



The Global Initiative for West, Central and Southern Africa

Webinar #3: the use of dispersants in case of an oil spill

Example of the good use of dispersants as part of oil spill response

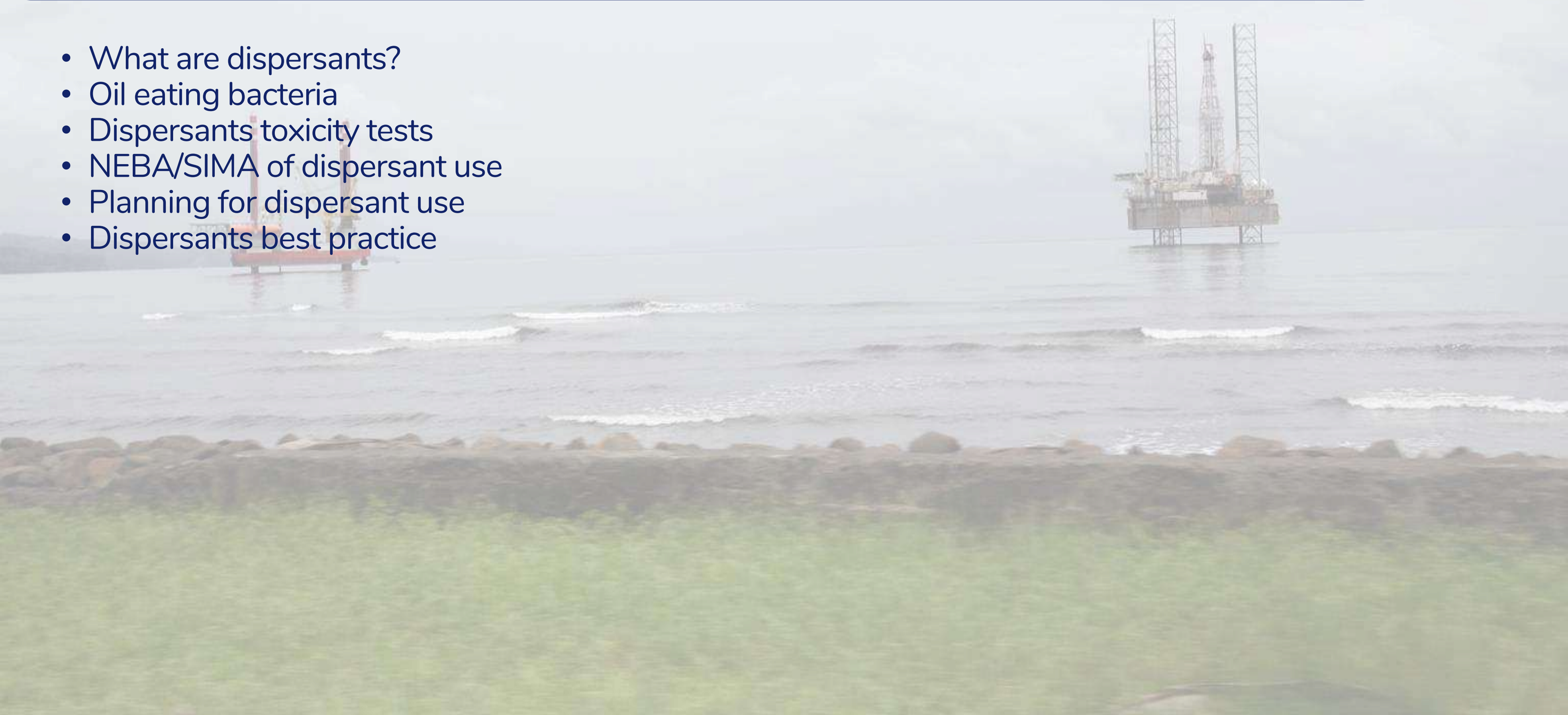
Justina Lee
OSEC, Shell

21 June 2021

Agenda



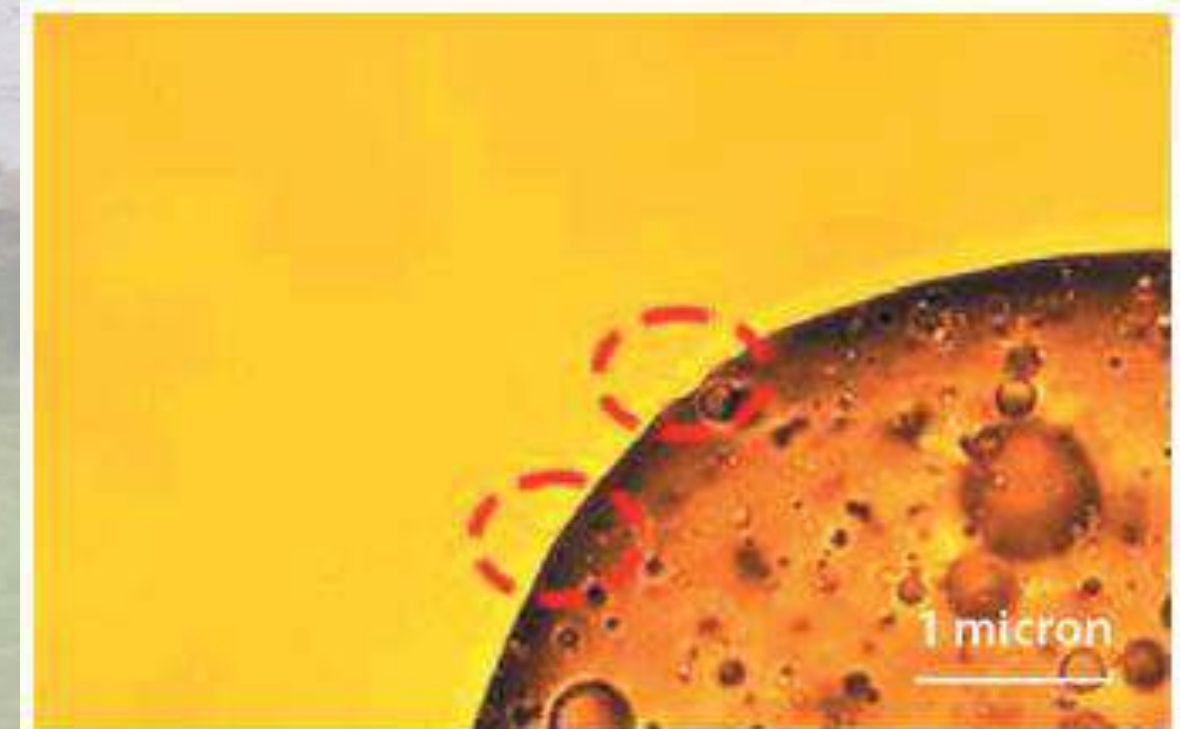
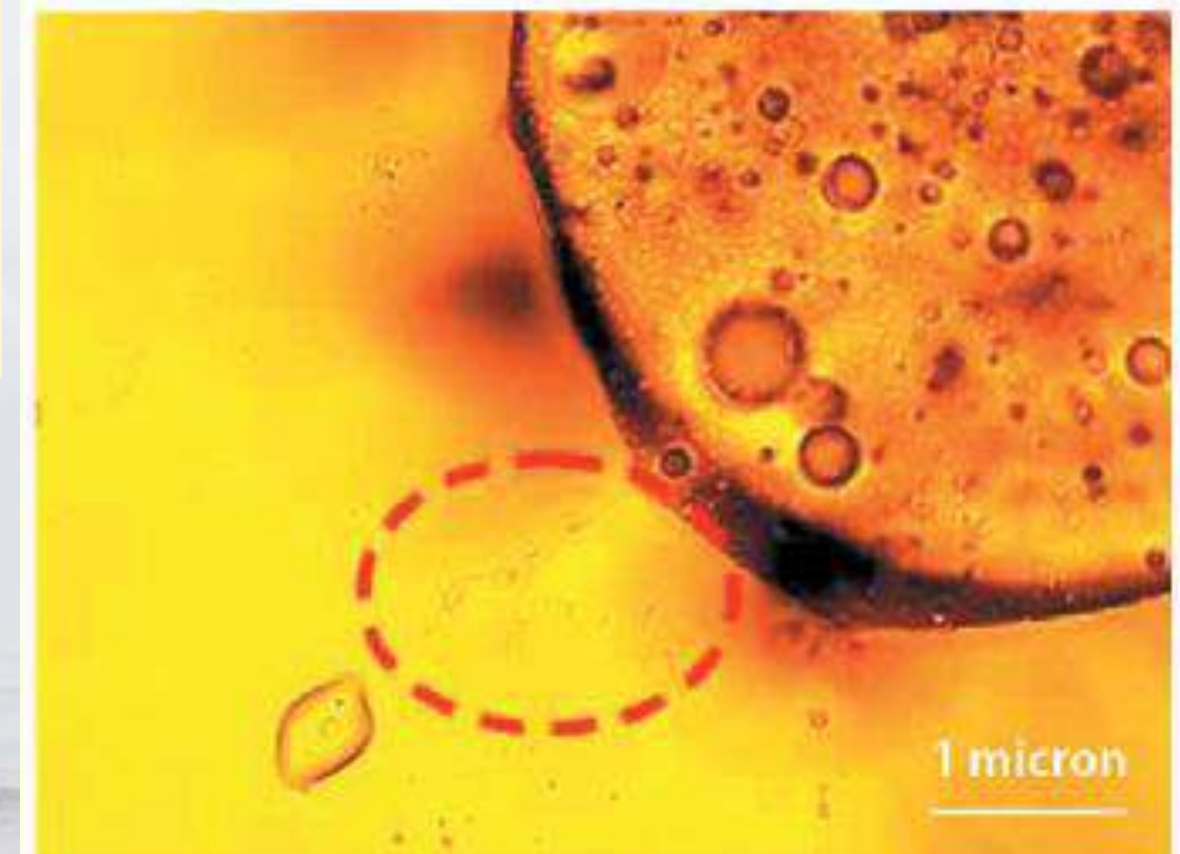
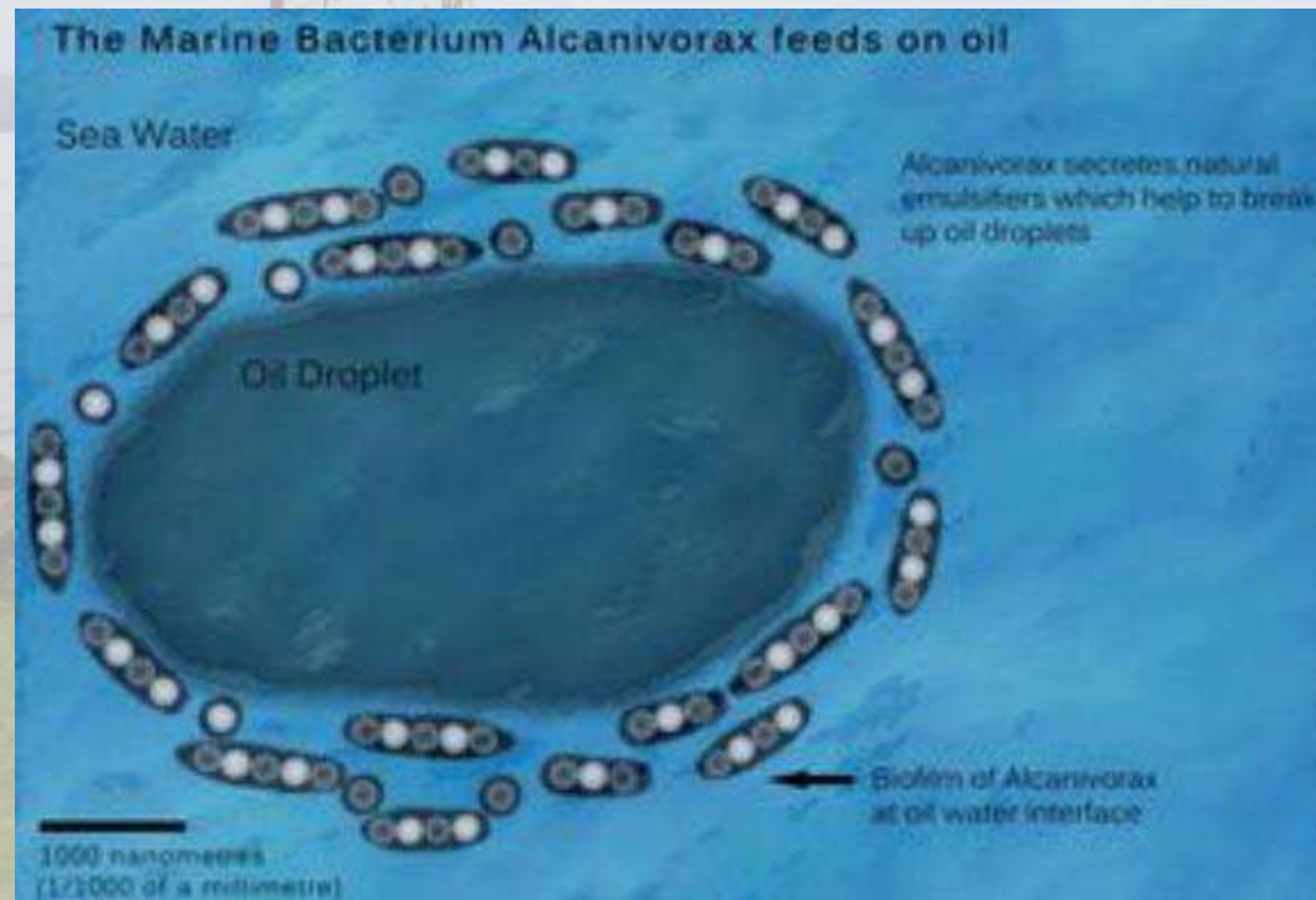
- What are dispersants?
- Oil eating bacteria
- Dispersants toxicity tests
- NEBA/SIMA of dispersant use
- Planning for dispersant use
- Dispersants best practice



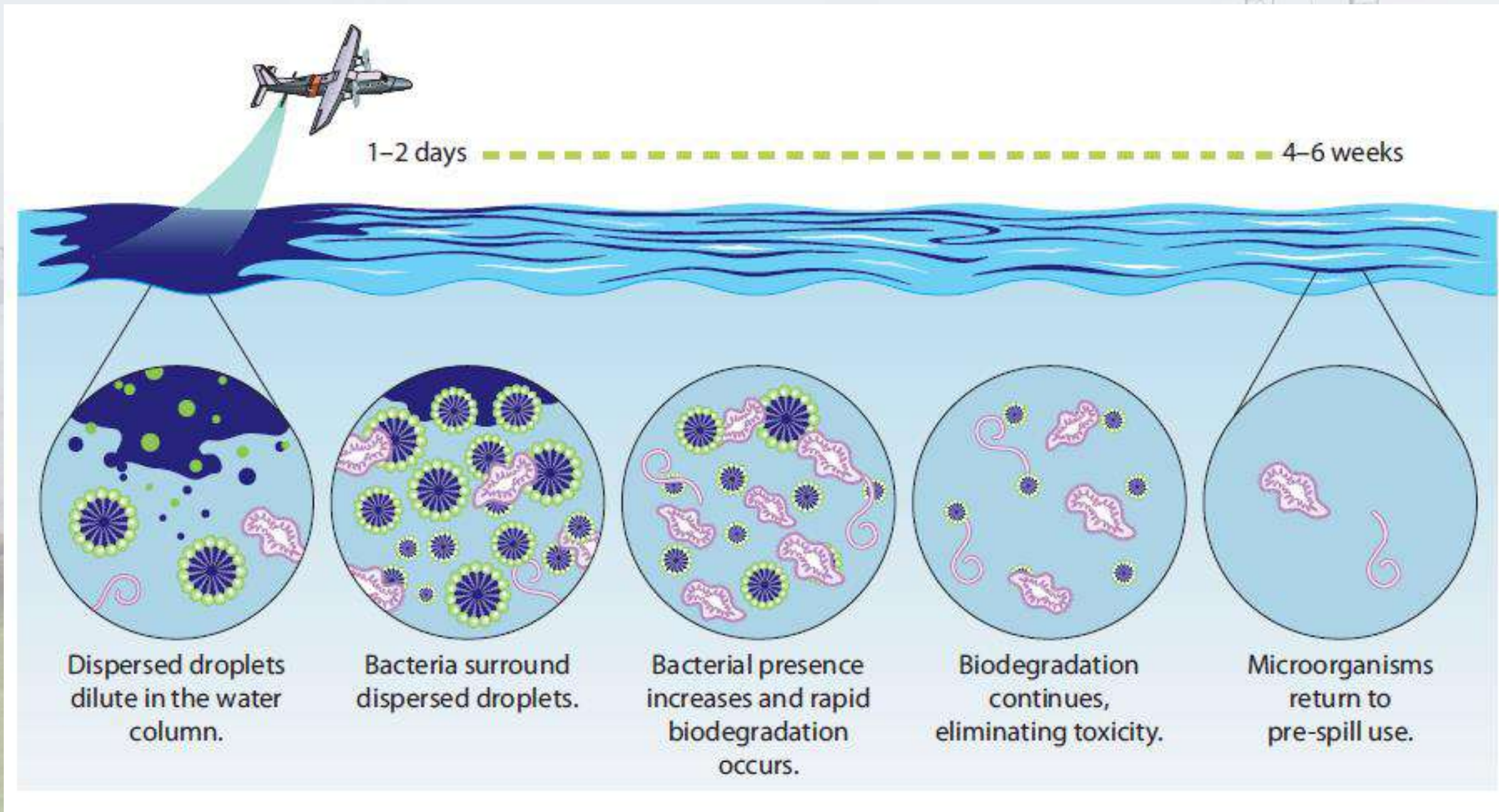
Oil eating bacteria

Dispersants break the large oil slick up in tiny droplets, smaller than a human hair.

Small tiny droplets are easier for bacteria to eat, rather than a large slick



How quickly can the bacteria eat the oil?



Dispersant ingredients

Corexit 9500 Ingredients	Common Day-to-Day Use Examples
Span 80 (surfactant)	Skin cream, body shampoo, emulsifier in juice
Tween 80 (surfactant)	Baby bath, mouth wash, face lotion, emulsifier in food
Tween 85 (surfactant)	Body/Face lotion, tanning lotions
Aerosol OT (surfactant)	Wetting agent in cosmetic products, gelatin, beverages
Glycol butyl ether (solvent)	Household cleaning products
Isopar M (solvent)	Air freshener, cleaner

FIGURE 1.

Example of an LC_{50} test showing the concentration of a chemical that will kill 50 percent of the animals tested.

Source: A. Bejarano, 2012.

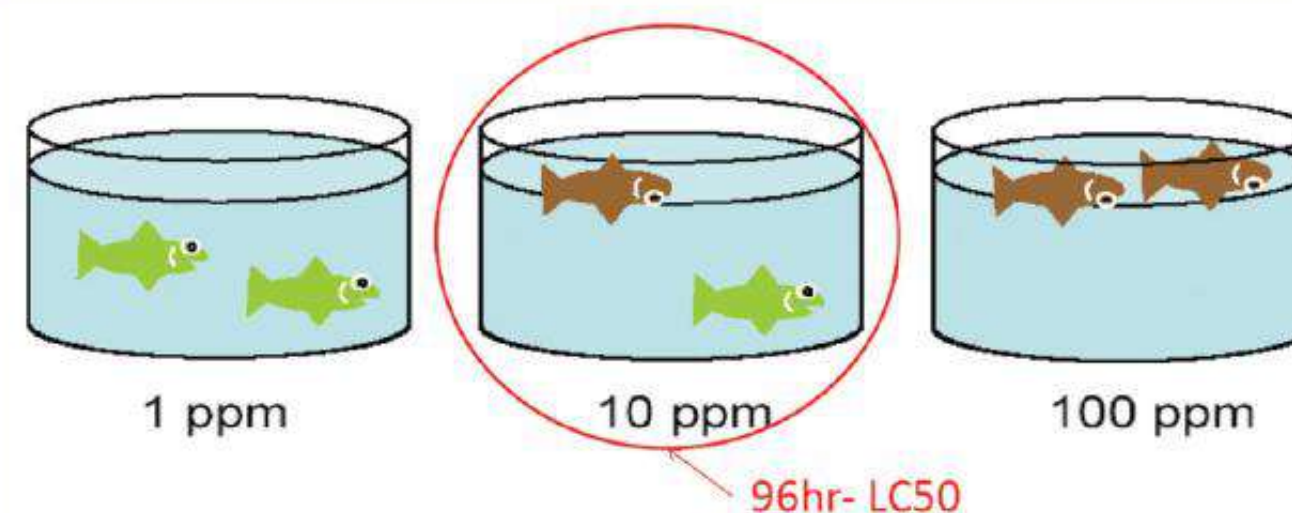


FIGURE 2.

US EPA's LC_{50} aquatic toxicity scale for laboratory-generated aquatic toxicity data. Source: EPA online, 2012.

Very Highly Toxic (<0.1 mg/L or ppm)

Highly Toxic (0.1-1 mg/L or ppm)

Moderately Toxic (1-10 mg/L or ppm)

Slightly Toxic (10-100 mg/L or ppm)

Practically Non-toxic (>100 mg/L or ppm)

Toxicity

VERY HIGHLY TOXIC

HIGHLY TOXIC

MODERATELY TOXIC

SLIGHTLY TOXIC

PRACTICALLY NON-TOXIC

SHRIMP
(MYSID SHRIMP)

SMALL FISH
(MENIDIA BERYLLINA)

SHRIMP
(MYSID SHRIMP)

SMALL FISH
(MENIDIA BERYLLINA)

SHRIMP
(MYSID SHRIMP)

SMALL FISH
(MENIDIA BERYLLINA)

LOUISIANA SWEET
CRUDE OIL (LSC)

COREXIT 9500
(DISPERSANT)

LSC + COREXIT 9500

VERY HIGHLY TOXIC

HIGHLY TOXIC

MODERATELY TOXIC

SLIGHTLY TOXIC

PRACTICALLY NON-TOXIC

COREXIT 9500
(DISPERSANT)

DISH SOAP

BABY
SHAMPOO

LAUNDRY
DETERGENT

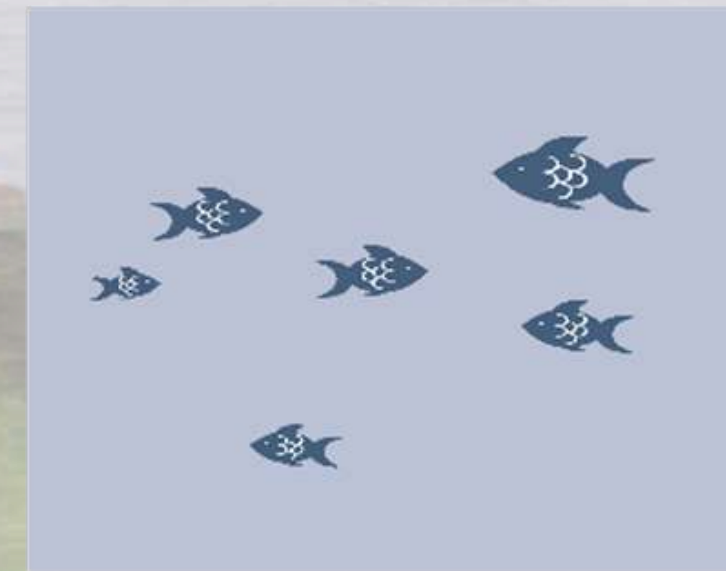
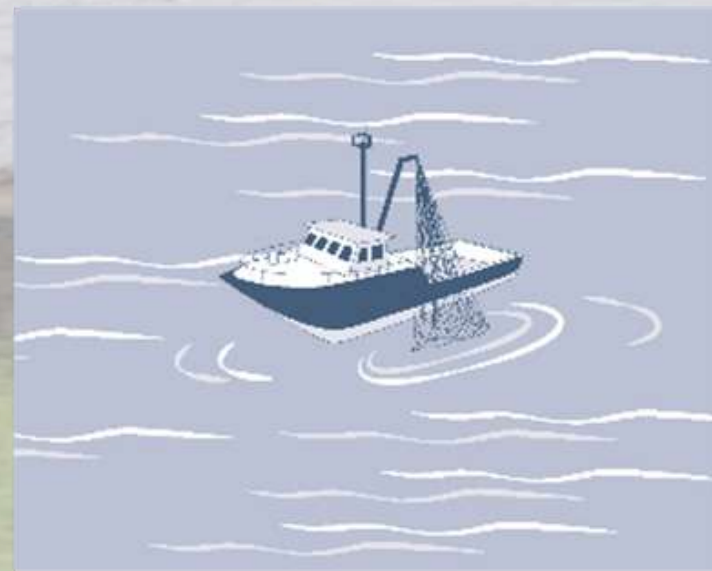
ALL PURPOSE
CLEANER

Dispersants NEBA/SIMA

NEBA

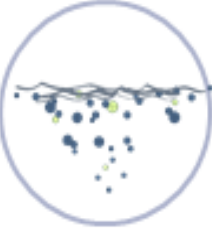
NET ENVIRONMENTAL BENEFIT ANALYSIS (NEBA) AKA SPILL IMPACT MITIGATION ASSESSMENT (SIMA)

IS A PROCESS USED BY THE RESPONSE COMMUNITY FOR MAKING THE
BEST CHOICES TO MINIMIZE IMPACTS OF OIL SPILLS ON PEOPLE AND THE
ENVIRONMENT.



Through the use of NEBA, the oil and gas industry strives to uphold community values and protect community assets with every operational decision.

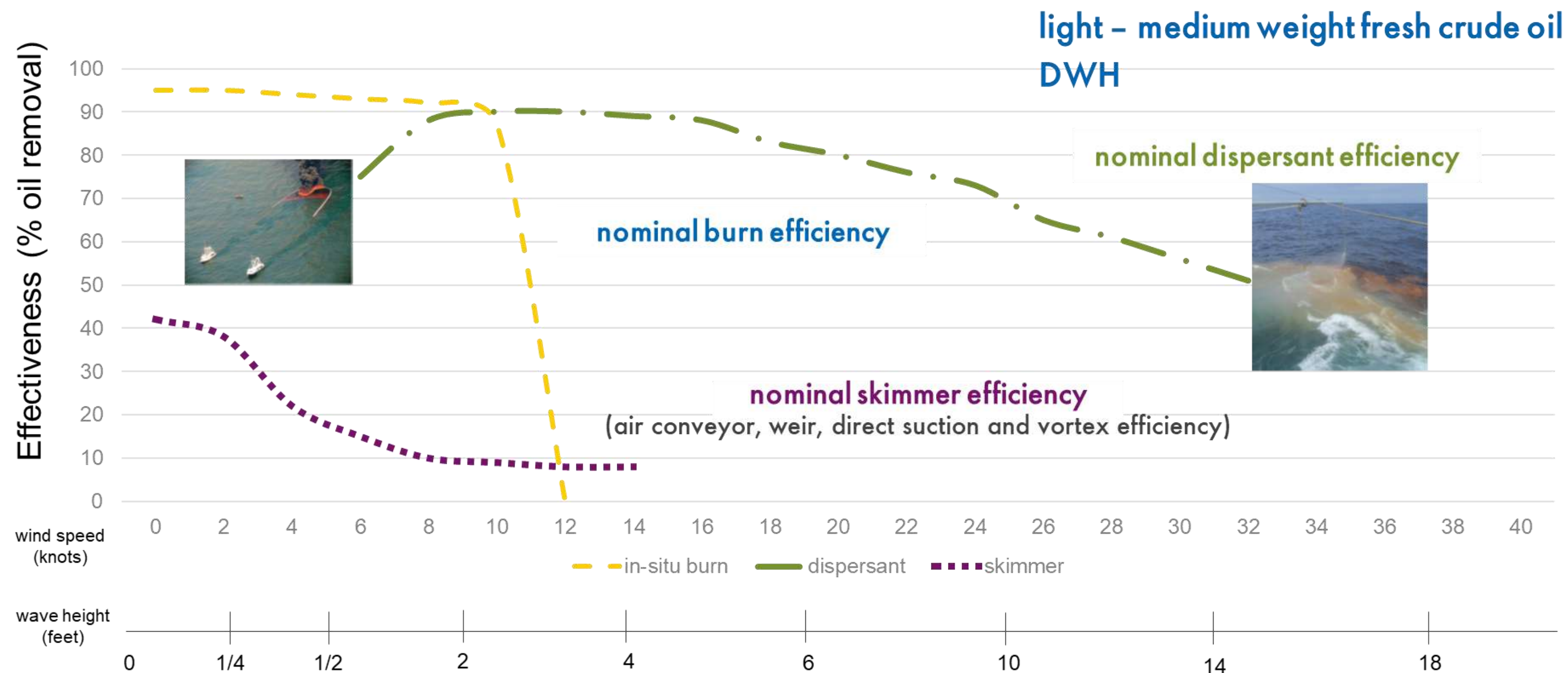
Balancing trade-offs

		BENEFITS	DRAWBACKS
DISPERSANTS		Removes surface oil that could harm wildlife and keeps oil from spreading to shoreline; enhances natural biodegradation of oil and reduces vapors on water surface	Dispersed oil has the potential to affect water column-dwelling wildlife and vegetation
IN-SITU BURNING		Removes large amounts of oil rapidly via controlled burning	Burning presents a potential safety risk and localized reduction of air quality; burn residue can be difficult to recover
MECHANICAL RECOVERY		Removes oil with minimal environmental impact	Mechanical recovery can be inefficient, resource-intensive, and restricted by water conditions, with typically no more than 10-20 percent oil recovery
PHYSICAL REMOVAL		Selectively restores environmental and social value to specific locations using a variety of tools	Aggressive or inappropriate removal methods may impact ecosystems and individual organisms
NATURAL PROCESSES		Takes advantage of natural processes for oil removal, including biodegradation, and avoids intrusive cleanup techniques that may further damage the environment	Natural removal can take more time to achieve pre-spill conditions than other response techniques

Special consideration for dispersant use



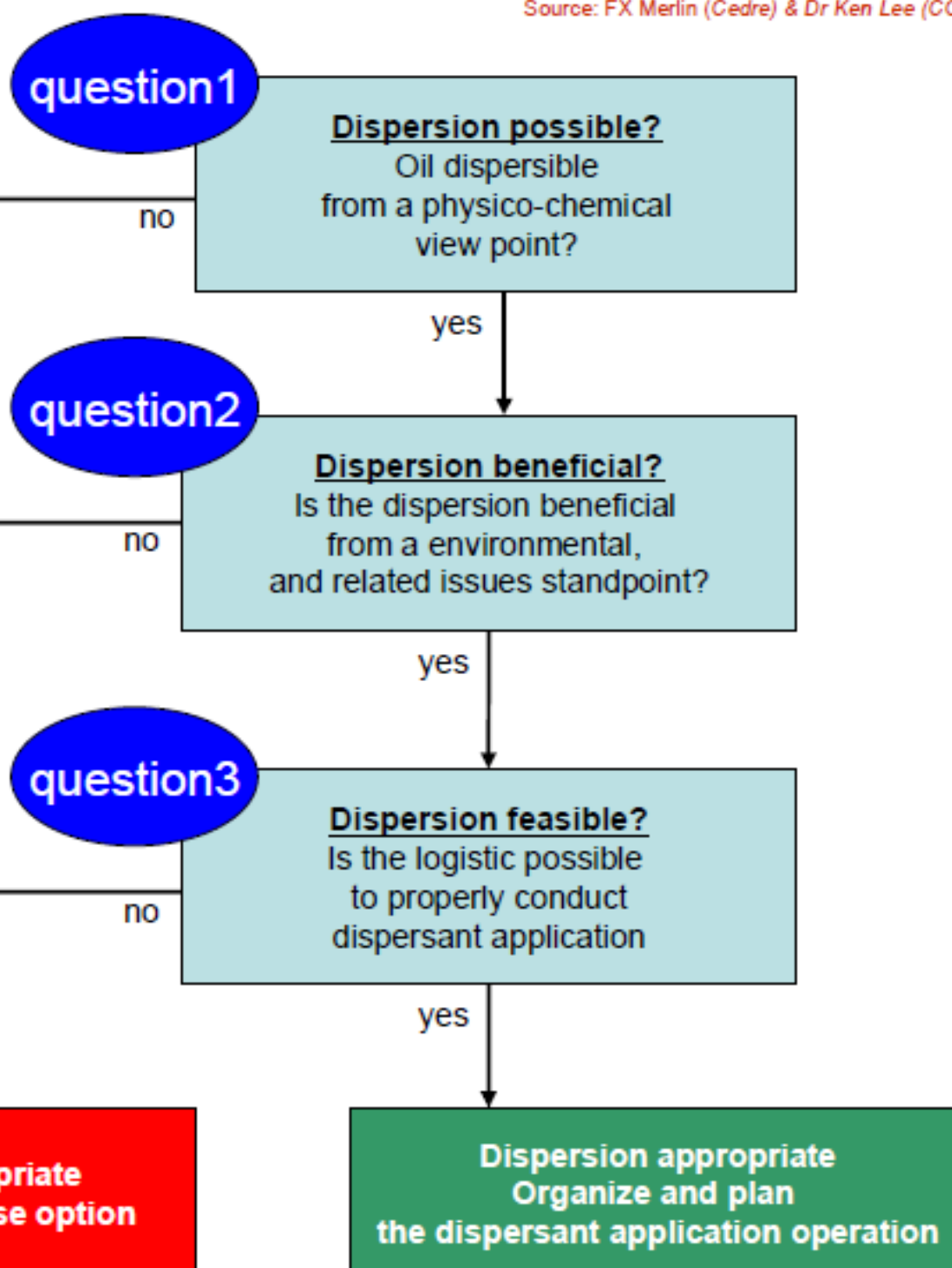
Dispersants as part of the response toolkit



Planning to use dispersants

DECISION MAKING PROCESS

Source: FX Merlin (Cedre) & Dr Ken Lee (COOGER,



Regulator approval of dispersant use through:

1. Dispersant product approval

Describes which dispersants are approved for use, and how dispersants can be added to an approved dispersant list

2. Dispersant use authorization

Describes where and when the approved dispersants may be authorized for use

Information contained in NOSCP or separate dispersant policy

Dispersant Policy

Included in the NOSCP:

YES	13
NO	9

Dispersant Policy

Approval procedure and list of pre-approved dispersant:

YES	8
NO	14

GIWACAF



Middle East
(ROPME
members)
approved
dispersant
list and
application
guide:

Dispersants good practice



ExxonMobil Oil Spill Dispersant Guidelines



Finding 2

Regulatory approval of dispersant products and authorization for their use

IPIECA



Dispersants: subsea application

Good practice guidelines for incident management and emergency response personnel

Using dispersant to treat oil slicks at sea

AIRBORNE AND SHIPBORNE TREATMENT

RESPONSE MANUAL



Dispersants: surface application

Good practice guidelines for incident management and emergency response personnel



IPIECA



Response strategy development using net environmental benefit analysis (NEBA)

Good practice guidelines for incident management and emergency response personnel



OIL SPILL PREVENTION + RESPONSE API

Oil Spill Resources Response Library Quick Facts About Oil Spill News

Prevention Preparedness Cleanup Spill Sources

Cleanup Toolkit Dispersants

Dispersants

Dispersants are chemical agents (similar to soaps and detergents) that help break up an oil slick into very small droplets, which dilute throughout the water. While this does not remove the spilled material, smaller oil particles are more easily biodegraded and it provides a measure of protection for sensitive habitats threatened by a surface slick. Dispersants are sprayed onto spills by specially equipped boats or planes.

Dispersants

Watch later Share

Watch on YouTube

Dispersants Factsheets

- Dispersants Fact Sheet 1 - Introduction to Dispersants
- Dispersants Fact Sheet 2 - Dispersants and Human Health and Safety
- Dispersants Fact Sheet 3 - Fate of Oil and Weathering
- Dispersants Fact Sheet 4 - Toxicity and Dispersants
- Dispersants Fact Sheet 5 - Dispersant Use Approvals in the United States
- Dispersants Fact Sheet 6 - Trade Offs
- Dispersants Fact Sheet 7 - Aerial Vessel

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Dispersant use Cohort

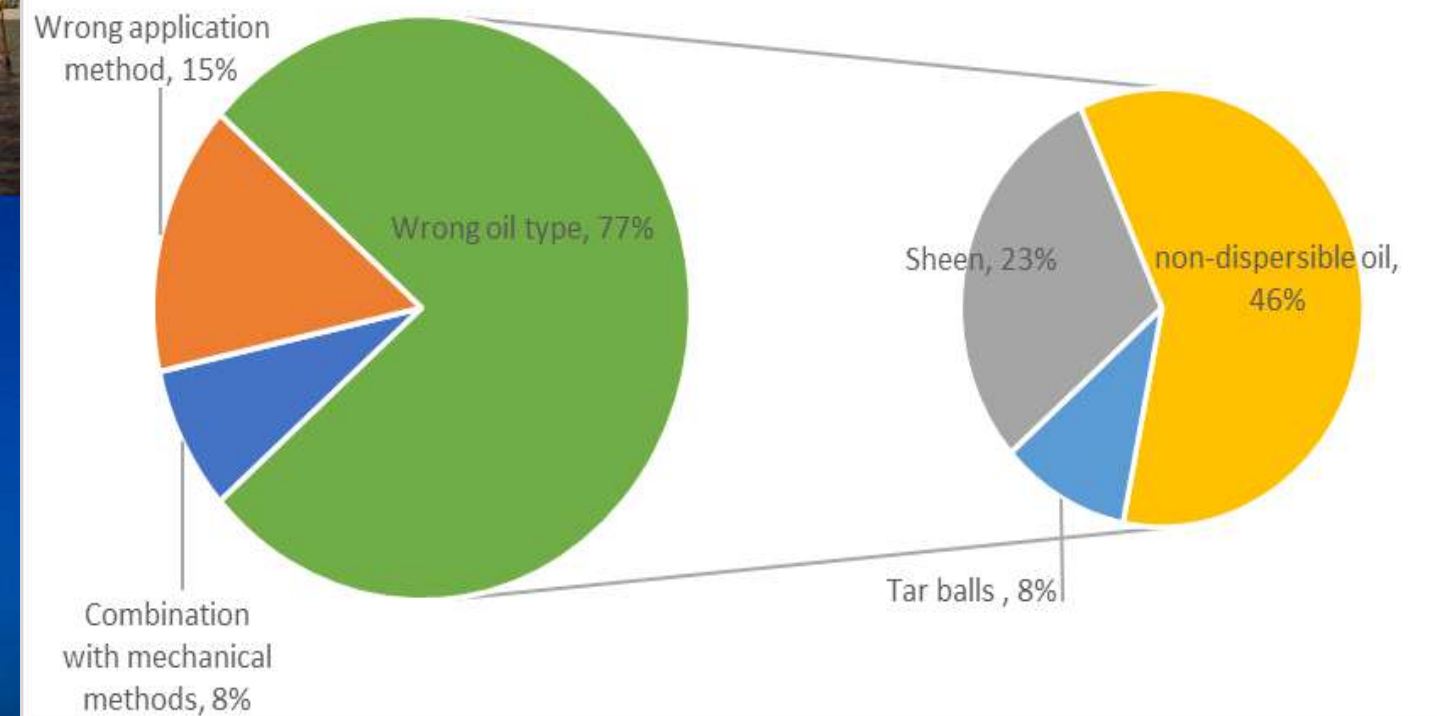
Ensuring appropriate dispersant application



THE GLOBAL OIL AND GAS
INDUSTRY ASSOCIATION
FOR ENVIRONMENTAL
AND SOCIAL ISSUES

www.ipieca.org

Dispersants misuse in incidents attended by ITOPF from 2015 - 2021



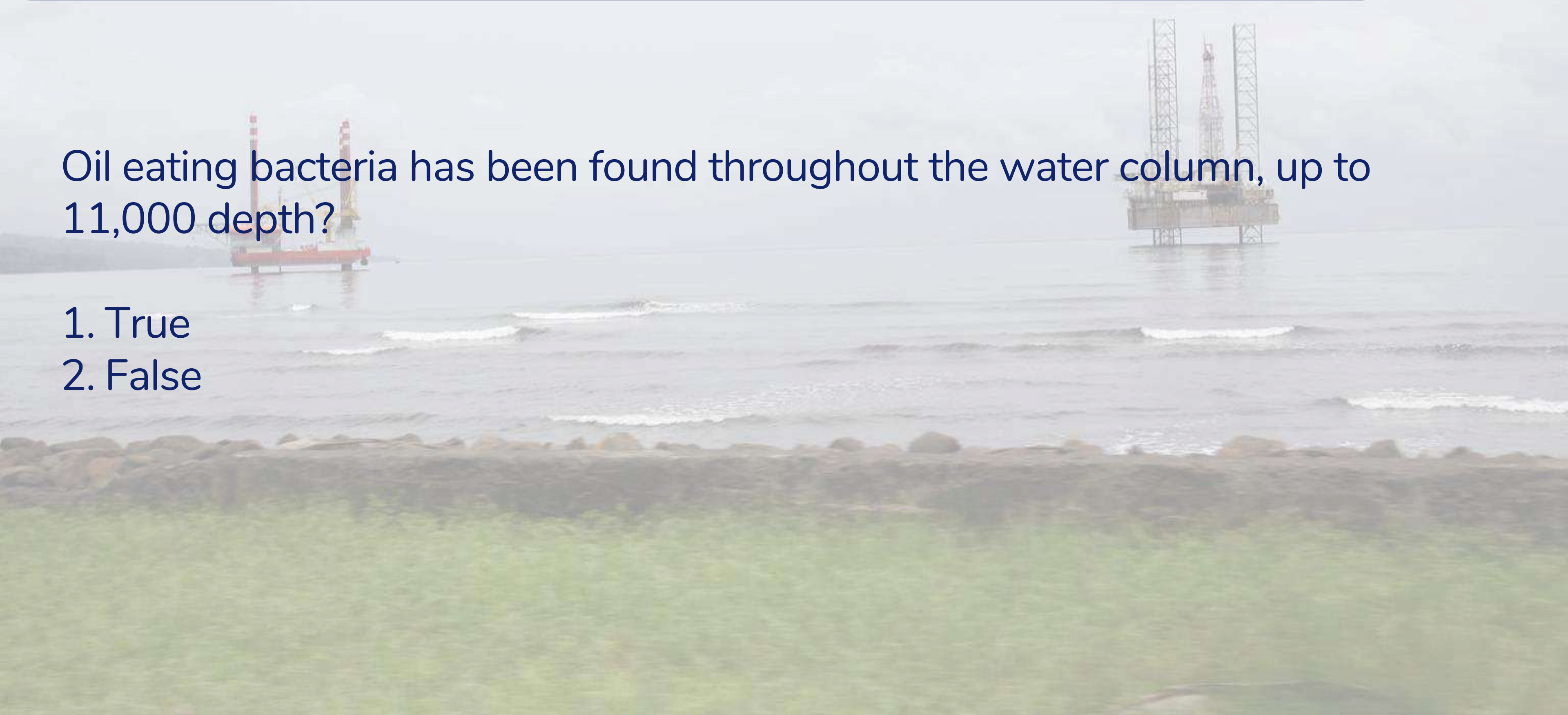
Cohort Purpose

- Develop working group to explore the challenges of dispersant mis-use
- Review communications materials are currently available
- Develop fit for purpose materials for smaller companies who may use dispersants incorrectly.
- Easy access to materials and information for field responders, and for ITOPF and other supporting organisations to 'push' to responders when receiving the first call.

QUIZ

Oil eating bacteria has been found throughout the water column, up to 11,000 depth?

1. True
2. False



QUIZ

Dispersants have the same ingredients in them as baby shampoo, soap and cleaning products?

1. True
2. False