Special Monitoring of Applied Response Technologies

SMART background

- November 1997, a workgroup consisting of Federal oil spoil scientists and responders from the USCG, NOAA, US EPA, and US CDC to draft guidelines generating the SMART Protocols.
- SMART establishes a monitoring system for rapid collection and reporting of real-time, scientifically based information, in order to assist the UC with decision-making during in situ burning or dispersion operations.

Monitoring Dispersant Operations

Tier I	Visual monitoring; Trained aerial observer, flying over the oil slick and using photographic job aids or advanced remote sensing instruments, assessing dispersant efficacy and reporting back to the UC
Tier II	Combination of visual monitoring with on-water teams conducting real time water column monitoring at a single depth, with water-sample collection for later analysis.
Tier III	Expands on-water monitoring to meet the information needs of the UC: 1. Two instruments are used on the same VSL to monitor at two water depths 2. Monitoring is conducted in the center of the treated slick at several depths from 01 to 10 meters. 3. A portable water laboratory provides: water temp, pH, conductivity, dissolved oxygen, and turbidity

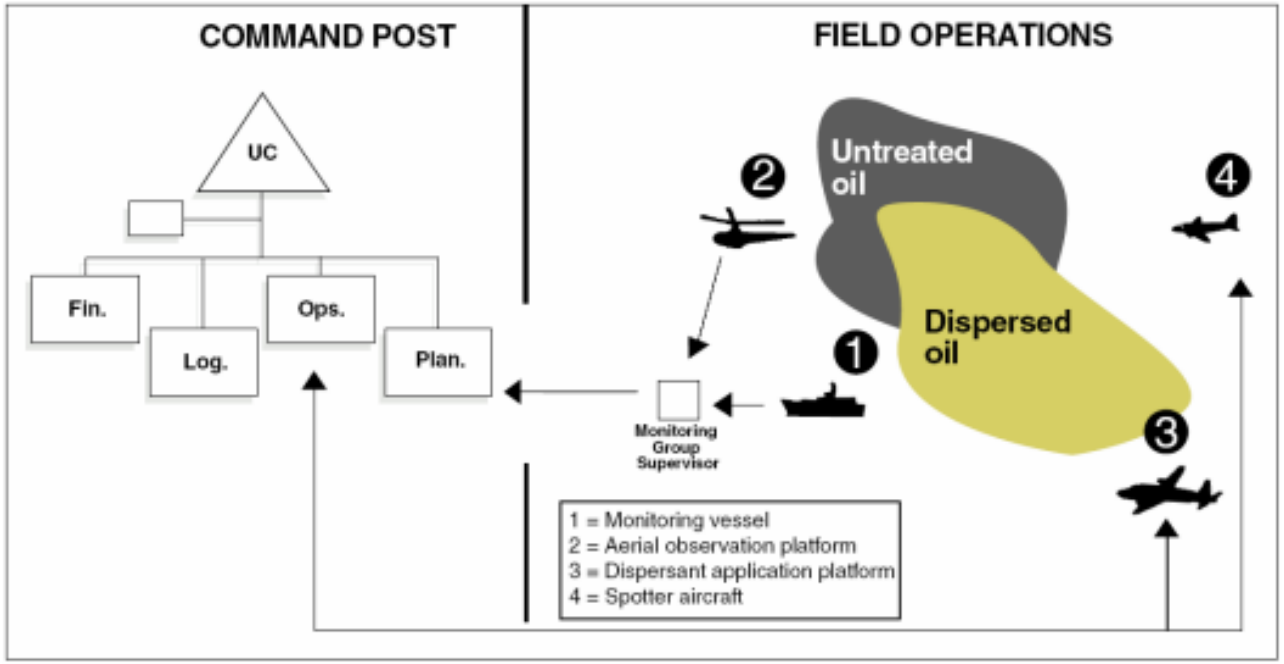


Figure 1. Command, control, and data flow during dispersant monitoring operations.

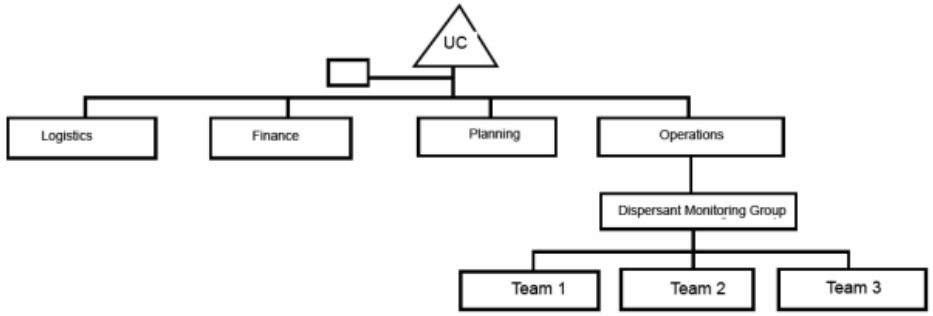


Figure 2. The Dispersant Monitoring Group in the ICS structure.

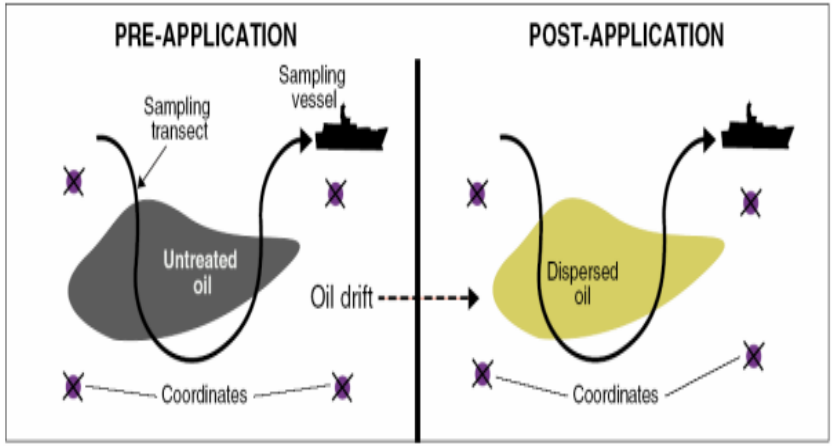


Figure 2. The box coordinates Method.

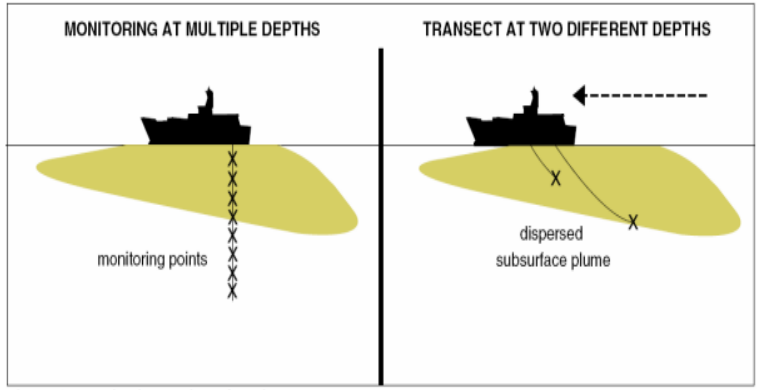


Figure 3: Monitoring options for Tier III.

Why Sample?

Number of Samples?

- Collection of water samples during Tier II and III monitoring should assist in correlating instrument readings in the field to actual dispersed oil concentrations in the water column.

- Collect one water sample per monitoring depth during the background (no oil) transect. The fluorometer readings prior to collection should be relatively constant.
- Collect two samples per monitoring depth during the pre-dispersant monitoring (under untreated oil slick). Try to collect water samples correlating with representative fluorometer values obtained.
- Collect approximately three samples per monitoring depth during the post-dispersant transects.

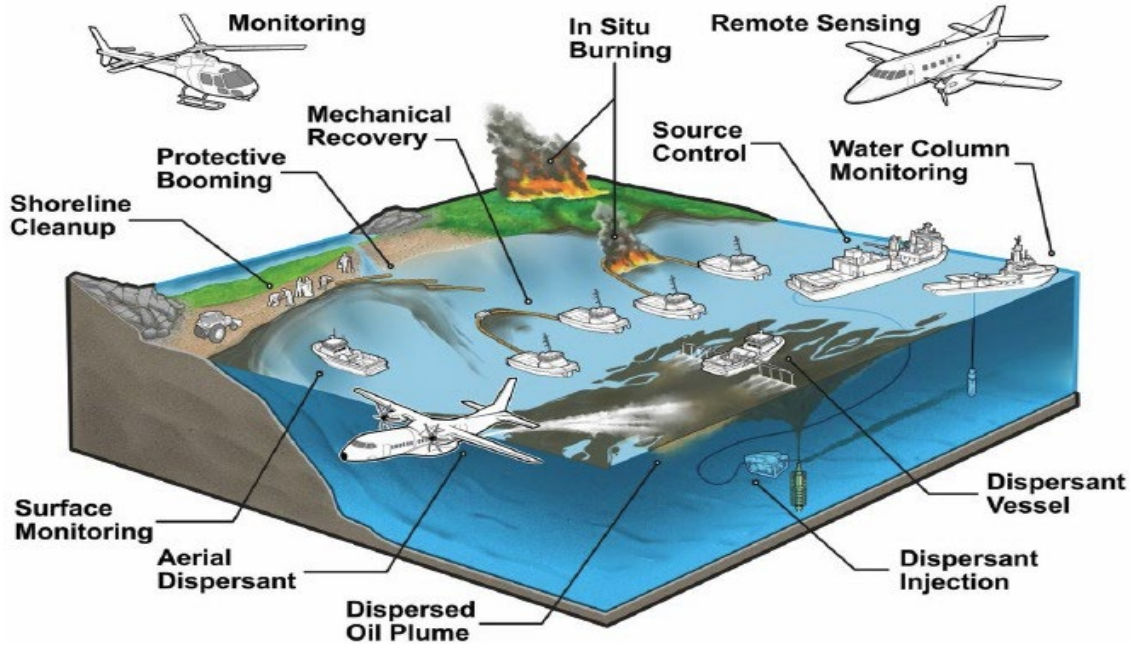
Authorization of Dispersants?

Where is the list of Authorized dispersants?

How can the use of dispersants be approved?

In Situ Burning Operations

- This operation may offer a logistically simple, rapid, and relatively safe means for reducing the net environmental impact of an oil spill.
- Burning can quickly eliminate large quantities of spill oil. ISB removes oil from a surface by combustion of hydrocarbon vapors and their conversion into predominantly CO2 and water which are released to the atmosphere.



Command, Control, and Data Flow

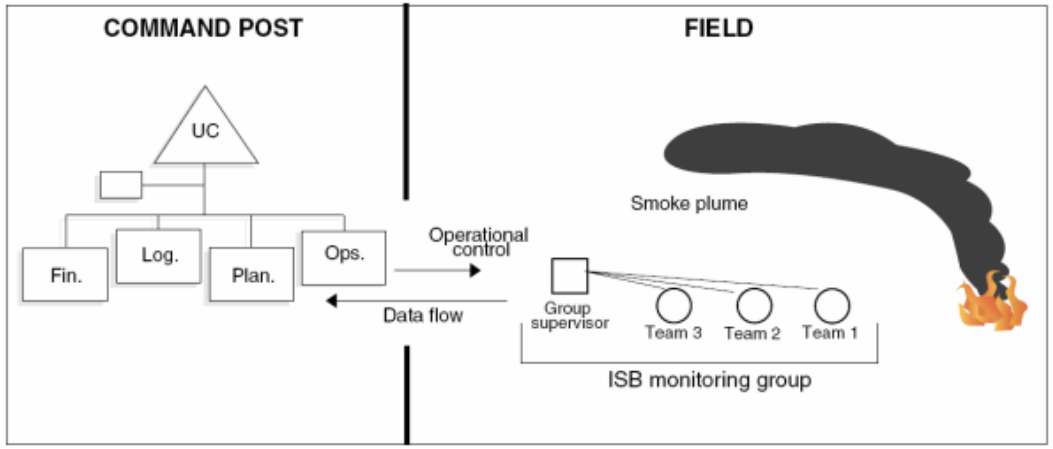


Figure 1. Command, control, and data flow during in-situ burning monitoring operations.

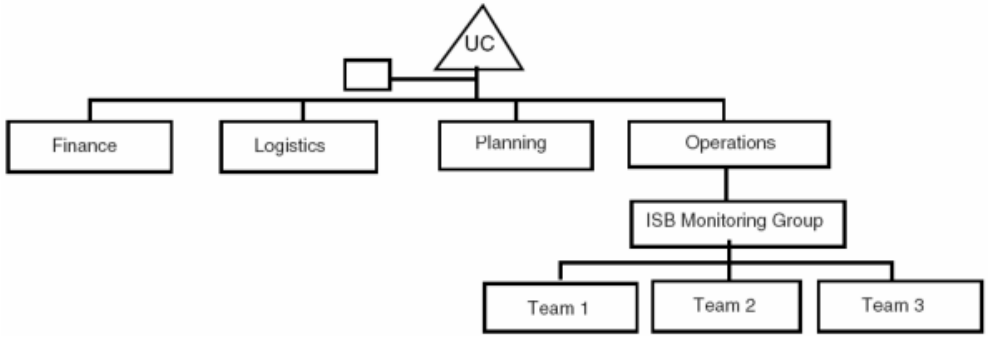


Figure 2. ISB Monitoring Group in the ICS organization.

In Situ Burning Considerations/Requirements Q&A

- Oil thickness, how thick does the oil need to be to generate burnable concentrations of hydrocarbon vapors to sustain combustion?
- What are the minimum ignitable thicknesses for the following: fresh oil, Aged un-emulsified crude/diesel, and IFO 380/Resid/Bunker C?
- What type of boom is used during ISB operations?
- What color plume will be generated during burning operations? What is it generally comprised of?

Sampling/Air Monitoring (DustTrak)

SMART RECOMMENDS AT LEAST THREE MONITORING TEAMS FOR LARGE-SCALE BURNING OPERATIONS.

EACH TEAM USES A REAL-TIME PARTICULATE MONITOR (DUSTTRAK) CAPABLE OF DETECTING SMALL PARTICULATES EMITTED BY THE BURN. 150 MG/M3 OF PM-10 AVERAGED OVER 24 HOURS (EPA AIR QUALITY STANDARD)

What are some logistical concerns regarding monitoring?

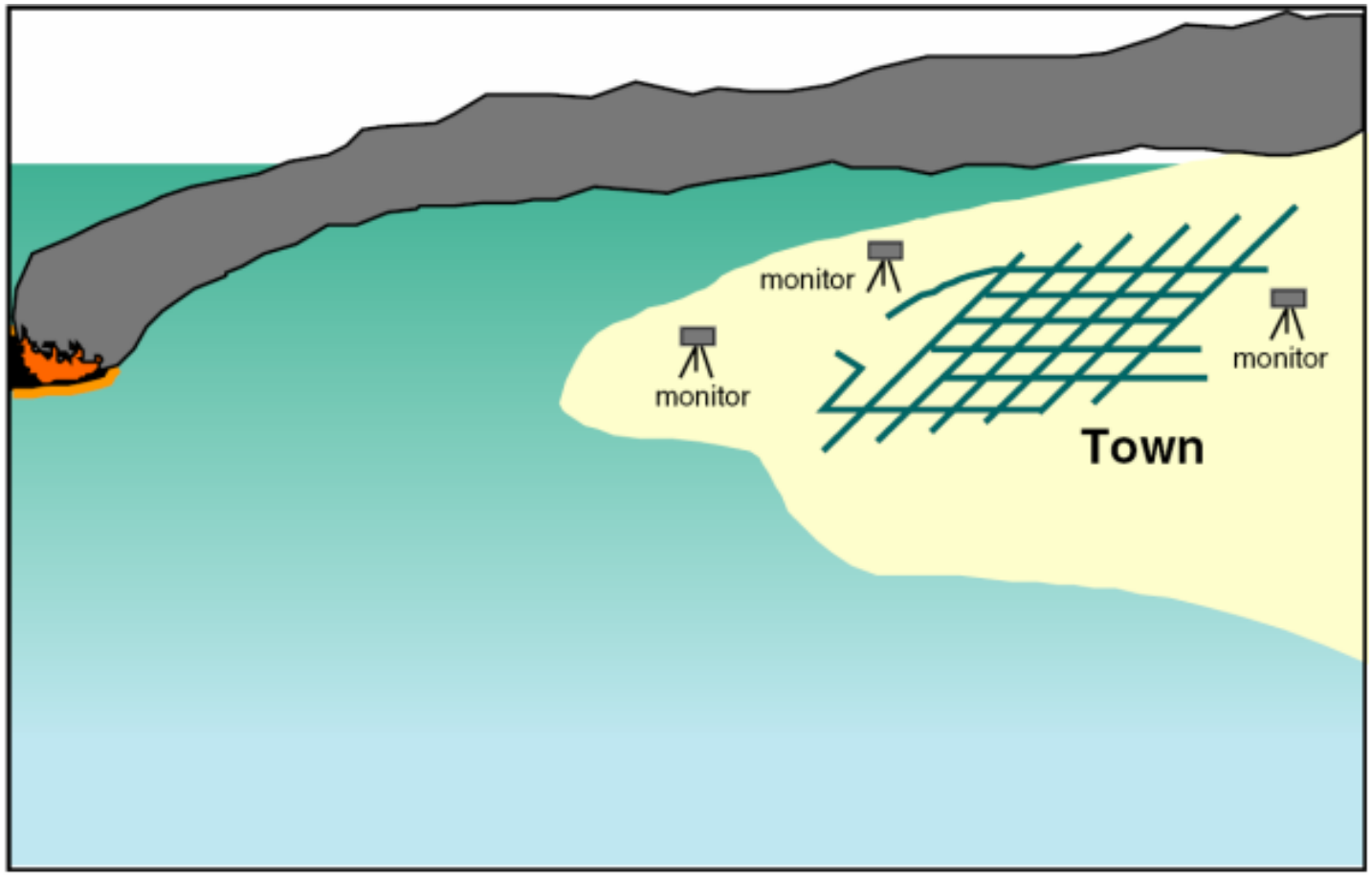


Figure 1. Possible locations of monitors (not to scale).

In Situ Burning Expirement (Video)

References:

- Special Monitoring of Applied Response Technologies (SMART)
- Home – NRT
- Resources | response.restoration.noaa.gov
- NSF – SMART
- SMART – TTP
- ExxonMobil Oil Spill Response Field Manual