

Oil spill response assessment: Objectives and metrics

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Purpose:

Oil spill response assessment

- Recognized as a critical and challenging need
 - Lindstedt-Siva 1999
 - Kuchin and Hereth 1999
 - Ott and colleagues (e.g., Haynes and Ott 2001, Ott et al. 1993)
 - Harrald and colleagues (e.g., Abordaif et al. 1995, Harrald and Mazzuchi 1993)



Purpose:

Oil spill response assessment

- Why assess after a spill response is completed)?
 - Facilitate organizational learning
 - Determine adequacy of area contingency plans
 - Provide information for legal disputes
- Why assess prior to a spill event?
 - Clarify and align objectives to inform contingency planning
 - Facilitate better communications with stakeholders
 - Establish expectations
 - Input into institutional planning (e.g., GPRA)
 - Justify procedures and resource needs
 - Establish procedures to gather relevant data



Project Goals

- Propose a framework for selecting metrics to assess oil spill response prior to a spill as part of preparedness planning.
- Assess level of agreement about spill response objectives.
- Develop criteria for assessing performance metrics.



Assessing Response:

Goals - Objectives - Metrics - Measures

- There is general agreement about goals
 - Oil Pollution Act 1990) Maintain safety of human life
 - Stabilize the situation to preclude it from worsening
 - Minimize adverse environmental and socioeconomic impacts by coordinating all containment and removal activities to carry out a timely, effective response.
- [case studies and literature review]



Assessing Response:

Goals - Objectives - Metrics - Measures

- General agreement about important objectives
 - Protect worker and public health and safety
 - Protect environment and mitigate environmental impacts
 - Protect cultural resources
 - Mitigate economic impacts
 - Mitigate social nuisance impacts
 - Address needs and concerns of the public
 - Gain public support for the response
 - Implement an effective and timely response
 - Meet legal and regulatory requirements
 - Establish a coordinated and effective response framework

- *But, priorities among objectives can be contested.*



What are people's objectives?

- Q Method
 - A type of discourse analysis
 - Provides holistic understanding of beliefs
 - Used to find perspectives within a group
 - People sort statements
 - Inverted factor analysis



Steps of Q method

- Select participant
- Sort 42 statements in 9 categories
- Interview about sort
- (Inverted) factor analysis of sorts
- Validate narrative descriptions with participants
- Q statements derived from:
 - Two case studies
 - Buzzards Bay, MA
 - Chalk Point, MD
 - Literature review



Buzzards Bay, MA

- 3 perspectives
- 16 participants
- 65% variance explained
- 2 people loaded on multiple factors



BB Perspective A

- 9 loaders (2 multiple loaders)
- A response should
 - establish clear roles and coordination among responders,
 - integrate local responders quickly,
 - be rapid *and* strategic,
 - focus on sensitive ecological resources and areas with multiple resource values,
 - not be driven by how the spill or response might affect local communities or on community involvement.



BB Perspective B

- 7 loaders (2 multiple loaders)
- A response should
 - be driven by the contingency plan,
 - have a well-organized unified command with a clear chain of command,
 - prevent damage as much as possible,
 - not be based on the belief that the spilled oil can be 'managed' by responders,
 - not get bogged down by community concerns or communication needs.
- There is ambivalence about the role of local responders and volunteers.



BB Perspective C

- 3 loaders (1 multiple loader)
- A response should
 - be integrated with a larger context of activities,
 - be driven by good information, not necessarily the contingency plan or public perceptions,
 - integrate local responders/leaders quickly,
 - protect species that are especially critical for the functioning of an impacted ecosystem,
 - protect those areas that have multiple resource values,
 - mitigate but not avoid harm to people,
 - provide consistent and accurate information to the public.



San Francisco Bay, CA

- 3 perspectives
- 13 participants
- 70% variance explained
- 1 person loaded positively on one factor and negatively on another factor



SF Perspective D

- 11 loaders (1 multiple loader)
- A response should
 - rapidly establish an effective organization to implement response actions,
 - be guided, initially, by the contingency plan,
 - in no way put people at risk,
 - protect critical ecological systems, especially those pre-identified as sensitive.
- Unlikely to emphasize objectives related to the concerns or needs of impacted human communities.



SF Perspective E

- 2 loaders (1 multiple loader with negative score)
- A response should:
 - mitigate long-term impacts to coupled human and environment systems, including
 - ‘foundational’ components of the ecosystem and
 - markets,
 - not be driven by public concerns or perceptions
 - not focus on on-water recovery and removal of oil.
- Unlikely to emphasize avoiding *all* situations that threaten human health whatsoever during the response.



SF Perspective F

- 1 loader
- A response should:
 - protect species that are especially critical for the functioning of an impacted ecosystem,
 - remove enough oil so that impacted species, habitats, and local communities can recover,
 - have a strategy for monitoring effectiveness,
 - be guided by, but not get locked into, contingency plans.
- Little credence given to the idea that oil can be *purposefully* directed to “sacrificial” areas.
- Mitigation of impacts to important regional economic activities is secondary.
- It is not possible to respond in a way that puts *no* responders at risk or avoids disrupting the integrity and culture of local communities.



Comparison of perspectives

- The importance of health and safety
 - Emphasized by one factor per case to a much greater extent.
 - One factor per case suggests that protection of health and safety must be balanced with other objectives.
- Mitigating ecological impacts is emphasized in each case, but not equally by all factors in each case.
- Mitigating impacts to cultural resources was not very salient in either case.
- Mitigating economic impacts was not a high priority to any factor - but it was especially de-emphasized in Buzzards Bay.
- In 5 factors the role of scientific analysis was emphasized when following the contingency plan was not - and vice versa.



Comparison of perspectives

- There was no support for minimizing costs to the responsible party; even though this was expressed as a concern because costs must be justified.
- Objectives related to addressing public concerns was almost universally ranked as unlikely to be emphasized, with two exceptions:
 - Buzzards Bay Factor C it was very important to ensure that consistent and accurate information be provided to the public.
 - San Francisco Bay Factor E it was important that Unified Command manage expectations about the clean-up so that they are reasonable.
 - The relative lack of emphasis on objectives related public opinion and public satisfaction stands in contrast to the emphasis that they were given in our case study interviews (Tuler et al. 2006a) and in the literature (e.g., Lindstedt-Siva 1999).
- As overall themes coordinated response and timely response were always emphasized to the same degree, but not equally in all factors.



Implications for spill response assessment

- **People that have experience with oil spills and responses in a particular region can agree about the relative importance of some objectives and disagree about the relative importance of others – even while they can all agree with higher order goals as expressed in policy and statute.**
 - **The problem isn't just about finding the 'right' metrics.**
 - **There is a need to clarify objectives on which assessments are to be based.**
 - **What to assess and how should emerge from a process that integrates analysis and deliberation.**



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