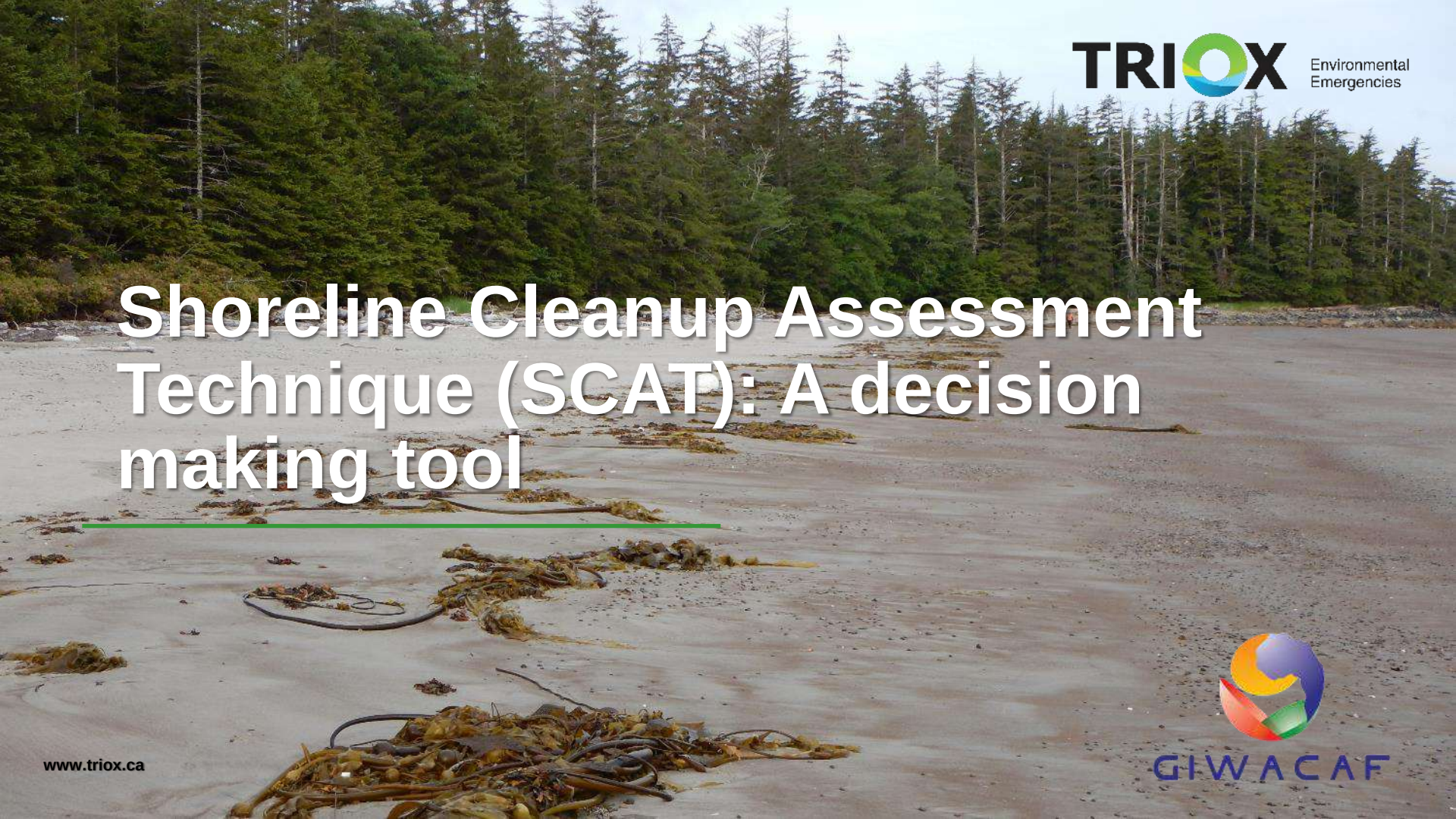


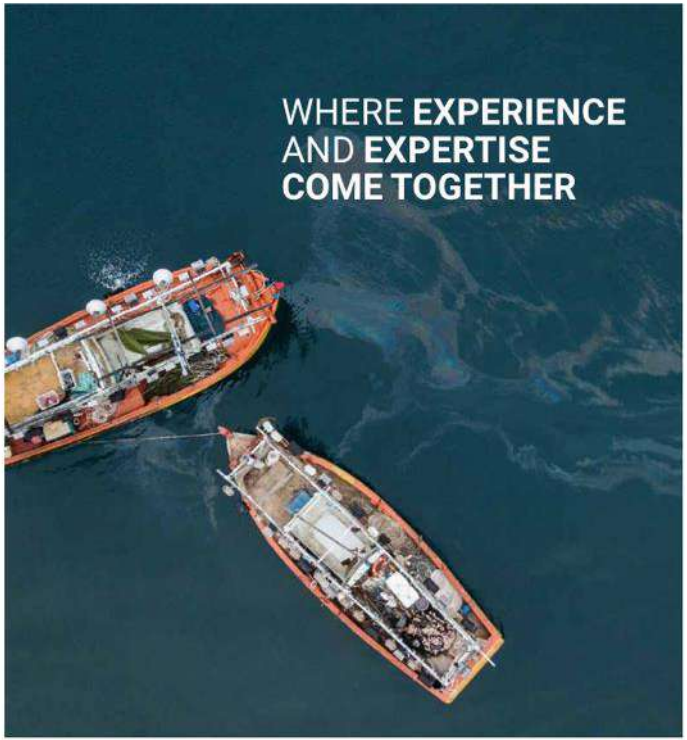
Shoreline Cleanup Assessment Technique (SCAT): A decision making tool

TRIOX Environmental Emergencies

www.triox.ca

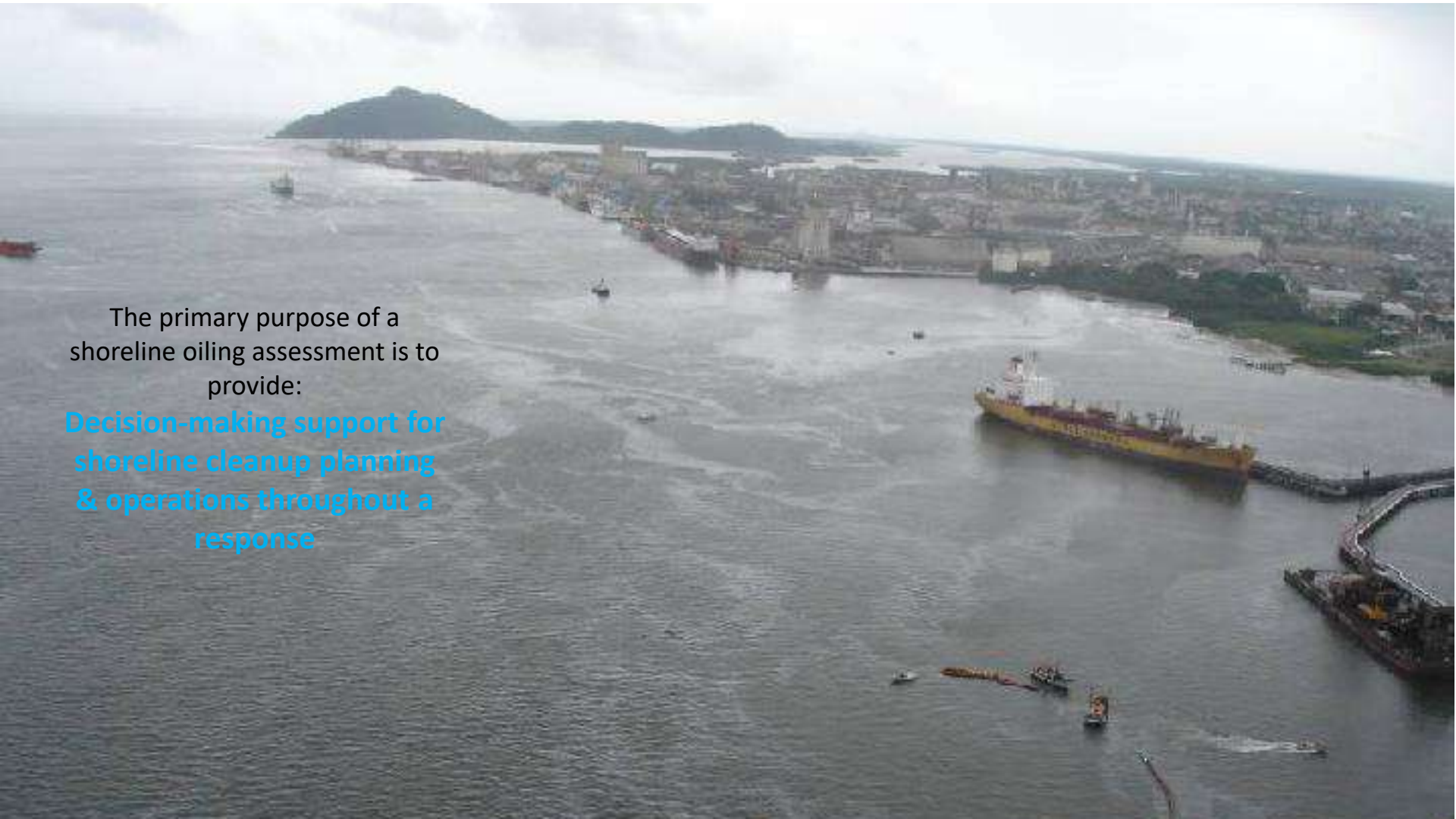
GIWACAF

Triox Environmental Emergencies



- Offers emergency preparedness, training and response services for oil and chemical spills.
- UK, Canada, Singapore

www.triox.ca



The primary purpose of a shoreline oiling assessment is to provide:

Decision-making support for shoreline cleanup planning & operations throughout a response

Why do we need SCAT?

How do we:

a. describe the shoreline?
b. describe the oiling?
c. describe where it is?
d. describe how much there is?
e. decide if we need to clean?
f. decide how to clean?
g. decide how much to clean?
h. decide how to end cleanup?

IPIECA

A guide to oiled shoreline assessment (SCAT) surveys

Good practice guidelines for incident management and emergency response personnel

NOAA

Shoreline Assessment Manual

4th Edition

DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Emergency Response Division

August 2013

Environment and Climate Change Canada | Environnement et Changement climatique Canada

SHORELINE CLEANUP ASSESSMENT TECHNIQUE (SCAT) MANUAL

THIRD EDITION

Canada

THE UK SCAT MANUAL

Shoreline Cleanup Assessment Technique

A Field Guide to the Documentation of Oiled Shorelines in the UK

adapted and reproduced from

Owens, E.H. and Sergy, G.A. 2004. The Arctic SCAT Manual: A Field Guide to the Documentation of Oiled Shorelines in Arctic Environments. Environment Canada, Edmonton, AB, Canada.

by
Jon Moore
Coastal Assessment, Liaison & Monitoring

for
UK Maritime & Coastguard Agency

April 2007

POSOW

Preparedness for Oil-polluted Shoreline cleanup and Oiled Wildlife interventions

OILED SHORELINE ASSESSMENT MANUAL

in partnership with

Shoreline assessment surveys are carried out to:

- Collect accurate data on shoreline type and oiling conditions
- Identify environmental, cultural and operational constraints for cleanup
- Identify shoreline cleanup techniques that provide a Net Environmental benefit
- Help develop shoreline cleanup criteria (‘endpoints’)
- Monitor progress

Key SCAT Principles

- A **systematic** survey of all shorelines in the affected area
- Division of shoreline into geographic **segments**
- Use of **standard terms and definitions** for documentation and data entry
- Provide **management and operational support** until all treatment activities and inspections completed
- An objective and trained team of **interagency** personnel represents responsible party, government agencies, land ownership, land use/management or other interests

Key information from SCAT

- Shoreline types
- Description of shoreline oiling
- Description of the environnement and land use

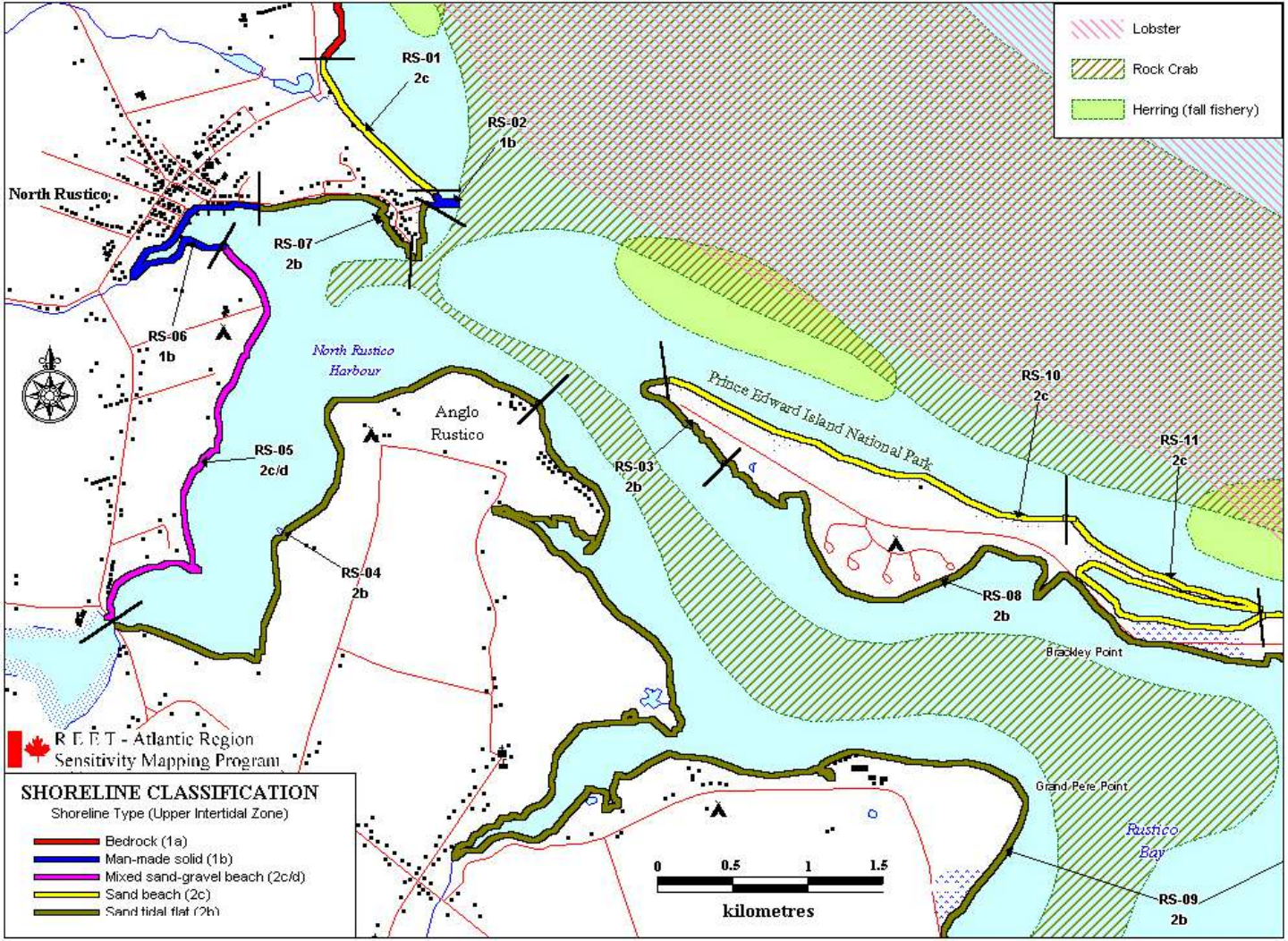
Shoreline Types

- Impermeable
  - Bedrock
  - Man-Made Impermeable

- Permeable
  - Man-made Permeable
  - Sand Beach
  - Mixed-Sediment Beach
  - Pebble-Cobble Beach
  - Boulder Beach
  - Mud Flat
  - Sand Flat
  - Mixed-Sediment Flat

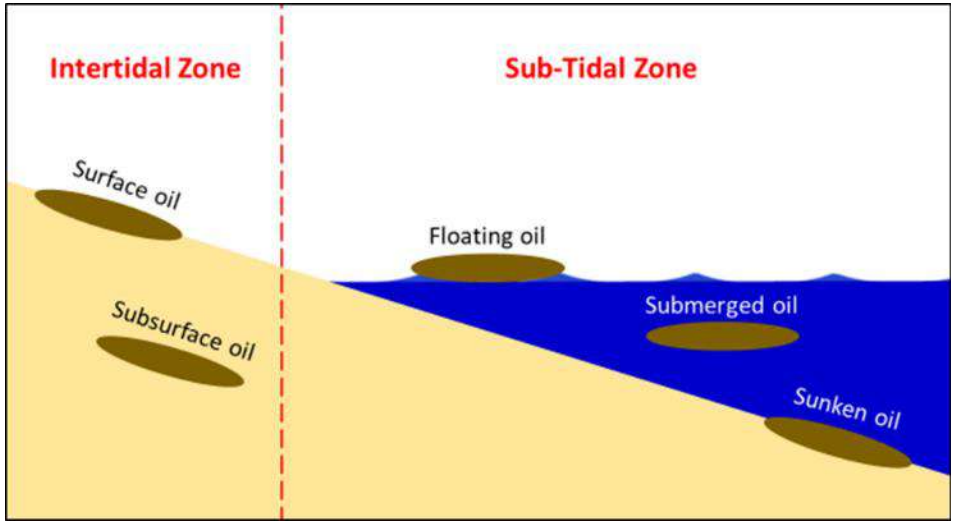
- Vegetated Shores
  - Wetlands/marsh
  - Salt Marshes (grasses)

Coastal Geomorphology and Biological Resources



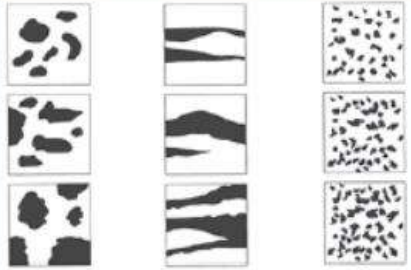
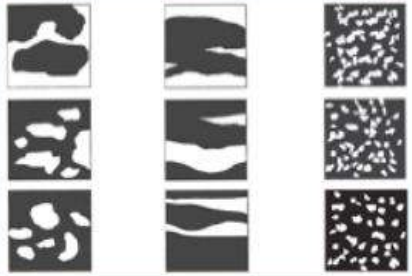
General Location of Oil

Oil Locations	
Surface	Oil on surface of the shoreline substrate
Subsurface	Oil in a beach that has penetrated the sediments or been buried by sediment movement due to wave or wind action
Floating	Oil floating at or near the water's surface
Submerged	Oil within the water column of near neutral buoyancy; may also be temporarily submerged due to entrainment by water turbulence so that the oil floats to the surface in calmer conditions
Sunken	Oil deposited on the ocean/lake bottom, typically negatively buoyant



SCAT surveys focus primarily on surface & subsurface oil that has stranded on the shoreline

Oil Distribution and Thickness

Category	Percentage Distribution	Schematic Examples
Sporadic	1–10%	
Patchy	11–50%	
Broken	51–90%	
Continuous	91–100%	

Surface oil thickness

Category		Thickness	Description
TO	Thick Oil	> 1 cm	Generally consists of fresh oil or mousse accumulations, or asphalt pavements
CV	Cover	> 0.1–1 cm	-
CT	Coat	> 0.01–0.1 cm	Can be scratched off easily with fingernail on coarse sediments or bedrock (“black paint”)
ST	Stain	≤ 0.01 cm	Cannot be scratched off easily with fingernail on coarse sediments or bedrock
FL	Film	-	Transparent or translucent film or sheen

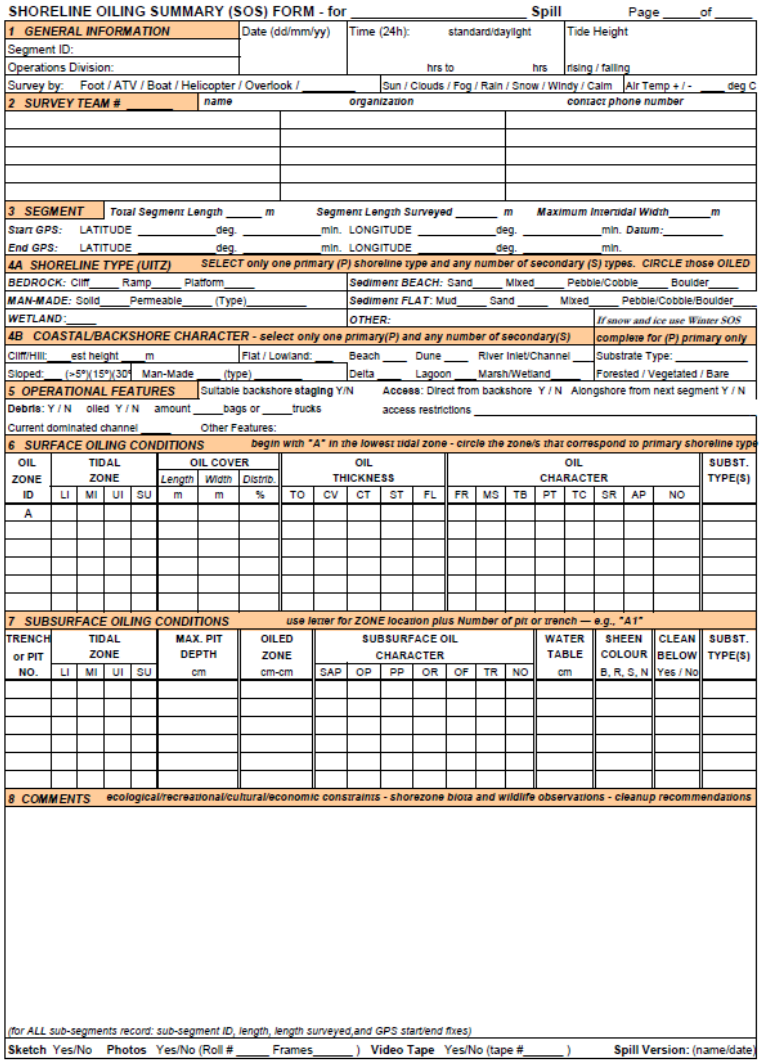
Oil Character (surface)

Oil Character		Description	E.g. Photos
FR	Fresh	Typically, un-weathered, low viscosity oil	
M S	Mousse	Emulsified oil (oil and water mixture) existing as patches or accumulations, or within interstitial spaces	
TB	Tar balls	Discrete oil balls on a beach or adhered to rock or coarse-sediment substrate. Tar ball diameters are generally <10 cm	

Oil Character (sub-surface)

Oil Character		Description	E.g. Photos
AP	Asphalt Pavement	Cohesive mixture of weathered oil and sediment situated completely below a surface sediment layer(s); photograph shows partially exposed subsurface asphalt	
OP	Oil-Filled Pores	Pore spaces in the sediment matrix are completely filled with oil; often characterized by oil flowing out of the sediment when disturbed	
PP	Partially-Filled Pores	Pore spaces are filled with oil, but generally does not flow out when exposed or disturbed	

SCAT forms



SHORELINE OILING SUMMARY (SOS) FORM - for _____ Spill Page _____ of _____

1 GENERAL INFORMATION	Date (dd/mm/yy)	Time (24h): standard/daylight	Tide Height
Segment ID:			
Operations Division:		hrs to hrs	rising / falling

Survey by: Foot / ATV / Boat / Helicopter / Overlook / _____ | Sun / Clouds / Fog / Rain / Snow / Windy / Calm | Air Temp + / - ____ deg C

2 SURVEY TEAM # _____ — name | organization | contact phone number

3 SEGMENT Total Segment Length _____ m | Segment Length Surveyed _____ m | Maximum Intertidal Width _____ m

Start GPS: LATITUDE _____ deg. _____ min. LONGITUDE _____ deg. _____ min. Datum: _____

End GPS: LATITUDE _____ deg. _____ min. LONGITUDE _____ deg. _____ min.

4A SHORELINE TYPE (UITZ) SELECT only one primary (P) shoreline type and any number of secondary (S) types. CIRCLE those OILED

BEDROCK: Cliff____ Ramp____ Platform____ | Sediment BEACH: Sand____ Mixed____ Pebble/Cobble____ Boulder____

MAN-MADE: Solid____ Permeable____ (Type)_____ | Sediment FLAT: Mud____ Sand____ Mixed____ Pebble/Cobble/Boulder____

WETLAND: ____ | OTHER: | If snow and ice use Winter SOS

4B COASTAL/BACKSHORE CHARACTER - select only one primary(P) and any number of secondary(S) complete for (P) primary only

Cliff/Hill: ____est height ____m | Flat / Lowland: ____ Beach ____ Dune ____ River Inlet/Channel ____ | Substrate Type: _____

Sloped: ____(>5°)(15°)(30° Man-Made ____(type) _____ | Delta ____ Lagoon ____ Marsh/Wetland ____ | Forested / Vegetated / Bare

5 OPERATIONAL FEATURES Suitable backshore staging Y/N | Access: Direct from backshore Y / N Alongshore from next segment Y / N

Debris: Y / N oiled Y / N amount ____bags or ____trucks | access restrictions _____

Current dominated channel ____ Other Features:

6 SURFACE OILING CONDITIONS begin with "A" in the lowest tidal zone - circle the zone/s that correspond to primary shoreline type

OIL ZONE	TIDAL ZONE				OIL COVER			OIL THICKNESS					OIL CHARACTER								SUBST. TYPE(S)
ID	LI	MI	UI	SU	Length m	Width m	Distrib. %	TO	CV	CT	ST	FL	FR	MS	TB	PT	TC	SR	AP	NO	
A																					

7 SUBSURFACE OILING CONDITIONS use letter for ZONE location plus Number of pit or trench — e.g., "A1"

TRENCH or PIT NO.	TIDAL ZONE				MAX. PIT DEPTH cm	OILED ZONE cm-cm	SUBSURFACE OIL CHARACTER							WATER TABLE cm	SHEEN COLOUR B, R, S, N	CLEAN BELOW Yes / No	SUBST. TYPE(S)
	LI	MI	UI	SU			SAP	OP	PP	OR	OF	TR	NO				

8 COMMENTS ecological/recreational/cultural/economic constraints - shorezone biota and wildlife observations - cleanup recommendations

(for ALL sub-segments record: sub-segment ID, length, length surveyed,and GPS start/end fixes)

Sketch Yes/No **Photos** Yes/No (Roll # _____ Frames_____) **Video Tape** Yes/No (tape #_____) **Spill Version:** (name/date)

The Phases of SCAT

SCAT Team

- Usually 2-3 members
  - One qualified SCAT lead
  - One government representative
  - One local representative (land owner/local authority/stakeholder)
- Equipment
  - GPS, Camera, notebook
  - Health and Safety
- Logistic
  - Transportation
    - Car
    - Boats
    - Helicopters

Initial Phase – Reconnaissance SCAT

- Aerial or boat-/ground-based observations
- Rapid data collection + turnaround
- Provides “big picture” – scales the problem

Second Phase – Ground SCAT

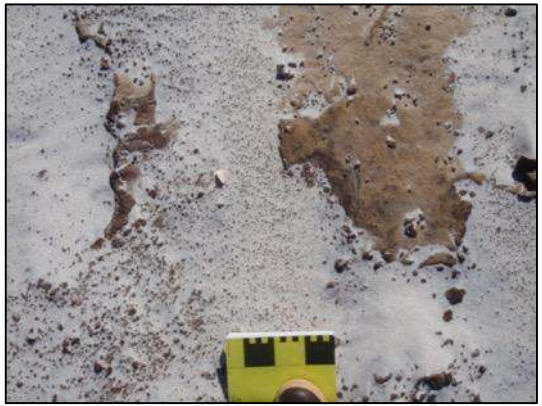
- Systematic ground surveys
  - Walk, boat, ATV
- Provide detailed information for operations
- Usually 3 to 5 teams
- Aerial surveys continue to provide “big picture”

Later SCAT Phases

- Post-treatment assessment to validate that segment meets endpoint
- Monitoring to track oiling conditions and weathering
- Completion inspections with representatives of key parties and stakeholders involved in response

Without SCAT….

- Effective response planning and prioritisation for a shoreline response program would not be possible
- Operations would have to make spontaneous, on-site decisions regarding treatment.
- Potential for under- or over-utilisation of resources
- Potential for negative environmental effects due to excessive treatment



Conclusion

- The SCAT method allows the systematic collection of information for shoreline cleanup.
- Facilitates the identification of appropriate clean-up methods according to the conditions of the spill by providing operational information.
- Allows the end of clean-up operations to be determined in a systematic manner.