In-situ Burning

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Charlie Henry
Director, NOAA's GOM Disaster Response Center

Five Emergency Response Questions?

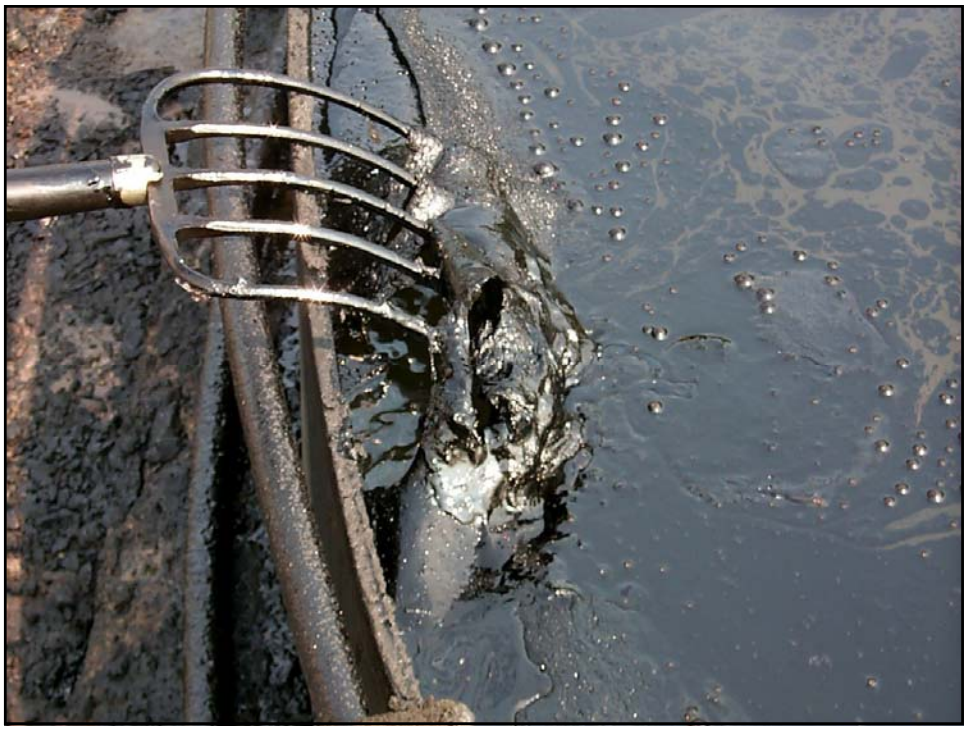
- What was spilled? (Oil Chemistry)
- Where is it going? (Oil Forecasts)
- What's at risk? (RAR/ESI)
- How will it hurt? (Potential Impacts)
- What can be done to mitigate the hurt?

(Alternative Response Technologies)

DO NO MORE HARM THAN GOOD

Was there any in-situ burns during the Exxon Valdez Response?

Burning Oil at Sea Research



Basics of Burning Oil at Sea

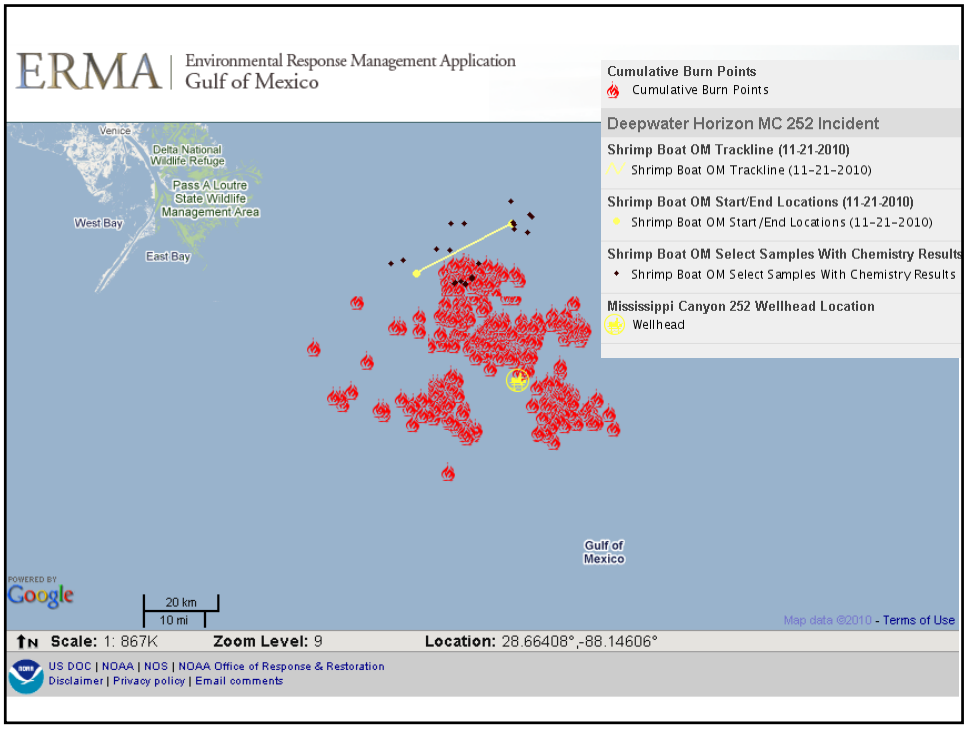
- **Oil must be several mm thick to support sustained combustion on water – thicker better.**
- **Requires mechanical recovery prior to burning.**
- **Oil must not be emulsified (water-in-oil) more than 50% (maybe a bit higher water content if you can get a hot enough fire initiated).**
- **Ignition systems maybe hand deployed or helio-torch (jellied gasoline).**
- **Not 100% Efficient (is anything 100% efficient?)**

12

Burn Effectiveness In General

- **90-98% Effective at removing surface oil.**
- **Primary products are CO2 and H2O.**
- **Some 5% of the oil removed from the surface are incomplete combustion by-products:**
  - **particulates such as smoke and soot**
  - **Polynuclear Aromatic Hydrocarbons (pyrogenic)**
- **Plume monitoring may be required (SMART).**
- **Surface residues are highly distilled oil residues and may sink especially after the begin to cool.**

13


ERMA
Environmental Response Management Application
Gulf of Mexico
Venice
Delta National Wildlife Refuge
Pass A Loutre State Wildlife Management Area
West Bay
East Bay
Gulf of Mexico
Cumulative Burn Points
Cumulative Burn Points
Deepwater Horizon MC 252 Incident
Shrimp Boat OM Trackline (11-21-2010)
Shrimp Boat OM Trackline (11-21-2010)
Shrimp Boat OM Start/End Locations (11-21-2010)
Shrimp Boat OM Start/End Locations (11-21-2010)
Shrimp Boat OM Select Samples With Chemistry Results
Shrimp Boat OM Select Samples With Chemistry Results
Mississippi Canyon 252 Wellhead Location
Wellhead
POWERED BY Google
20 km
10 mi
Map data ©2010 - Terms of Use
Scale: 1: 867K
Zoom Level: 9
Location: 28.66408°,-88.14606°
US DOC | NOAA | NOS | NOAA Office of Response & Restoration
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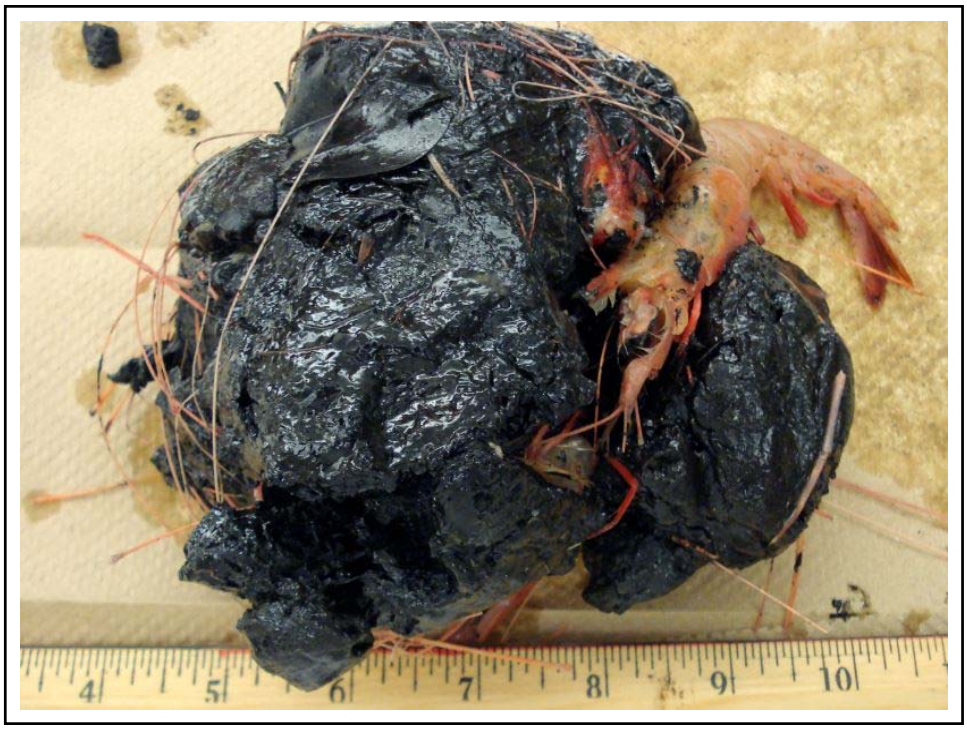

PROS:

- **Removes a large amounts of oil very fast (>2000 bbl/hr) – much faster than a skimming system.**
- **No storage capacity issues.**
- **Removes the bulk of the oil from the water surface with no significant increase in dissolved hydrocarbons into the water column.**
- **Often has a relatively broad window of opportunity (often days).**

17

CONS:

- **Limited to same mechanical encounter rate challenges as skimming operations.**
- **Moves pollution from water to air.**
- **Highly visible plume (public is often alarmed).**
- **Combustible liquids only (not emulsified oil).**
- **Requires specialized fire boom systems.**
- **May require air monitoring (SMART and maybe other requirements).**
- **Will likely require wildlife monitoring.**

18

CONS:

- **May require RRT approval (Preauthorization)**
- **Residues may sink (often sink) – exclusion zones pre-identified in RRT6 Authorization (maybe these should be revisited -expanded).**

19