttle from Hotels to Gregg (meet in hotel lobby at 7:45 am)

8:00 am	Continental Breakfast (Room 320)	
8:30 am	Overview & Review	<i>Eric Denny, Facilitator</i>
9:00 am	<i>Breakout Session II</i> Discuss & Identify R&D Needs: A) Social Impacts of Spills B) Risk Communication	<i>Breakout Groups Facilitators Note Takers</i>
11:30 am	Reconvene for Discussion, Clarification and Breakout Groups Reporting to Full Group on Second Discussion Topics	<i>Eric Denny, Facilitator</i>
12:15 – 1:15 pm	Lunch (Gregg Hall)	
1:15 pm	<i>Breakout Session III</i> Discuss & Identify R&D Needs: C) Subsistence Issues D) Environmental Ethics	<i>Breakout Groups Facilitators Note Takers</i>
3:45 pm	Reconvene For Discussion, Clarification and Breakout Groups Reporting to Full Group on Third Discussion Topics	<i>Eric Denny, Facilitator</i>
4:45 pm	General Discussion and Day’s Wrap-Up	<i>Eric Denny, Facilitator</i>
5:15 pm	Shuttle from Gregg Hall to Hotels Dinner (on your own); See map of area restaurants	

Thursday, June 15, 2006

Shuttle from Hotels to Gregg (See schedule)

8:00 am	Continental Breakfast (Room 320)	
8:30 am	Overview & Review	<i>Eric Denny, Facilitator</i>
9:00 am	General Discussion, Synopsis and Outcomes	
11:30 am	Shuttle from Gregg Hall to Hotels	

Appendix C: List of Organizing Committee Members

Coastal Response Research Center
Human Dimensions Workshop
June 13-15, 2006

Organizing Committee

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