

**Dispersants: What have we learned,
and opportunities for improvement to better
inform decision making relevant to dispersants
and their use?**

GOMRI Conference, Mobile, Alabama

SETTING THE STAGE

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Disclaimer:

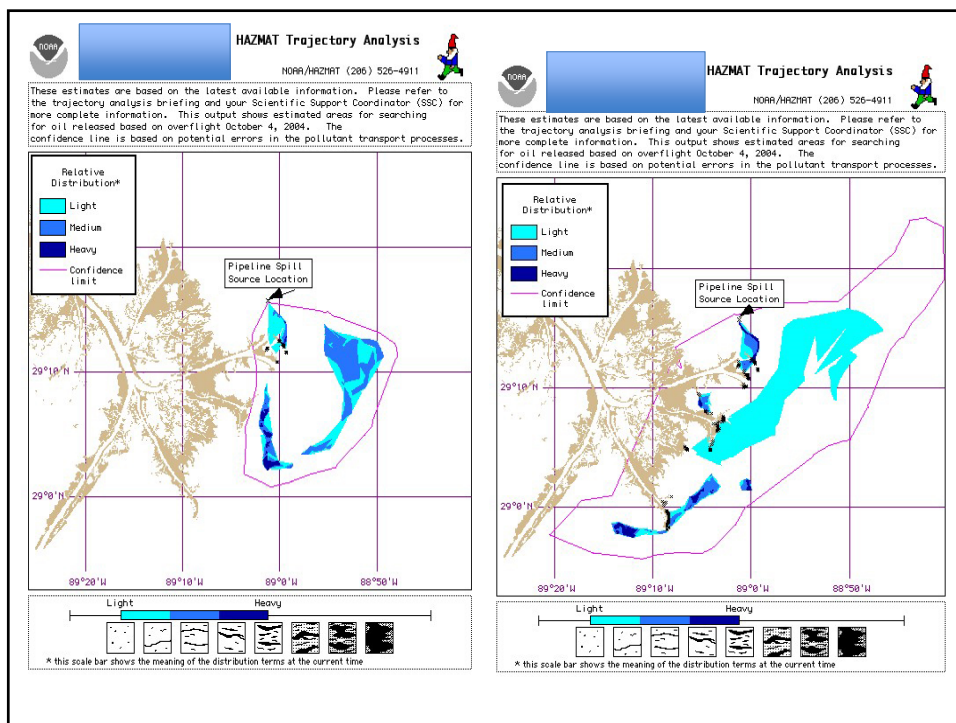
The information presented reflects only the views of the presenter,
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**THIS IS THE TIME TO DISCUSS
PROS AND CONS
POSITIVES AND NEGATIVES
ALTERNATIVES**

THERE IS LITTLE TIME DURING AN EVENT

**THIS IS JUST AN EXERCISE
THIS IS A DRILL
THIS IS A REAL POSSIBILITY**

- Last night - Pipeline Failure off the Mississippi River Delta
- Source control – Ends of Pipeline Shut – Pot. 40K BBL
- Equipment has be mobilized
- The GRP is being used to identify and protect sensitive coastal areas (takes time – cannot deploy at night)
- Before mid-morning today – overflights have mapped a large slick off the Louisiana Coast





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- Before mid-morning today – overflights have mapped a large slick off the Louisiana Coast
- **At 1:00 PM today – RP has requested the tactical use of aerial dispersants to FOSC. Sunset is 5:32 PM (before 3:30 PM a final decision is required)**

Setting a Foundation

- **Response Culture - Do No More Harm Than Good**
- **Response Strategy and Deepwater Horizon Challenges**
- **What are Dispersants? Why are dispersants considered in strategic and tactical response planning?**

Fundamental Oil Spill Response Strategy

- **Prevention**
- **Protection of Life**
- **Source control**
- **Contain the oil at or near the source**
- **Protect sensitive habitats/environments**
- **Recover spilled oil**
- **Mitigation - Minimize environmental impact from the spill and enhance natural recovery**

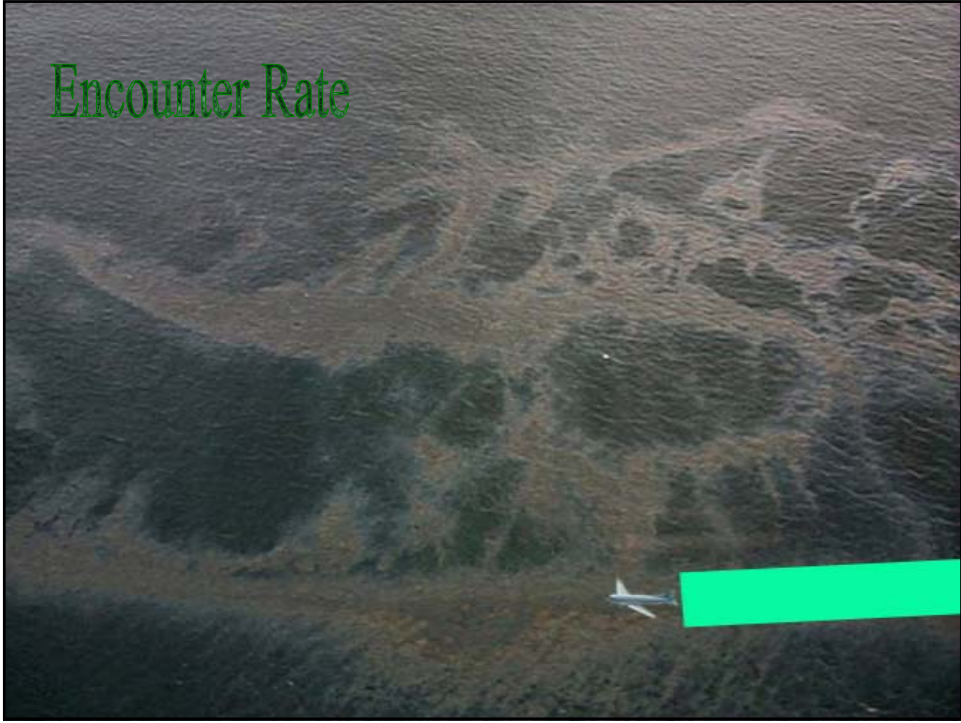


Deepwater Horizon Incident - Challenges

- **Prevention**
- **Protection of Life (11 fatalities)**
- **Source control**
- **Contain the oil at or near the source**

- **Protect sensitive habitats/environments**
- **Recover spilled oil**

- **Mitigation - Minimize environmental impact from the spill and enhance natural recovery**



What are Dispersants?

What do they do?

(Surface Application)

G “Mixtures of solvents and surfactants”

LIPOPHOBIC
HYDROPHILIC
(WATER LOVING)



HYDROPHOBIC
LIPOPHILIC
(OIL LOVING)

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“...just Like Dawn™ Detergent (?)”

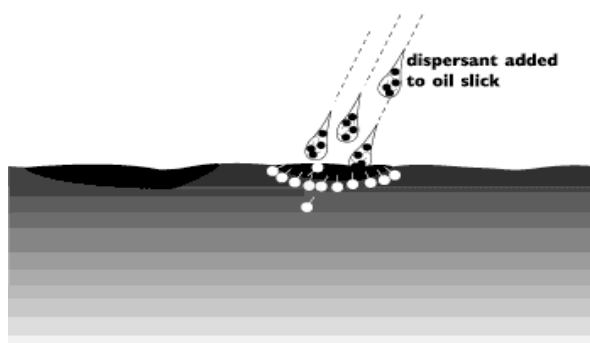
- u Dispersants, like detergents, reduce the interfacial tension between water and oil, permitting the oil to break into tiny droplets. The function of the solvent is to reduce the viscosity of the surfactants. The solvent may also aid in surfactant-oil interaction.
- u “For good or bad” - Dispersants enhance a natural process.”

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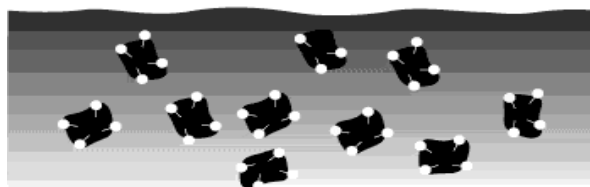
- Dispersed oil is not “gone” from the environment.
- The ultimate fate of oil spilled in the marine environment is biodegradation.
- Dispersion enhances the rate of natural biodegradation by increasing the surface area of the spilled oil – it also changes where oil is in the environment (trade-offs).

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How Do Dispersants Work?



One end of each dispersant molecule 'chain' attaches to water molecules while the other end of the 'chain' attaches to the oil droplets.

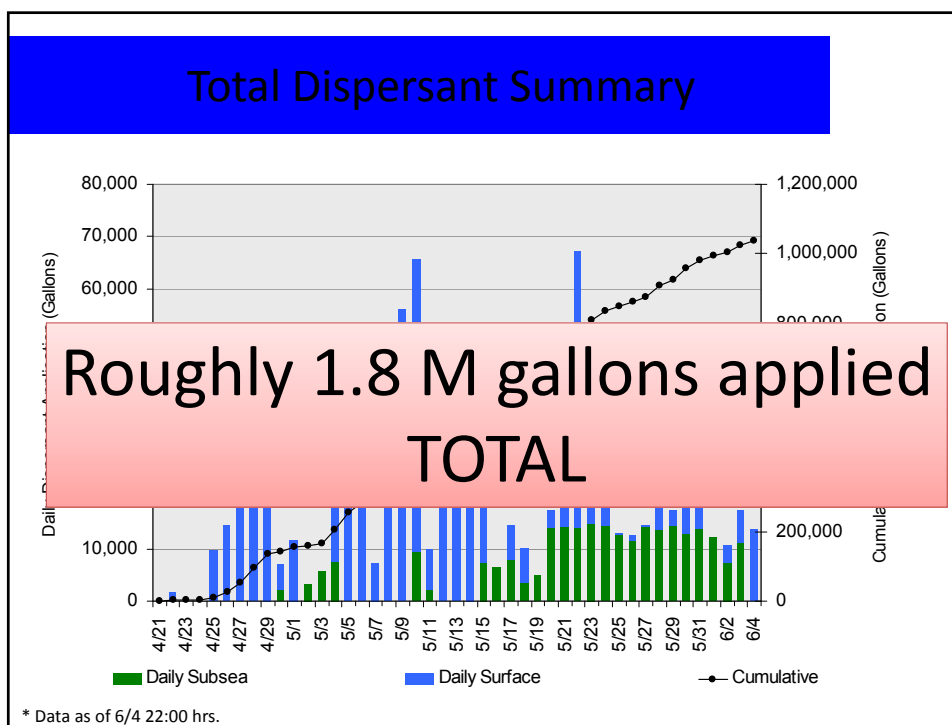


A little energy from wind and waves breaks the oil slick into smaller oil droplets surrounded by dispersant molecules as shown.

Again, why consider using dispersants?

- ✓ Aerial application of dispersants can mitigate large amounts of oil if treated promptly.
- ✓ Mitigate -- reduce the overall impact of an oil spill to the environment as a whole.
- ✓ Clearly, dispersant use is a **trade-off**: increased risk to the water column to reduce injury to surface water and shoreline resources.

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Sub-Surface Application

- Operational Issues and Authorization
- Would it even work? (mixing and resonance times)
- Dispersed Plume Transport (Where would it go?)
- Receptors or Natural Resources at Risk (Who would get hit?)
- Overall Spill Trade-offs
- Monitoring for Effectiveness (Efficacy) and Effects
- Adaptive Management Strategy



Setting a Foundation

- Response Culture - Do No More Harm Than Good
- Response Strategy – Deepwater Horizon Challenges
- What are Dispersants?
- Response Culture – “Nothing to be gained by a second kick of a mule.” Learn from Past...
- Spills are unplanned and uncontrolled events.
- “Spills are not true scientific experiments – but there is only so much that can be done in a laboratory.”