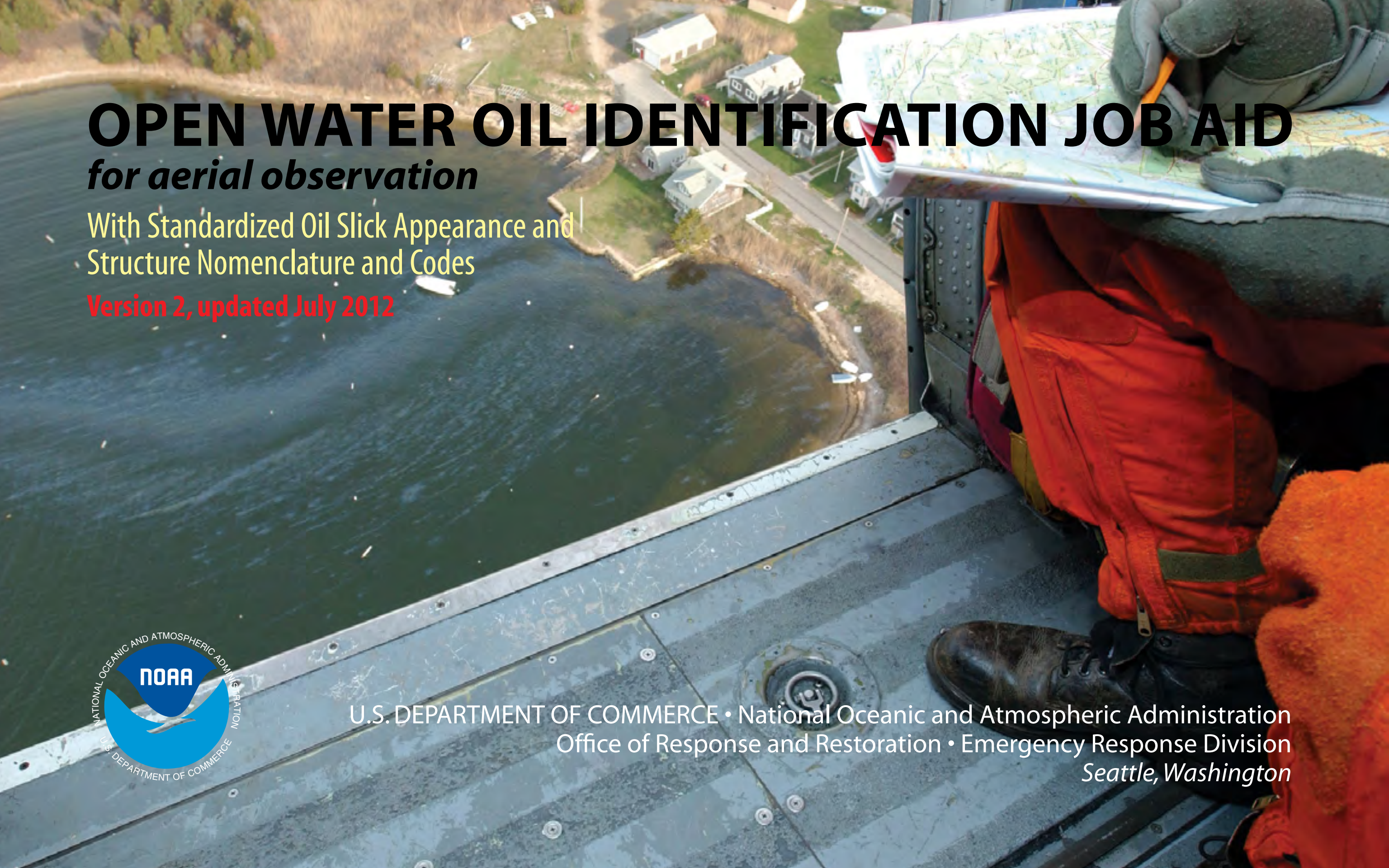

OPEN WATER OIL IDENTIFICATION JOB AID

for aerial observation

With Standardized Oil Slick Appearance and Structure Nomenclature and Codes

Version 2, updated July 2012

U.S. DEPARTMENT OF COMMERCE • National Oceanic and Atmospheric Administration
Office of Response and Restoration • Emergency Response Division
Seattle, Washington

NOAA's Emergency Response Division (ERD) (aka Hazmat) works to reduce risks to coastal habitats and resources from oil and chemical spills and hazardous waste sites. ERD draws on three decades of experience in responding with the U.S. Coast Guard to spill emergencies and resolving the often longer-term problems presented by hazardous waste sites. ERD's response to spill emergencies and waste site problems has gained us a reputation for rapid, yet carefully considered and cost-effective, environmental protection decisions.

This aid was originally a joint project of NOAA and the U.S. Coast Guard. This revision was pursued by the NOAA SSC group led primarily by John Whitney, NOAA SSC for Alaska. Photos were contributed by NOAA, U.S. Coast Guard, Washington Department of Ecology, the Alaska Department of Environmental Conservation, the oil industry, and Alan Allen of Spiltec who deserves special acknowledgement for sharing his knowledge and vast experience on how best to observe oil from the air.

This job aid may be ordered at http://www.response.restoration.noaa.gov/jobaid/orderform.

July 2012

U.S. DEPARTMENT OF COMMERCE
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National Oceanic and Atmospheric Administration
Dr. Jane Lubchenco
Under Secretary of Commerce for Oceans and Atmosphere and
NOAA Administrator

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for Ocean Services and Coastal Zone Management

OPEN WATER OIL IDENTIFICATION JOB AID

Introduction

An important step in oil spill response is assessing color/appearance and structure/distribution of oil spilled on the water. This information is used by the Incident Command to prioritize response and direct cleanup resources. This aid was created to help you perform efficient assessments and communicate your findings effectively. It is intended that the terminology and codes presented in this Job Aid will promote consistency among observers nationwide.

The color, structure/distribution, and consistency of oil on water gives an indication of the type of oil spilled, how long the oil has been on the water, and our ability to contain and/or recover it. When oil enters the water from a source (e.g., a vessel, pipeline, or facility), it initially spreads out and forms a continuous or cohesive patch on the water's surface. This layer or patch of oil absorbs energy and dampens out the surface waves making the area appear smoother or "slick" compared to the surrounding water. As the oil layer becomes thinner, it is more susceptible to being broken up by wave, wind, and current movement into smaller patches and narrow bands, or "windrows," oriented in the direction of the wind or current. Light oils, such as diesel and gasoline, may evaporate and disappear completely. Heavy oils, such as bunker fuels and crude oil, eventually spread out to form smaller, discrete patches or streaks, and may ultimately become tarballs.

This Job Aid is designed to help you characterize the oil and describe what you see in standard terms. You are being asked to observe these properties and report them to the Incident Command. You should concentrate on observing the on-scene weather, the sea state conditions, the location of the spill, and the color and structure/ distribution of the oil. In addition, you might be requested to report on other ancillary on-scene observations that pertain to the response (e.g., location of response equipment, presence of wildlife).

The observation platform — a helicopter (helo), a fixed-wing aircraft, or a vessel — will be determined by a number of different factors. Each platform has advantages and disadvantages. An aircraft (helicopter and fixed-wing) allows a greater overview of the area impacted by an oil spill. Aircraft allow you to reach the scene quicker and investigate the outer edges impacted by a large oil spill. A helo can generally fly slower and at a lower altitude, allowing you a better view of the spill. A vessel, on the other hand, allows a very close look at the oil itself, giving a better feel for its thickness and consistency. A vessel will also allow a closer look to verify whether the spill reported is actually oil or a natural occurrence that resembles an oil spill. Herring spawning, algal blooms, kelp or seagrass beds, and jellyfish are often mistaken for oil. Lastly, a vessel will allow you to sight tarballs formed during a spill, as these are not often visible from an aircraft.

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* The Bonn Agreement Oil Appearance Code (BAOAC) – research conducted by Alun Lewis and SINTEF.

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OIL COLOR AND APPEARANCE TERMS:

Sheen: Sheen is a very thin layer of oil (less than 0.0002 inches or 0.005 mm) floating on the water surface and is the most common form of oil seen in the later stages of a spill. According to their thickness, sheens vary in color from **rainbows**, for the thicker layers, to **silver/gray** for thinner layers, to almost transparent for the thinnest layers.

Metallic: The next distinct oil color, thicker than **rainbow**, that tends to reflect the color of the sky, but with some element of oil color, often between a light gray and a dull brown. **Metallic** is a "mirror to the sky."

Transitional Dark (or True) color: The next distinct oil on water layer thickness after **metallic**, that tends to reflect a **transitional dark** or **true** oil color. At the "Transitional" stage most of the oil will be just thick enough to look like its natural color (typically a few thousandths of an inch, or few hundredths of a millimeter), and yet thin enough in places to appear somewhat patchy.

Dark (or True) Color: Represents a continuous true oil color (i.e., its natural color), commonly occurring at thicknesses of at least a hundredth of an inch (or, a little over a tenth of a millimeter). Oil thickness at this "Dark" stage (especially in a calm and/or contained state) could range over several orders of magnitude. At sea, however, after reaching an equilibrium condition, most oils would not achieve an average thickness beyond a few millimeters. Heavy fuel oils and highly weathered or emulsified oils (especially on very cold water) could, of course, reach equilibrium states considerably greater than a few millimeters.

Emulsified oil or mousse: Water-in-oil mixture that appears as various shades of orange, brown, and/or red. See p. 9 for more information.

OIL STRUCTURE/DISTRIBUTION TERMS:

Streamers: Narrow bands or lines of oil (sheens, dark or emulsified) with relatively clean water on each side. Streamers may be caused by wind and/or currents, but should not be confused with multiple parallel bands of oil associated with windrows, or with convergence zones or lines commonly associated with temperature and/or salinity discontinuities.

Convergence Zone: A long narrow band of oil (and possibly other materials) often caused by the convergence of two bodies of water with different temperatures and/or salinities. Unlike windrows and streamers, commonly associated with wind, convergence zones are normally associated with the interface between differing water masses, or with the effects of tidal and depth changes that cause currents to converge due to density differences or due to large bathymetric changes. Such zones may be several kilometers in length, and consist of dark or emulsified oil and heavy debris surrounded by sheens.

Windrows: Multiple bands or streaks of oil (sheens, dark, or mousse) that line up nearly parallel with the wind. Such streaks (typically including seaweed, foam, and other organic material) are caused by a series of counter rotating vortices in the surface layers that produce alternating convergent and divergent zones. Sometimes referred to as Langmuir vortices (after a researcher in 1938), the resulting windrows begin to form with wind speeds of approximately six knots or more.

Patches: An oil configuration or structure that reflects a broad range of shapes and dimensions. Numerous tarballs could combine to form a "patch"; oil of various colors and consistency could form a patch or single layer 10s of cm to 10s (or even 100s) of meters in diameter; and a large patch of dark or rainbow oil could have patches of emulsion within it. Patches of oily debris, barely able to float with sediment/plants in them, are called "tarmats," circular patches at sea are called "pancakes"; and REALLY BIG patches can simply be called "continuous" slicks. But, they are all patches.

Tarballs: Discrete, and usually pliable, globules of weathered oil, ranging from mostly oil to highly emulsified with varying amount of debris and/or sediment. Tarballs may vary in size from millimeters to 20–30 centimeters across. Depending on exactly how weathered, or hardened, the outer layer of the tarballs is, sheen may or may not be present.

No Structure: Random eddies or swirls of oil at any one or more thicknesses. This distribution of oil is normally the result of little to no winds and/or currents.

OTHER OIL SLICK TERMS:

Black oil: A black or very dark brown-colored layer of oil. Depending on the quantity spilled, oil tends to spread out quickly over the water surface to a thickness of about one millimeter. However, from the air it is impossible to tell how thick a black oil layer is. The minimum thicknesses for a continuous black oil layer would commonly be around a hundredth of an inch or about two tenths of a millimeter. Dark (or Black) oils just begin to look their natural color at around a thousandth of an inch (or, a few hundredths of a millimeter). See chart on page 11.

Dispersion: The breaking up of an oil slick into small droplets that are mixed into the water column as a result of sea surface turbulence. For response purposes, dispersed oil is defined as oil droplets that are too small to refloat back to the surface. The physical properties of the oil and the sea state are the main factors that determine how much oil is dispersed. Chemical dispersants can be used to change the chemical properties of the oil and enhance oil dispersion.

Emulsification: The formation of a water-in-oil mixture. The tendency for emulsification to occur varies with different oils and is much more likely to occur under high energy conditions (winds and waves). This mixture is frequently referred to as "mousse." Emulsification will impact the cleanup by significantly increasing the volume and viscosity of the oil to be collected.

Entrainment: The loss of oil from containment when it is pulled under a boom by the current. Entrainment typically occurs from booms deployed perpendicular to currents greater than 3/4 knot.

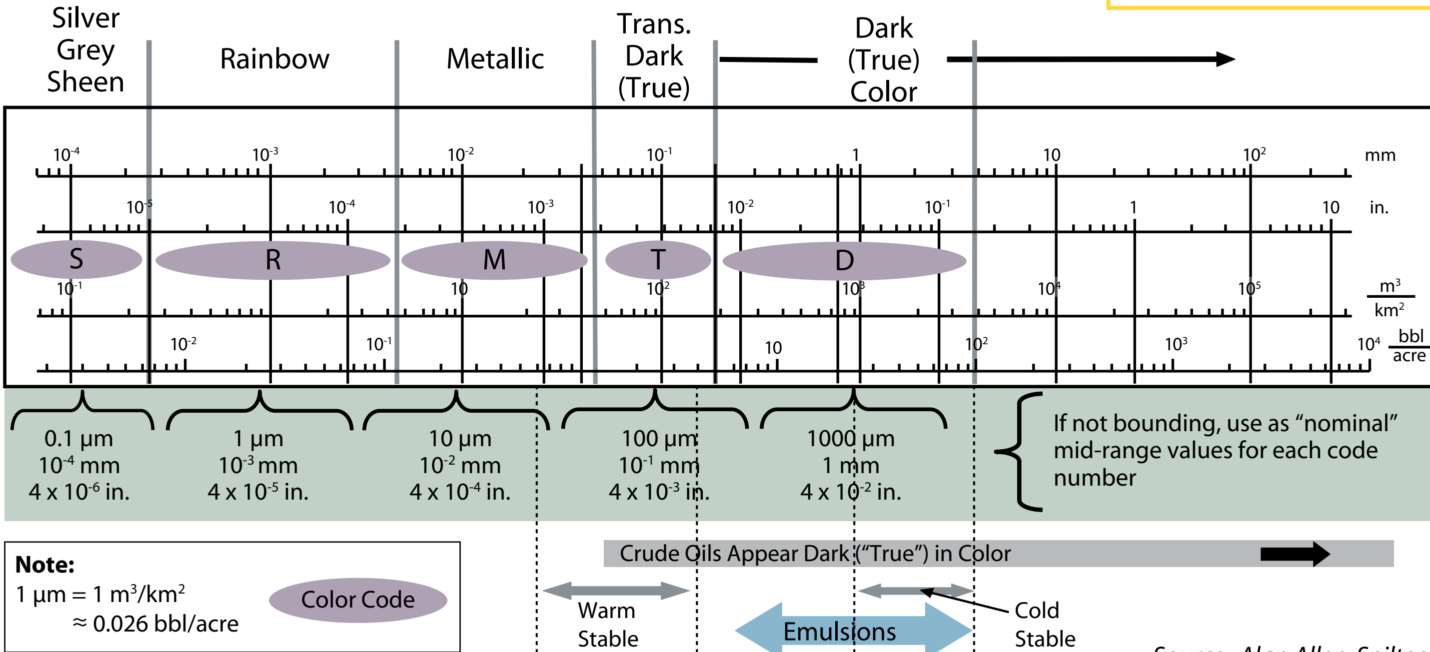
Recoverable Oil: Oil that is in a thick enough layer on the water to be recovered by conventional techniques and equipment. Only black or dark brown oil, mousse, and heavy metallic layers are generally considered thick enough to be effectively recovered by skimmers. Thinner films may be recoverable with sorbents and/or concentrated with booms or chemical herders to enhance their recovery. As a rule of thumb, quite often about 90% of the oil slick volume is in 10% of the observable slick area.

Slick: Oil spilled on the water that absorbs energy and dampens out the surface waves making the oil appear smoother or "slicker" than the surrounding water. Slicks refer to oil layers that are thicker than Rainbow and Silver/Gray sheens. Natural slicks from plants or animals also may occur on the water surface and may be mistaken for oil slicks.

Weathering: A combination of physical and environmental processes such as evaporation, dissolution, dispersion, photo-oxidation, and emulsification that act on oil and change its physical properties and composition.

Oil Code Color, Thickness, and Concentration Values

See volume estimate cautions on page 13.



Source: Alan Allen, Spiltec

The BONN (BAOAC) Data – Metric & English Units

Note the use of Capital letters for color codes (S, R, M, T, D, and E); this will make it easier creating and interpreting sketches by aerial observers.

See volume estimate cautions on page 13.

Code	Description	Layer-Thickness Interval microns (µm)	Layer-Thickness Interval inches (in.)	Concentration m^3 per Km^2	Concentration bbl/acre
S	Sheen (silver/gray)	0.04 – 0.30	1.6×10^{-6} – 1.2×10^{-5}	0.04 – 0.30	1×10^{-3} – 7.8×10^{-3}
R	Rainbow	0.30 – 5.0	1.2×10^{-5} – 2.0×10^{-4}	0.30 – 5.0	7.8×10^{-3} – 1.28×10^{-1}
M	Metallic	5.0 – 50	2.0×10^{-4} – 2.0×10^{-3}	5.0 – 50	1.28×10^{-1} – 1.28
T	Transitional Dark (or True) Color	50 – 200	2.0×10^{-3} – 8×10^{-3}	50 – 200	1.28 – 5.1
D	Dark (or True) Color	>200	$> 8 \times 10^{-3}$	>200	> 5.1
E	Emulsified	Thickness range is very similar to dark oil.			

Chart from Bonn Agreement Oil Appearance Code (BAOAC) May 02, 2006, modified by A. Allen.

A Word of Caution Regarding Volume Estimates

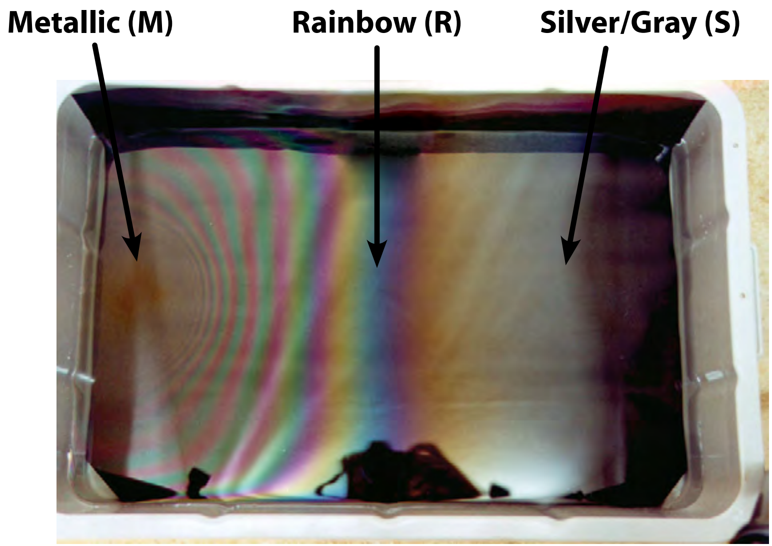
Oil thickness/volume estimates from aircraft observations have high uncertainty due to a variety of environmental and observational variables (e.g., weather, visibility conditions, view angle, oil type, water conditions, presence of waves, and the presence of other material on the water surface). Therefore, it is important to treat these as rough estimates and, where possible, give ranges of thicknesses. If volume is to be calculated from them, it should also be given as a range of values.

For oil sheens (not dark oil), a volume estimate to within an order of magnitude may be possible. However, operationally, an estimate of the sheen volume has little value for a total spill volume estimate, since the majority of the oil will be in the optically thick (dark or true color) portion, which cannot be accurately estimated by visual observation. Rather, careful mapping of the areal extent of thick oil will be more useful to the response team in planning, directing skimmers, and boom placement. For total spill volume estimation, responders should look to other methods, if available.

Although other aerial oil thickness standards exist (such as ASTM F-2534-06), the modified Bonn standards, presented in this NOAA Job Aid are more descriptive of the colors typically observed from aircraft. Additionally, these standards have become widely used and taught throughout the response community. In NOAA's experience, use of these standards promotes observational simplicity, uniformity, consistency, and clearer communication in describing the appearance and structure of an oil slick. Therefore, NOAA continues to support and advocate the nomenclature, codes, and general volume ranges presented in this Job Aid.

Silver/Gray (S), Rainbow (R) Sheen, and Metallic (M) Oil Colors

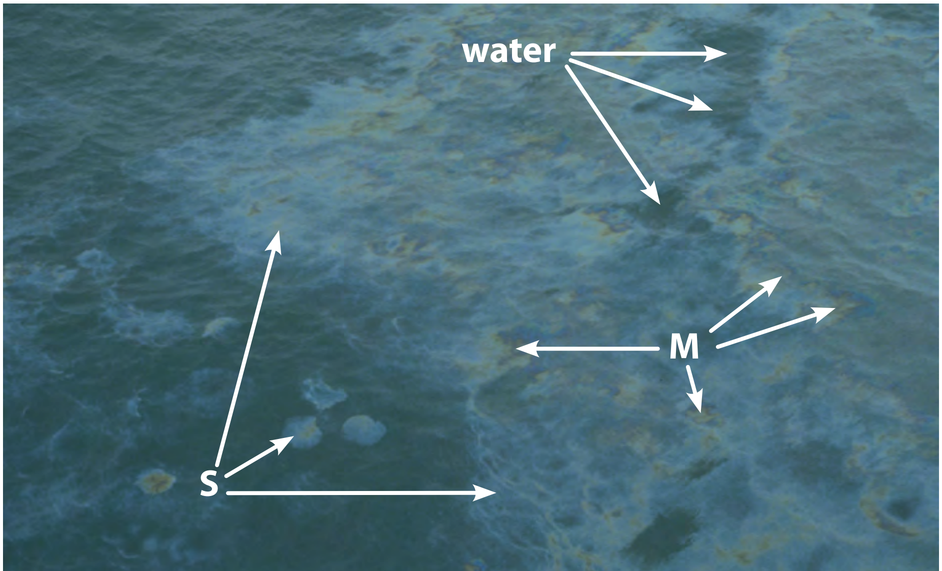
Patches of **silver/gray (S)**, **rainbow (R)**, and **metallic (M)** dull brown sheens.



Source: Alun Lewis & SINTEF (Dec. 2002)

SHEEN SURFACING FROM SUNKEN VESSEL

Patches of **silver/gray (S)** and minimal amounts of **rainbow (R)** and **metallic (M)** dull brown sheens.



Observation altitude:
50 – 100 ft.

Platform:
Helo

Oil coverage:
60%

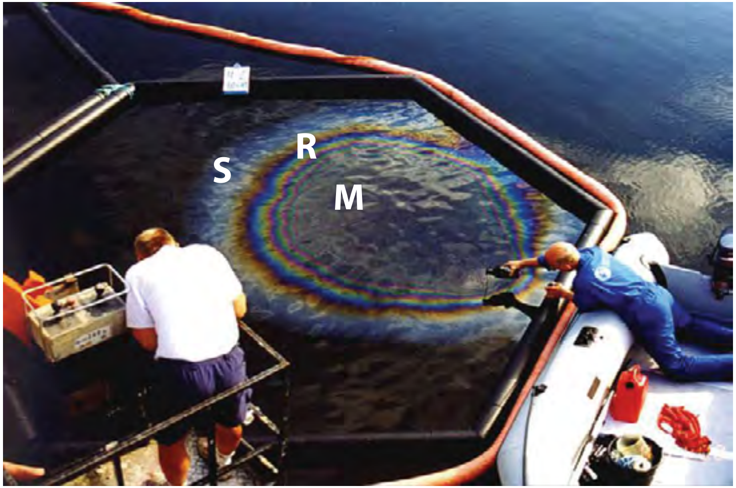
METALLIC (M) OIL SLICK COLOR/APPEARANCE

Oil layers that look metallic reflect the color of the sky, but with some element of oil color.



Source: Alun Lewis & SINTEF (Dec. 2002)

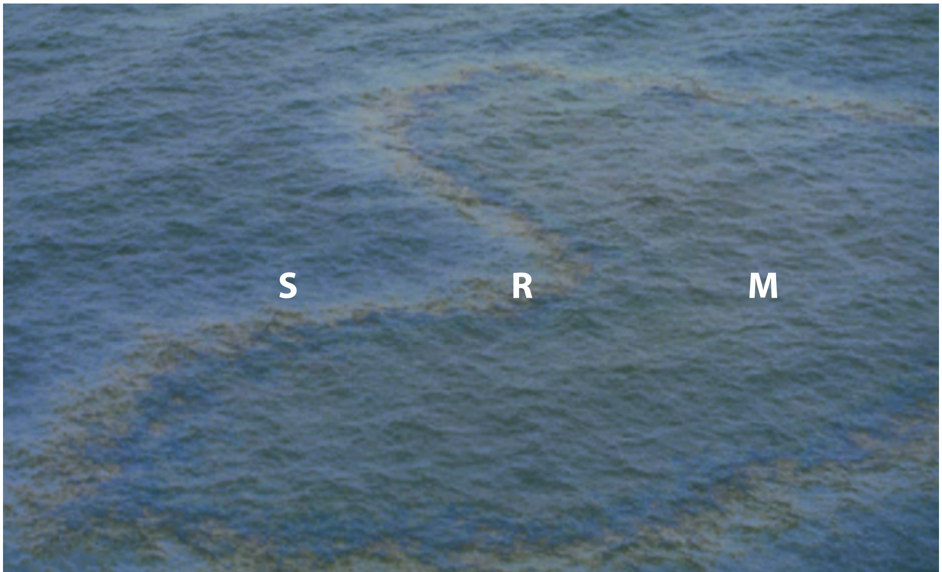
SILVER/GRAY SHEEN (S), RAINBOW (R), AND METALLIC (M) OIL COLORS



Source: Alun Lewis & SINTEF (Dec. 2002)

FRESH DIESEL SLICK

Metallic (M) dull brown slick in center fading to **rainbow (R)** and **silver/gray (S)** along the edges.



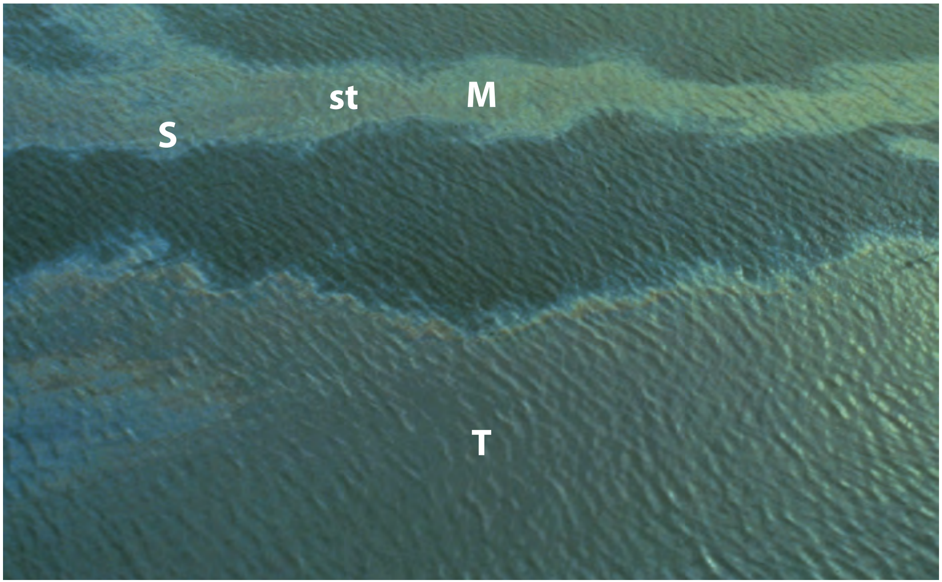
Observation altitude:
300 ft.

Platform:
Helo

Oil coverage:
70%

PATCH OF TRANSITIONAL (T) OIL

Transitional (T) oil color patch in bottom half of photo separated from **streamer (st)** of **metallic (M)** oil (top of photo) by clean water. Note light **silver/gray (S)** sheen along edges.



Observation altitude:
300 ft.

Platform:
Helo

Oil coverage:
60 – 70%

BLACK DARK (D) OIL LEAKING FROM BARGE

Black **dark (D)** oil forming **streamer (st)** from barge.

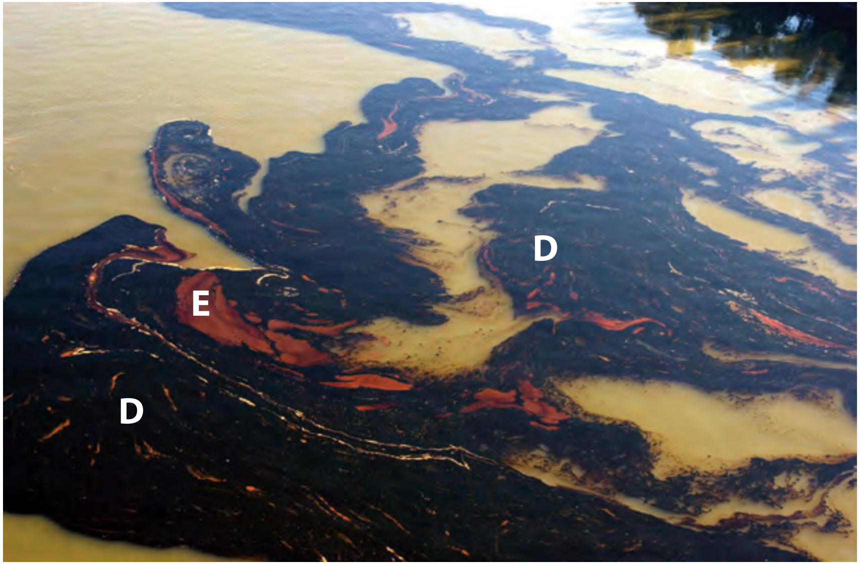
Observation altitude:
400 ft.

Platform:
Helo

Total slick dimension:
15 yds. x 500 yds.

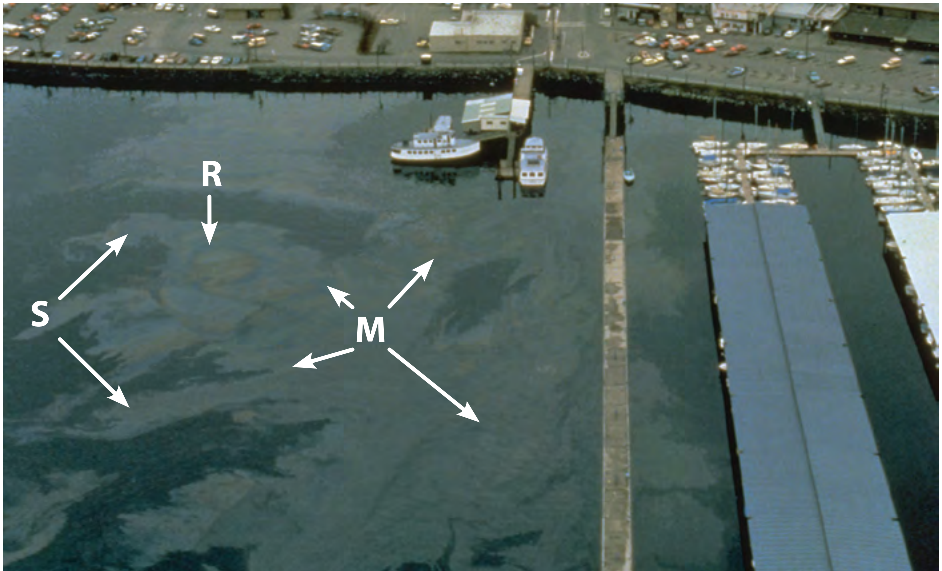
BLACK DARK (D) OIL ON THE MISSISSIPPI RIVER

Note the small orangish streaks and patches of **emulsified (E)** oil. A true or **dark (D)** oil can have a thickness greater than 200 microns, giving volume estimates a very large range. This has a **no structure (ns)** slick configuration.



DIESEL SPILL IN MARINA

Oil spreading out into **metallic (M)** or dull brown layer, **rainbow (R)** and **silver/gray (S)** sheens in and around piers. Very light wind and currents.



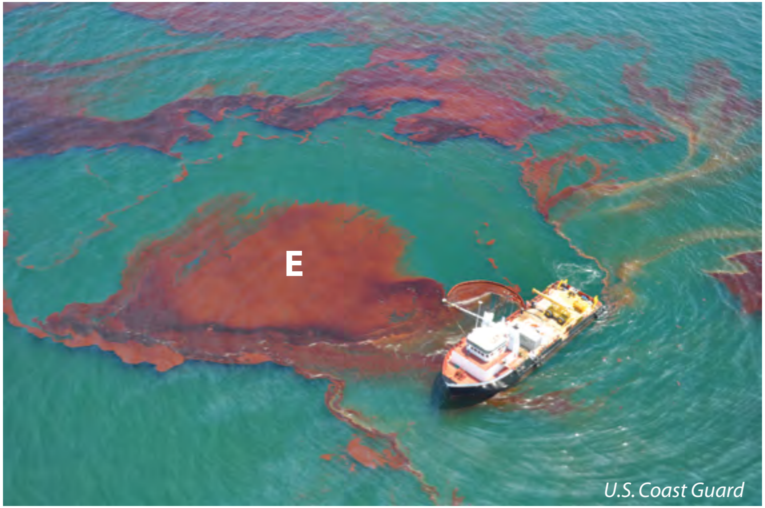
Observation altitude:
500 ft.

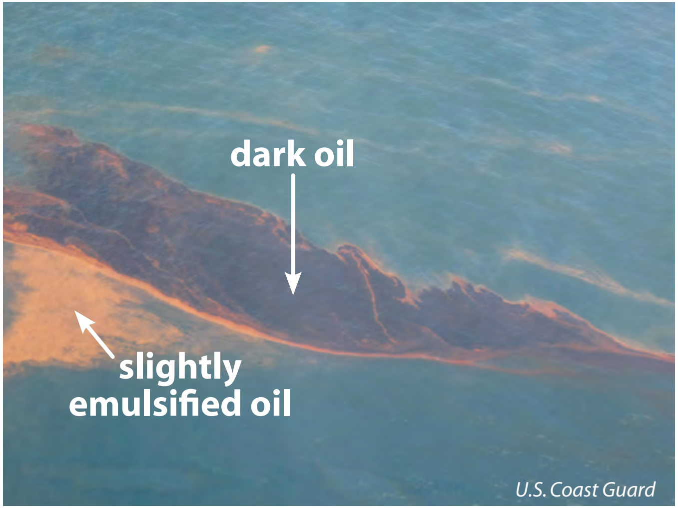
Platform:
Helo

Oil coverage:
50% (with respect to entire water surface in photo)

EMULSIFIED (E) OIL

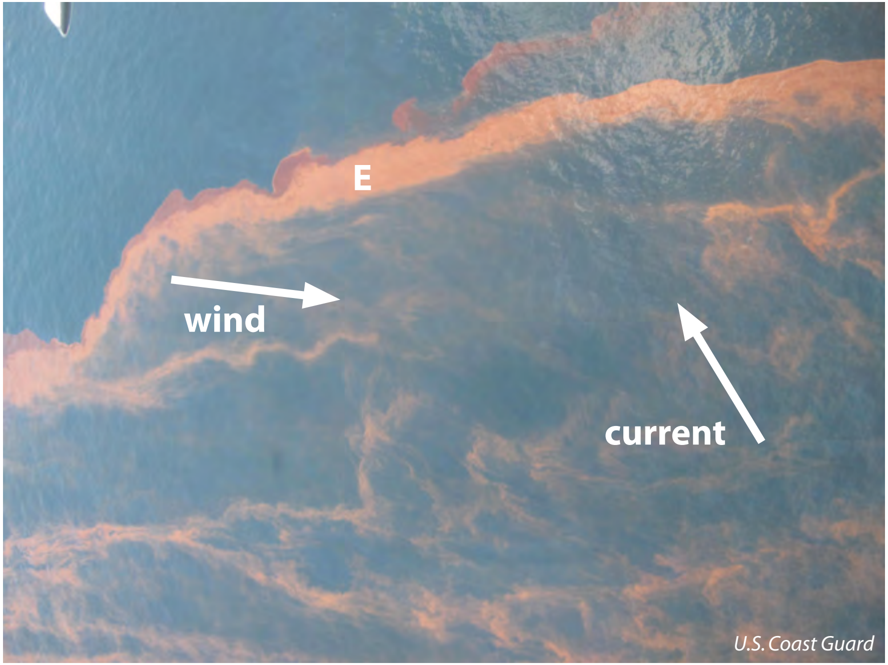
These photos shows various stages of emulsification, seen as different shades of brown. Slightly **emulsifed (E)** oil is lighter brown and **emulsified (E)** oil is darker brown. Photos from the Deepwater Horizon MC-252 oil spill in the Gulf of Mexico, 2010.





EMULSIFIED (E) OIL – LEADING EDGE

This type of streamer occurs when the current and the wind oppose each other. The current affects the oil more than the wind. When the oil is affected by the wind at an opposing angle, the oil tends to re-coalesce and thicken at the leading edge. So the oil gathers on the front edge and feathers on the back portion of the slick.



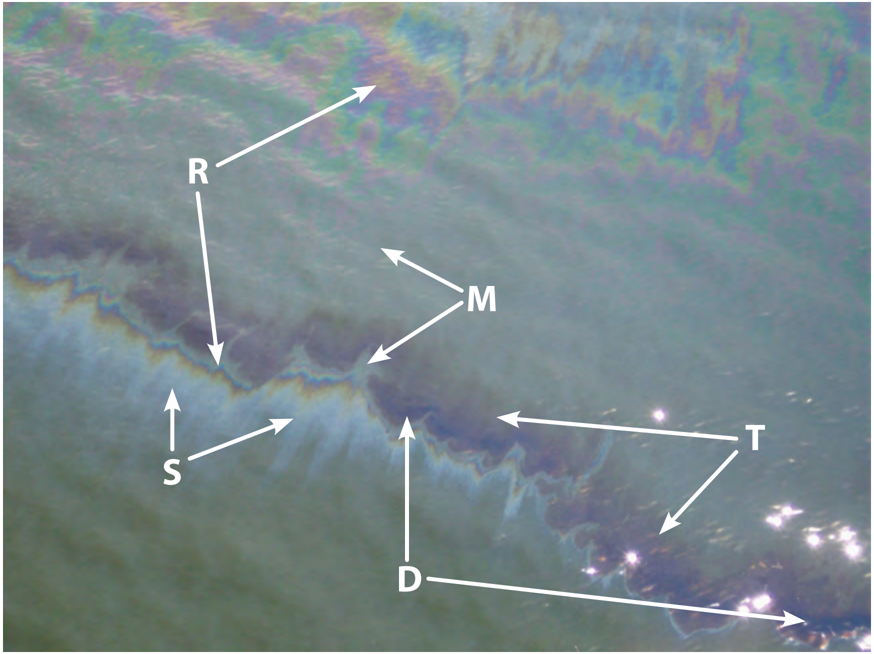
RED-DYED DIESEL ON WATER

The U.S. has a two-tiered diesel system such that diesel used for highway vehicles has a special tax while diesel used for vessels, farm equipment, etc. is exempt from that tax. Often the latter is dyed red and can appear on water as shown by these two photos.

SUMMARY: FIVE PRIMARY COLOR CODES

Common Descriptors	Code
Silver Sheen	S
Rainbow	R
Metallic	M
Transition	T
Dark	D
Emulsified	E

Note: "Structure" uses two lower-case letters, and "Color Codes" use single-letter capitals (R, S, M, T, D, E).



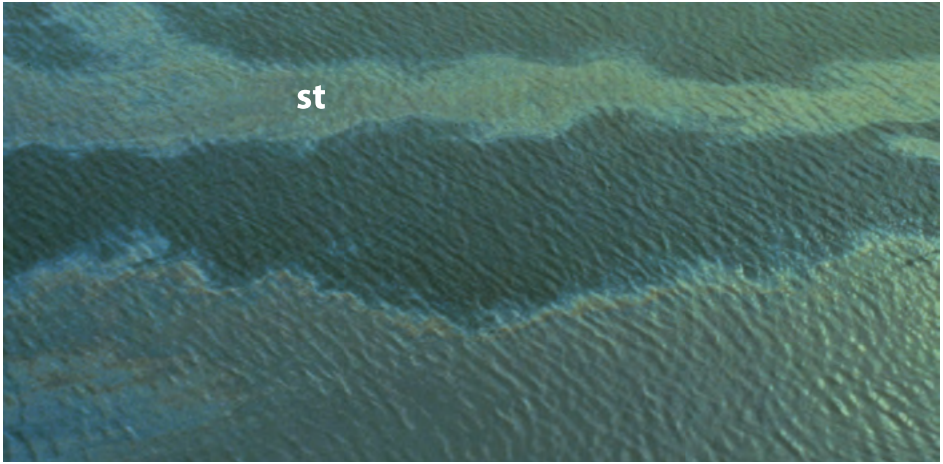
STRUCTURE/DISTRIBUTION CODES

Common Descriptors	Code
Streamers	st
Convergence Line	co
Windrows	wr
Patches	pa
Tarballs	tb
No Structure (random eddies or swirls)	ns

Note: "Structure" uses two lower-case letters, and "Color Codes" use single-letter capitals (R, S, M, T, D, E).

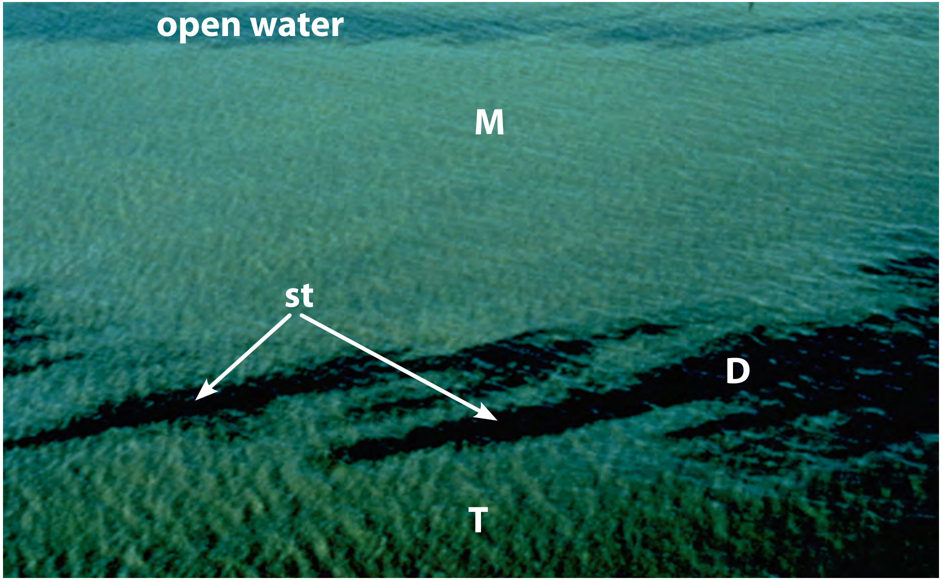
STREAMERS (st)

Narrow bands or lines of oil (sheens, dark or emulsified) with clean water on each side. Sometimes referred to as "fingers" or "ribbons." **Streamers (st)** may be caused by wind and/or currents, but should not be confused with multiple parallel bands of oil associated with "windrows," or with "convergence zones or lines" commonly associated with temperature and/or salinity discontinuities.



STREAMERS (st) OF BLACK OIL

Streamers (st) of **black oil (D)** are breaking up into **windrows (wr)**. Note **transitional (T)** and **metallic (M)** oil layers.



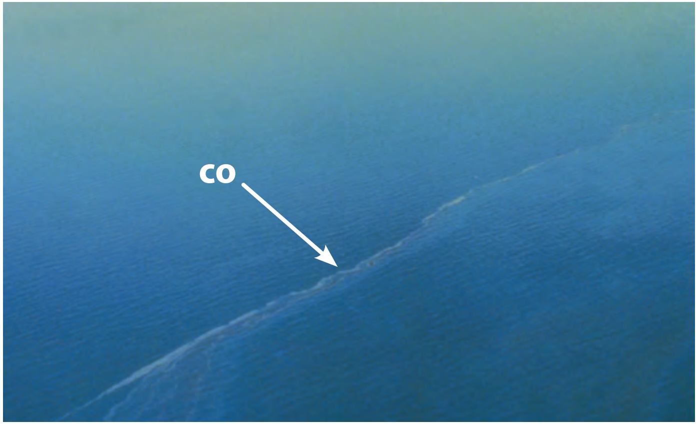
Observation altitude:
300 ft.

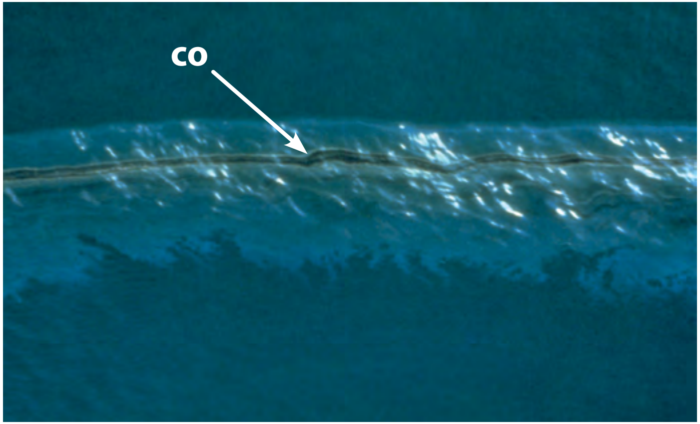
Platform:
Helo

Oil coverage:
15 – 20%

CONVERGENCE ZONE (co)

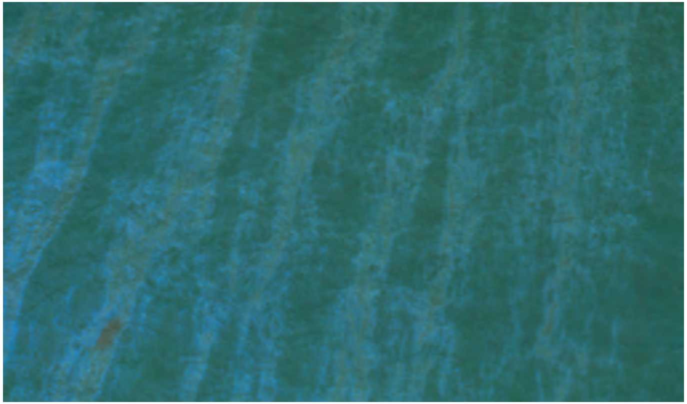
A long narrow band of oil (and possibly other materials) often caused by the convergence of two bodies of water with different temperatures and/or salinities. Unlike "windrows" and "streamers," commonly associated with wind, convergence zones are normally associated with the interface between differing water masses, or with the effects of tidal and depth changes that cause currents to converge due to density differences or due to large bathymetric changes. Such zones may be several kilometers in length, and consist of **dark (D)** or **emulsified (E)** oil and heavy debris surrounded by sheens.





WINDROWS (wr)

Multiple bands or streaks of oil (sheens, dark, or mousse) that line up nearly parallel with the wind. Such streaks (typically including seaweed, foam, and other organic material) are caused by a series of counterrotating vortices in the surface layers that produce alternating convergent and divergent zones. Sometimes referred to as Langmuir vortices (named after a researcher in 1938), the resulting "windrows" begin to form with wind speeds of approximately 6 knots or more. Bands are usually spaced a few meters to tens of meters apart; however, windrows have been observed with spacings of 100 meters or more.

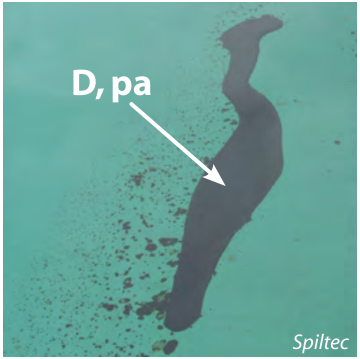


Al Allen, Spiltec

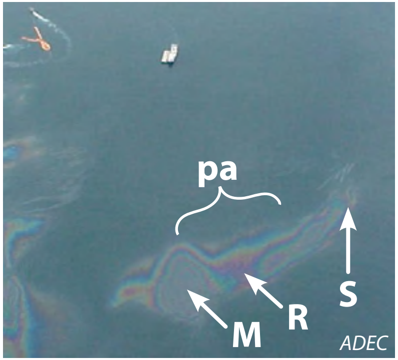
PATCHES (pa)

An oil configuration or structure that reflects a broad range of shapes and dimensions. Numerous tarballs could combine to form a patch; oil of various colors and consistency could form a patch or single layer tens of centimeters to tens (or even hundreds) of meters in diameter; and a large patch of dark or rainbow oil could have patches of emulsion within it. Patches of oily debris, barely able to float with sediment/plants in them, are called "tarmats"; circular patches at sea are called "pancakes"; and REALLY BIG patches can simply be called "continuous" slicks. But, they are all patches.

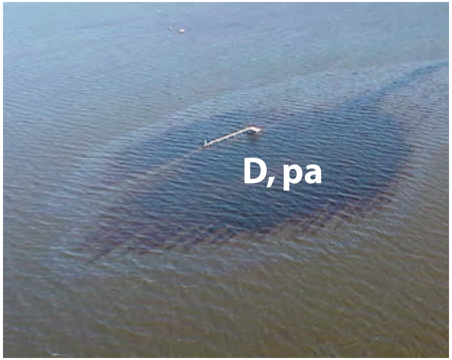
1 meter (crude oil)



50 meters (diesel)



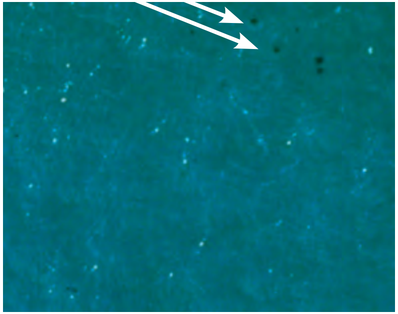
200 meters (crude oil)



TARBALLS (tb)

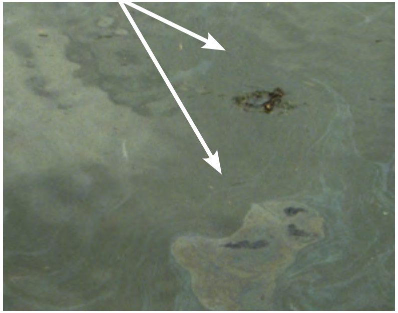
Discrete, and usually pliable, globules of weathered oil, ranging from mostly oil to highly emulsified with varying amount of debris and/or sediment. **Tarballs (tb)** may vary in size from millimeters to 20–30 centimeters across. Depending on exactly how "weathered," or hardened, the outer layer of the **tarballs (tb)** is, sheen may or may not be present.

Fist-sized tarballs



From helicopter (25–50 ft altitude)

Tarballs 1–5 cm



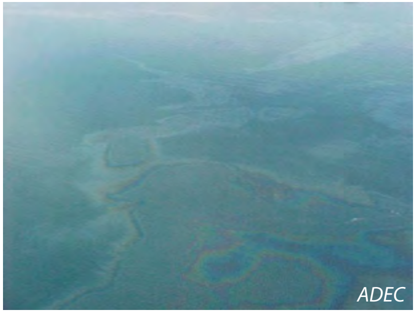
From boat

Tarballs 5 mm – 5 cm

From ground level on beach

NO STRUCTURE (ns)

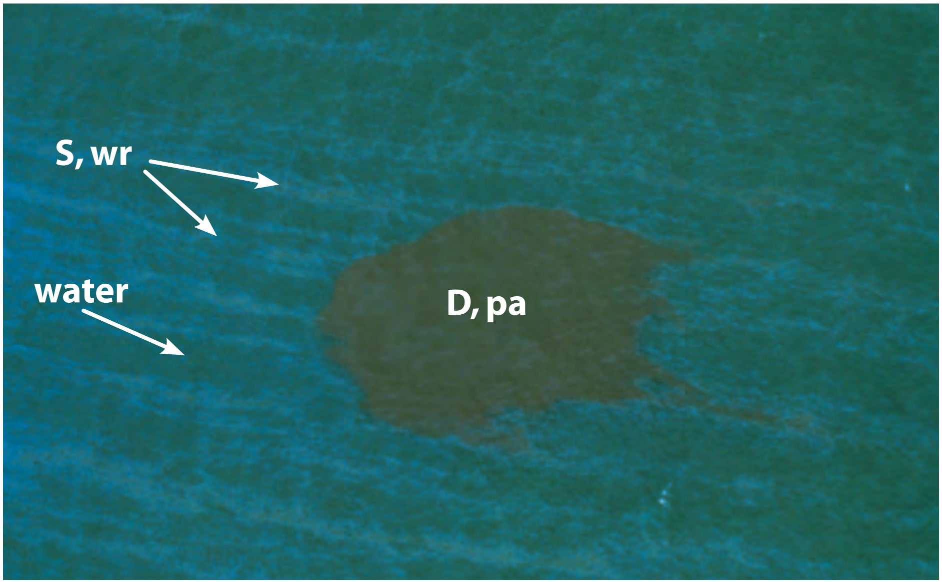
Random eddies or swirls of oil at any one or more thicknesses. This distribution of oil is normally the result of little to no winds and/or currents.


ADEC


ExxonMobil

PATCH (pa) OF DARK (D) OIL

Isolated **patch (pa)** or pancake of **dark (D)** oil surrounded by **windrows (wr)** of **silver/gray (S)** sheen.



Observation altitude:
300 ft.

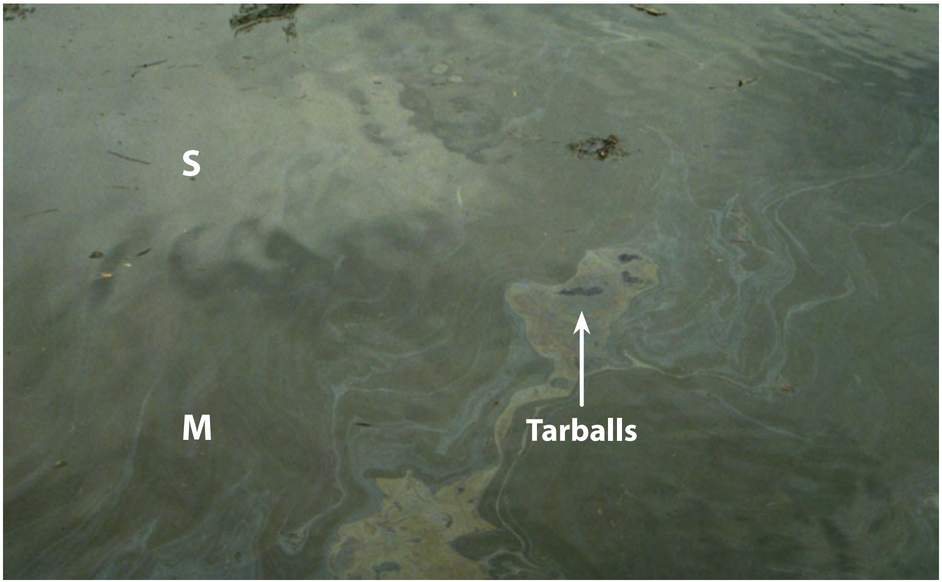
Platform:
Helo

Oil coverage:
40% total (sheen & emulsified oil)

Pancake 65 ft. in diameter

TARBALLS (tb) VIEWED FROM BOAT

Dime to silver dollar-sized **tarballs (tb)** surrounded by dull-brown or **metallic (M)** and **silver/gray (S)** sheen.



Observation altitude:
Surface

Platform:
Boat

Photo examples of water and biological phenomena that may be observed and may tend to be mistaken for oil. If in doubt, inspect more closely at a lower altitude. Most oil spills will have a sheen around the edges, helping sort out the spills from the false positives.

KELP BED

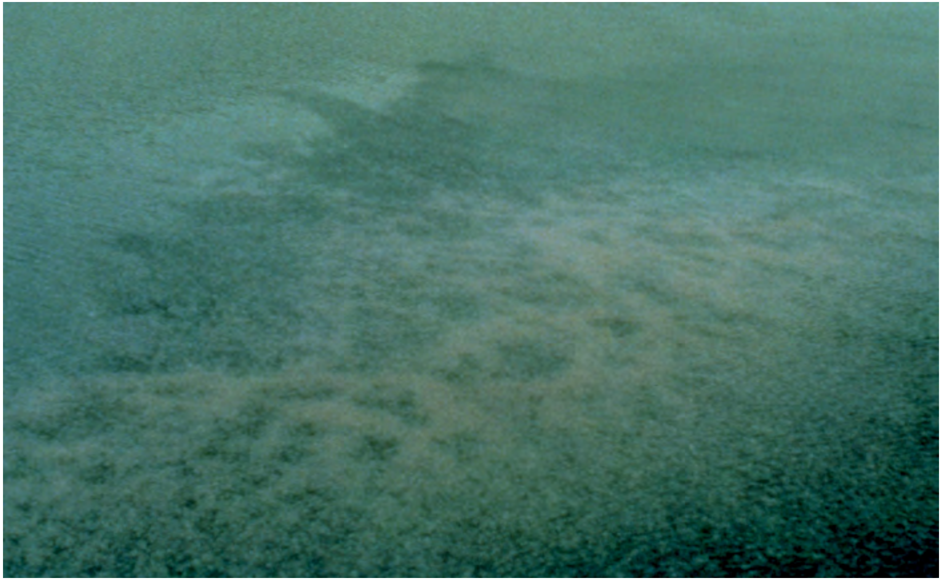
Kelp beds are frequently mistaken for oil. Sometimes kelp bulbs may be misidentified as tarballs.

Observation altitude:
800 ft. at very oblique angle

Platform:
Helo

JELLYFISH

Large accumulations of jellyfish (spring/summer) are frequently mistaken for oil. If in doubt, take a closer look.



Observation altitude:
50 ft.

Platform:
Helo

RED TIDE

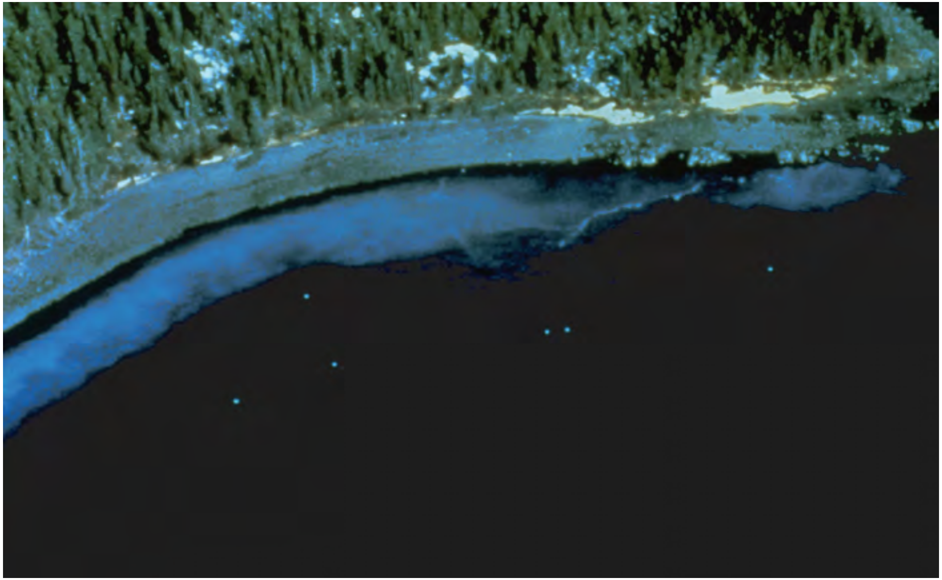
Red tide blooms are sometimes reported as oil.

Observation altitude:
1500 ft.

Platform:
Helo

HERRING SPAWN

Herring spawn along shoreline can easily be mistaken for silver sheen.

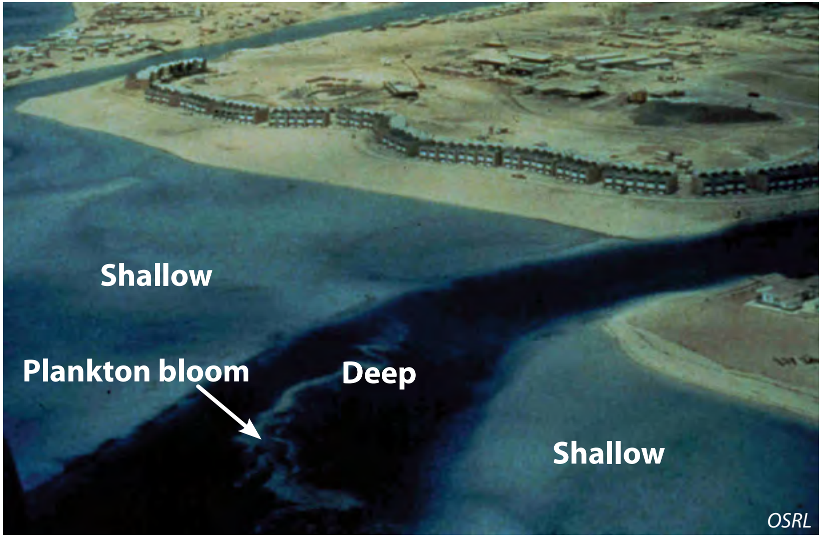


Observation altitude:
1200 ft.

Platform:
Helo

WATER DEPTH CHANGE

In clear water, changes in the depth of nearshore waters may present subtle and sometimes dramatic changes in appearance. Having a chart and knowing the topography of the survey area will help distinguish an oil slick from a shadow or water color change.



CLOUD SHADOWS

At times cloud shadows on water may have the appearance of oil. Inspect closely and check for sheens.

EFFECTIVE BOOMING AROUND DRY DOCK

Oil being contained within boom (without entrainment). This is possible with low currents until boom reaches holding capacity.

Observation altitude:
500 ft.

Platform:
Helo

Oil coverage:
n/a

ENTRAINMENT OF SILVER/GRAY (S) AND METALLIC (M)/DULL BROWN SHEEN

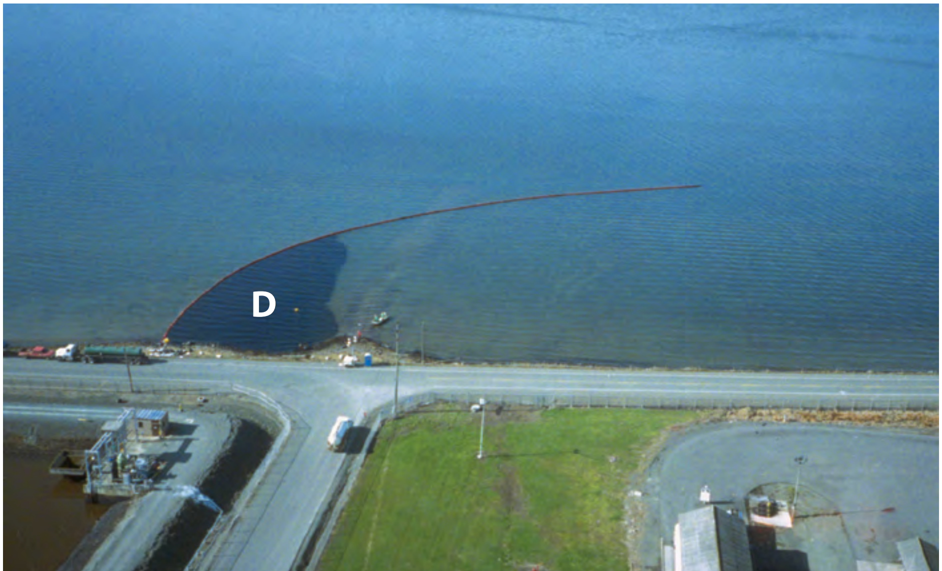
Entrainment of oil under boom deployed in high current.

Observation altitude:
500 ft.

Platform:
Helo

EFFECTIVE CONTAINMENT OF BLACK DARK (D) OIL

Black dark (D) oil contained between boom and shoreline under very calm wind and current conditions.



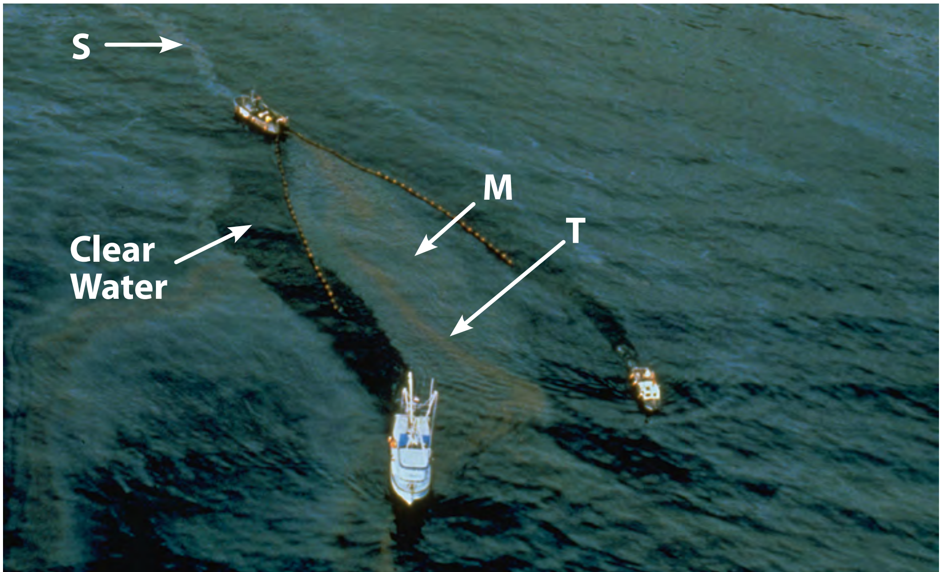
Observation altitude:
300 ft.

Platform:
Helo

Oil coverage:
n/a

ENHANCED SKIMMING

Boom towed in front funneling oil into skimmer. Note **transitional (T)** and **metallic (M)** oil in open boom and how thin **silver/gray (S)** sheen appears to pass through the skimming vessel.



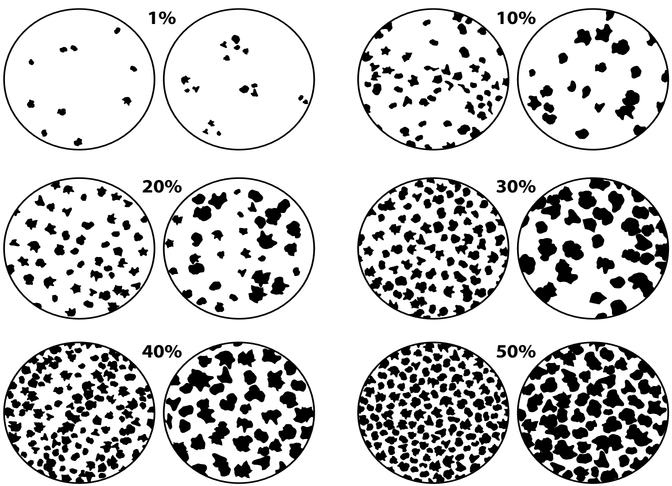
Observation altitude:
500 ft.

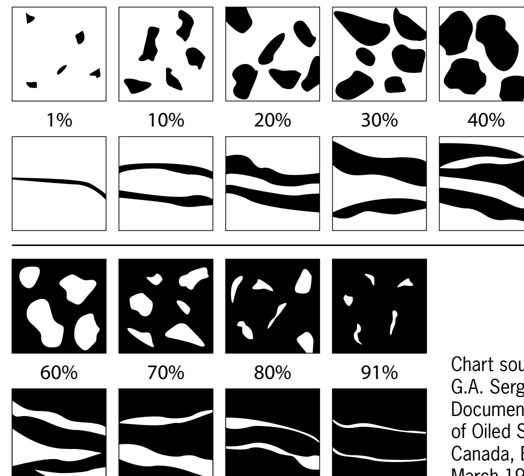
Platform:
Helo

Oil coverage:
n/a

PERCENT COVERAGE CHART

This chart is an aid to help you determine the percent of oil coverage in the area you are observing. When determining the coverage of an oil spill on the water, estimate the percentage of clean water and subtract from 100 to calculate the percentage of oil. Try to picture all the oil in one corner of the area you are observing and determine the clean water remaining.





Trace = < 1%

Chart source: Owens, E.H., and G.A. Sergy. Field Guide to the Documentation and Description of Oiled Shorelines. Environment Canada, Edmonton, Alberta, Canada. March 1994. ISBN 0-662-22048-X.

OIL SPILL OBSERVATION CHECKLIST

Record information on chart of area being observed.

General Information

___ Date

___ Time (start/end)

___ Case Name

___ Information filled out by (name/phone)

___ Observers' names

___ Observers' affiliations

___ Location of source (if known)

___ Percent coverage

___ Stage of tide (flood, ebb, slack)

___ On-scene weather (wind, sea state, visibility)

___ Platform (helo, fixed-wing, boat)

___ Flight path/trackline (from GPS)

___ Altitude observations were made from

___ Areas not observed
(fog, restricted air space, shallow water)

In planning flight path/trackline, plan the track so as not to take pictures looking into sun; get the best window seat; avoid midday light to minimize reflection; communicate with the pilot at all times, have access to GPS (lat/long), and go beyond impacted areas to ensure that there is not more oil beyond these areas.

OIL SPILL OBSERVATION CHECKLIST

Record information on chartlet of area being observed.

Oil Observations

___ Slick location(s)

___ Slick dimension(s)

___ Orientation of slick(s)

___ Distribution of oil (streamers (st), convergence zones (co), windrows (wr), patches (pa), tarballs (tb), no structure (ns))

___ Color and appearance (silver/gray (S), rainbow (R), metallic (M), transitional (T), dark (D), mousse (E))

___ Percent coverage (estimate of area with oil. See Percentage Coverage Chart.)

___ Is oil recoverable? (black and transitional oil, mousse, heavy metallic slicks from diesel or oil)

Clearly describe (draw on map or chart) where oil is observed, or if the oil slick consists of a number of smaller slicks, consider flying the perimeter of both the entire slick and the smaller slicks with a GPS in Track mode. Also identify where no oil is observed.

OIL SPILL OBSERVATION CHECKLIST

Record information on chartlet of area being observed.

Other Observations

Response Operations…

___ Skimmer deployment (General locations. Are skimmers in highest concentration of oil?)

___ Boom deployment (General locations. Does boom contain oil? Is oil entraining under boom?)

___ Source (Status of source. Is oil still being released?)

Environmental Observations…

___ Location of convergence lines, rip tides, sediment plumes, coastal currents, and river/tidal estuary discharges

___ Location of kelp beds, seagrass (anything which might trap oil or be mistaken for oil)

___ Wildlife present in area (give location and approximate numbers of birds and marine mammals)

DOCUMENTATION GOALS

Simplicity: Use standard terms. Use Data Logs and Field Report Forms. Limit the number of tasks assigned to each observer.

Brevity: Use codes and keyed annotations. Avoid photo-saturation and lengthy videos.

Neatness: Print neatly. Use a pencil with eraser. Key lengthy annotations/notes on seperate form.

Accuracy: Be mindful of limitations and end-use. Ensure that Date/Time are on for cameras and other data logging equipment. Time-link everything!

Scale: Include common objects in images. Maintain and record desired altitude. Shoot close to vertical and note "dip" angles. Sketch to scale.

Redundancy: Periodically photograph notes and GPS with time. Hand-record key digital/electronic data.

U.S. DEPARTMENT OF COMMERCE
Rebecca M. Blank, Acting Secretary

National Oceanic and Atmospheric Administration
Dr. Jane Lubchenco
Under Secretary of Commerce for Oceans and Atmosphere and
NOAA Administrator

National Ocean Service
David Kennedy, Assistant Administrator
for Ocean Services and Coastal Zone Management

July 2012