Using Consensus Ecological Risk Assessment (CERA) to Evaluate Oil Spill Response Options

Do More Skimmers Equal Better Response?

Mearns, A.J., and Evans, M.B., Emergency Response Division, Office of Response and Restoration, National Oceanic and Atmospheric Administration, Seattle, WA

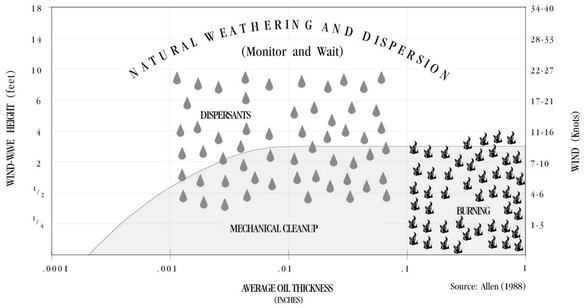
What is CERA?

- A simplified risk assessment method that people can apply without extensive training. A modification of the formal EPA protocol (EPA, 1998) by Aurand (1995).
- CERA workshop participants learn and practice assessing the relative benefits and impacts of alternative oil spill response actions.
- Participants include resource trustees and stakeholders from local, state, and federal agencies and from NGOs.

Why is CERA needed?

- Arguments about response strategies are common during oil spill responses, slowing decision-making. Chemical dispersants are especially contentious. Windows of opportunity can close for some response options (e.g., the oil emulsifies and can't be skimmed or burned, the sea state changes so that equipment can't be used).
- Discussion, intuition-building, and consensus-building before a spill happens could promote a response that best enhances recovery.

Spill response options under various wind/sea conditions and oil film thicknesses (modified from Allen, 1988).



How CERA works

1. Workshop designers define a realistic oil spill scenario in the area of concern.
2. NOAA uses a computer model to predict the fate of the spilled oil and to forecast potential concentrations of dispersed oil in the water column if dispersants are/are not applied.
3. Working in small groups, participants score the risk to each resource at risk from each response option. To score risk, they estimate the percentage of the population that could be injured, and the expected recovery time. Groups record their justifications for each risk score. Resource experts are available to each group.
4. When groups' risk scores differ, participants compare rationales for risk scores and discuss whether consensus is in order. Groups may agree to differ.
5. Participants develop recommendations for the Regional Response Team and compile lessons learned.

Response options typically considered:

- No response
- Open water mechanical cleanup (skimmers)
- In-situ burning
- Open-water dispersant application
- Mechanical shoreline cleanup

		Recovery time of injured resource			
		> 10 years	5 – 10 years	2 – 5 years	< 1 year
% of population or habitat injured	>50% (Large)(A)	1A	2A	3A	4A
	30-50% (B)	1B	2B	3B	4B
	10-30% (C)	1C	2C	3C	4C
	<10% (Small)(D)	1D	2D	3D	4D

A typical risk matrix used in a CERA workshop

high level of concern *moderate level of concern* *low level of concern.*

	Resource at risk			
Response option	Sea birds	Mangrove	Coral reef	Sea grass
No response	2A	3A	4C	4D
Mechanical 25% effective	2B	3A	4C*	4D*
Dispersion 50% effective	3B	4A	3B	4D
Burning 25% effective	3B	4A	4C	4D

Hypothetical, simplified outcome for one work group analyzing a single spill scenario

high level of concern *moderate level of concern* *low level of concern.*

Results to date

- 19 workshops (1996 – 2007); 15 sponsored by US Coast Guard; all co-facilitated by NOAA; 522 participants trained.
- CERA workshops have helped prompt new research to resolve uncertainties on the toxicity of dispersed oil to marine organisms and generated new questions about ecological recovery times.
- Anecdotal information indicates that CERA workshops have prompted some changes in local spill response planning: equipment stockpiles relocated; revisions to dispersant preapproval agreements.

Issues

- Hazard is from brief oil concentrations that decline over time. Effects of such exposures to marine life aren't well understood.
- Including all stakeholder groups has been challenging. NGOs have been least well represented.
- Consensus is not always achieved.

Why group scores differ:

- "We disagreed on the number of sea birds in the path of the spill…"
- "We need to know more about the recovery rate of coral exposed to dispersed oil …"
- "We thought the skimmers would rip up the sea grass beds…"

Next steps

- 1 - 2 workshops annually around U.S.
- Formal assessment project ("Do CERA workshops facilitate decision-making during spill response and planning?"), and peer review.

References

- Allen, A. 1988. Comparison of response options for offshore oil spills. *Proceedings, Arctic and Marine Oil Spill Pollution*, Vancouver, June 7-9, 1988, pp. 289-306.
- Aurand, D.V. 1995. The application of ecological risk principles to dispersant use planning. *Spill Science and Technology Bulletin* 2(4):241-247.
- EPA, 1998. Guidelines for Ecological Risk Assessment. *Federal Register* 63(93):26846-26924.

For more information

- NOAA Office of Response and Restoration: http://response.restoration.noaa.gov
- Ecosystem Management & Associates: http://www.ecosystem-management.net