

## NATURAL DISPERSION

- Some oil will disperse naturally into the water column, depending on:
  - Oil type
  - Mixing energy (wind and wave action)
- Where oils are amenable to dispersion and the energy is sufficient, dispersed oil will be present in the water column before any chemical dispersants are applied.



## ROLE OF CHEMICAL DISPERSION

- Enhancement of natural dispersion, therefore:
  - diluting and reducing oil on the sea surface; and
  - increasing availability of oil for biodegradation
- Can also delay the formation of persistent water-in-oil emulsions
- Can reduce non-stable emulsions to oil and water

## DISPERSANT COMPONENTS

- Dispersants comprise of a blend of:
  - Surfactants to reduce the surface tension at the oil/water interface, allowing the formation of small oil droplets
  - Solvent to increase solubility in oil and deliver the surfactant to the oil/water boundary

## EFFECTIVE APPLICATION ON A SMALL SCALE

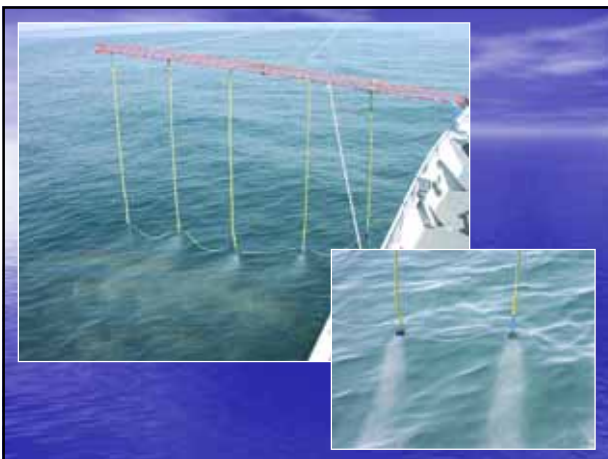


### LIMITATIONS OF DISPERSANTS

- Sea state:
  - Wave energy
  - Optimum wind speed (4 -12m/s)
- Oil properties
  - Viscosity
  - Pour point
  - Wax and asphaltene content
- Timing of application



### APPLICATION METHODS



### VESSEL SPRAYING

- + Readily available
- + Easy to load and deploy
- + Relatively inexpensive
- + Fairly accurate application
- Low treatment rate
- Difficult to locate heaviest concentrations of oil from the bridge

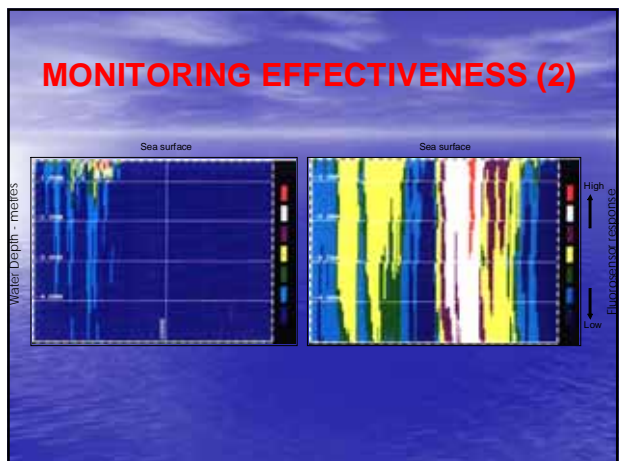


### AERIAL SPRAYING

- + Rapid response
- + High treatment rates
- + Optimum dispersant use
- + Good for off-shore response
- Can be costly

### MONITORING EFFECTIVENESS

- Essential to continuously monitor:
  - Sea and weather conditions
  - Weathering and condition of oil
  - Dispersant targeting
  - Dispersant effectiveness
- Visual monitoring
  - Reduction of oil coverage
  - Change of oil appearance
  - Coffee vs milky plume
- UVF



## ENVIRONMENTAL CONSIDERATIONS

Successful dispersion =  
Increased concentration of oil in the water column =  
Increased toxic effects of the dispersed oil

No dispersion =  
More oil remains on the sea surface  
More oil is washed up on the shoreline



## SUMMARY

- Dispersants can rapidly and effectively treat large volumes of oil, and can be cost effective
- Can minimise pollution damage to sensitive coastal resources
- However, limitations must be understood
- Sensitive resources should be considered and prioritised
- Small window of opportunity, therefore need quick decision-making and fast response
- CONTINGENCY PLANNING!

## Further information:

- ITOPF Technical Information Paper: The Use of Chemical Dispersants to Treat Oil Spills (updated 2005)
- ITOPF Handbook 2006/2007
- [www.itopf.com](http://www.itopf.com)

