



## Shoreline Assessments

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# Oiled Shorelines

- ▶ Often right in the public eye
- ▶ Potentially the most expensive part of a spill response
- ▶ Usually presents the greatest challenge in terms of management
- ▶ Can we be better prepared...?



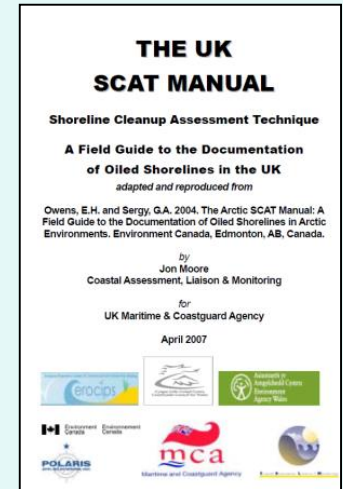
# In a spill response.....

- ▶ How do you describe the shoreline?
- ▶ How do you describe the oiling?
- ▶ Say where it is? How much there is?
- ▶ Decide if we need to clean?
- ▶ Decide how to clean?
- ▶ Decide how much to clean?
- ▶ Decide how to end cleanup?



# Shoreline Clean-up Assessment Technique

- ▶ **Systematic** surveys
- ▶ Shoreline **division** into segments
- ▶ **Standardised** terms and definitions
- ▶ Team of **inter-agency** personnel
- ▶ **Management** and **operational** support:
  - *Operational priorities*
  - *Treatment guidelines*
  - *End point criteria*
  - *Sign off process*



PREPAREDNESS

REACTIVE PHASE

SPILL RESPONSE PHASE

TERMINATION PHASE

Pre-Spill Data Collection



Shoreline segmentation  
Segment Characterization

Resource and sensitivity information  
Response tools and products

SCAT Pre-Spill Survey

Protect Shorelines –  
Recover Bulk Oil

Define extent and distribution of  
oiled shorelines

Collect and Assess  
Information and Data

Assemble environmental data on  
threatened resources

Define Response  
Objectives

Shoreline segmentation

OSA Form

Develop Response  
Procedures and Techniques

Segment characterization

Evaluate Response  
Feasibility

Segment oiling conditions

Develop Shoreline  
Treatment Plans

Define objectives, priorities,  
endpoints & constraints

Shoreline Treatment  
Recommendation (STR) Form

Treat Shorelines

Define treatment strategies,  
techniques and tactics

Shoreline Inspection Report  
(SIR) Form

Post Treatment Inspection

Individual segment plans linked to IAP

Treatment Completion

Post-incident assessment  
and evaluation

Termination / Monitoring



# What can be done pre-spill?

► Pre-spill SCAT data collection is intended to complete as many phases of the SCAT process as can be undertaken prior to a spill

► Recommended:

- Segmentation
- Pre-spill SCAT surveys

► Supporting data sources:

- e.g. ERMA in USA
- e.g. MAGIC in UK
- Shoreline Response Plans
- OSCP/OPEP

Pre-SCAT Field Training Segment Survey Form ver. PWS (page 1) TRAINING VERSION

(1) GENERAL INFORMATION (Please use full date e.g. 12/01/2014, 24 hour time e.g. 14:30 and decimal degrees - WGS84)

Area: Location: Segment ID: [ ]

Survey Date: Survey Time: to Segment Length (kilometre): [m]

Team: [ ] Participants: Tide Level: [m] [H- M- U] [R- F]

Participants: Survey Method: (Free / ATV / Boat / Aft / Other)

GPS Start (W/P): Lat: Long: End (W/P): Lat: Long:

(2) PHYSICAL CHARACTER\* (Shoreline (Substrate & Type) Backshore Character)

Physical Parameters	Shoreline (Substrate & Type)			Backshore Character		
	Lower	Upper	Supra	Description	Fringe	Inland
Height	m	m	m	Height	m	m
Width	m	m	m	Width	m	m
Slope	L/M/R	L/M/R	L/M/R	Slope	L/M/R	L/M/R
Bedrock	Platform / Ramp / Cliff			Platform / Ramp / Cliff		
Unconsolidated	Bank / Cliff / Trench / Scree			Bank / Cliff / Trench / Scree		
Beach	Mud			Beach		
	Sand			Dune		
	Mixed Fine (sil - shell) hash			Forest		
	Mixed Coarse (spc. k)			Grass / shrubs		
Flats (Sediments)	Coarse (spc. k)			Agriculture / fields		
	Boulder / rubble / Riprap			Tide Channel / foresh		
	Peat / Organics			Lagoon / River Channel		
Wetlands:	Marsh			Estuary / Wetlands / Delta		
Manned:	Permeable			Permeable		
	Impermeable			Impermeable		

\*Circle features and check boxes as appropriate. Indicate multiple features as P = Primary, S = Secondary, T = Tertiary, (V) = Veneer

(3) POTENTIAL OIL BEHAVIOUR (Circle as appropriate)

Direct Oil Oil Embankment: V / N Type: Wetlands: Tide Flat: V / N Type:

Oil emplace during winter months: V / N Type: Fresh Water Outlet or Segment: V / N Type:

Overwash Inlet(s) / Pool(s): V / N Type: Narrow Scouring Barrier: V / N Type:

Man-made Obstruction Barrier: V / N Type:

Light Accumulation Area / Open: V / N Type: Rapid Penetration: Low / Moderate / High

Substr. in Segment: V / N Type: Penetration Potential: Low / Moderate / High

Channel(s) / Mouth(s) / Open: V / N Type: Penetration Potential: Low / Moderate / High

Channel(s) / Mouth(s) / Open: V / N Type: Penetration Potential: Low / Moderate / High

(4) RESOURCE ISSUES: (Resource(s) at Risk) Response Constraints

Environmental: [ ]

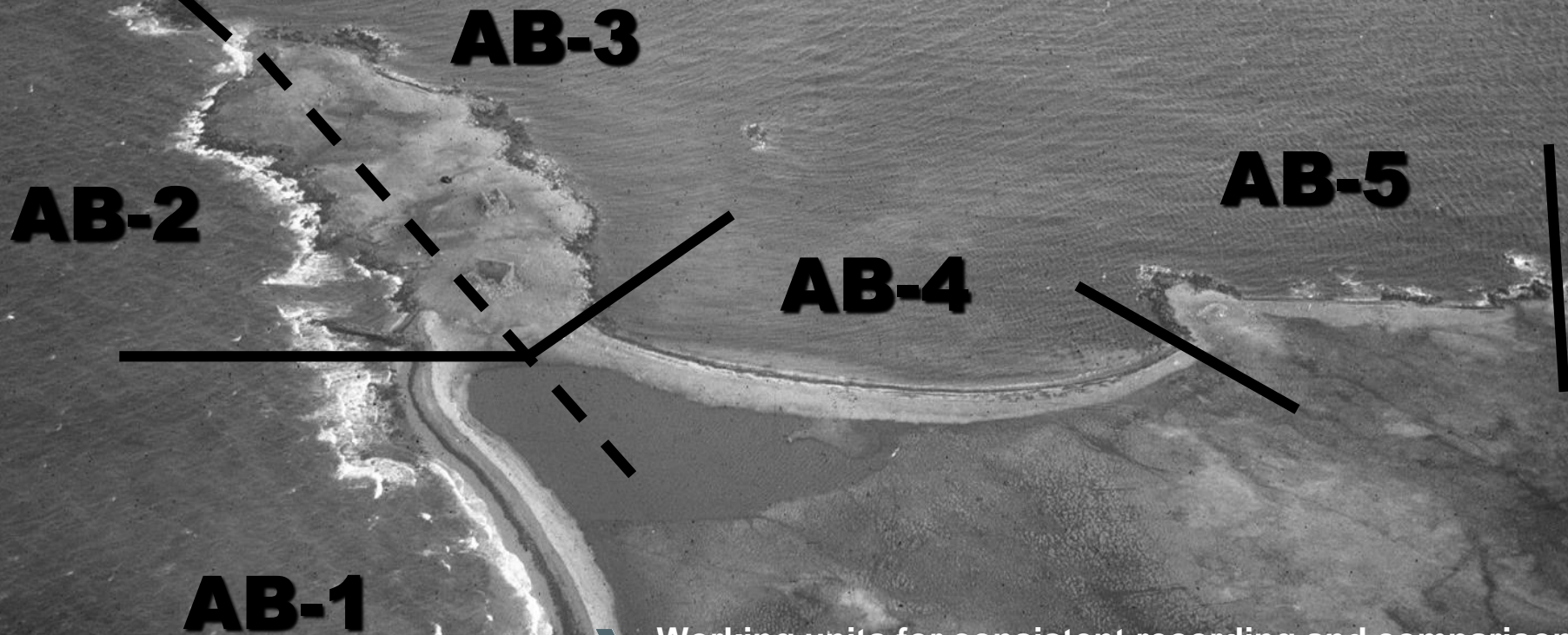
Cultural / Historical: [ ]

Human Use/Economic: [ ]

(5) MEDIA (SELECT: yes / no; PHOTOS/VIDEO: yes / no; TRACKLINE: yes / no; PHOTOGRAPHERS: [ ])



# Segmentation



- Working units for consistent recording and comparison through spill timeline
- Homogenous physical features or sediment type within each segment
- Assigned unique location code e.g. AB-1
- Boundaries – prominent geological features, changes in shoreline or substrate type, change in oiling conditions; operational area boundaries; either side of water inlets
- Typical range 0.2 to 2 km



GI-01  
(Shell beach)

GI-02  
(Seawolf Park)

GI-04  
(Riprap)

GI-03  
(Marsh)

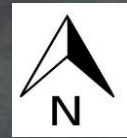
GI-05  
(Big Reef Nature Park)

GI-06

GI-07

500 m

# PHB Island – Sample Segmentation



PHB-4  
580m

PHB-3  
330m

30m

PHB-2

PHB-5  
250m

PHB-1  
380m

PHB-6  
360m

PHB-7  
80m

Jetty

# Pre-spill SCAT surveys

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- ▶ Ensures valuable information is available for building the spill response strategy on day 1
- ▶ Saves valuable time and resources – reduce field effort
- ▶ SCAT trained personnel with spill experience ideally
- ▶ Collects focussed operational and logistical data
- ▶ Stakeholders align on NEBA and chosen strategy / techniques
- ▶ Ideally hosted on a GIS platform

# Pre spill SCAT segment survey form

Pre-SCAT Field Training Segment Survey Form ver. PWS (page 1) **TRAINING VERSION**

**(1) GENERAL INFORMATION** *(Please use full date e.g. 12AUG2014 , 24 hour time e.g. 14:30 and decimal degrees – WGS84)*

Area: \_\_\_\_\_ Location: \_\_\_\_\_ Segment ID: \_\_\_\_\_

Survey Date: \_\_\_\_\_ Survey Time: \_\_\_\_\_ to \_\_\_\_\_ Segment Length (estimate): \_\_\_\_\_ (m)

Team ( ) - Participants: \_\_\_\_\_ Tide Level: \_\_\_\_\_ (m) (H - M - L) (R - F)

Participants: \_\_\_\_\_ Survey Method: (Foot/ATV / Boat / Air) Other: \_\_\_\_\_

GPS: Start (WP) \_\_\_\_\_ Lat: \_\_\_\_\_ Long: \_\_\_\_\_ End (WP) \_\_\_\_\_ Lat: \_\_\_\_\_ Long: \_\_\_\_\_

**(2a) PHYSICAL CHARACTER\* Shoreline (Substrate & Type)**

Description	Lower			Upper			Supra		
	Height	Width	Slope	Height	Width	Slope	Height	Width	Slope
Physical Parameters		m		m	m		m	m	
			L/M/H	L/M/H	L/M/H		L/M/H	L/M/H	
Bedrock	Platform / Ramp / Cliff						Platform / Ramp / Cliff		
Unconsolidated	Bank / Cliff / Talus / Scree						Bank / Cliff / Talus / Scree		
Beach Flats (Sediments)	Mud						Beach		
	Sand						Dune		
	Mixed Fine (sp) – shell hash						Forest		
	Mixed Coarse (sp-c)						Grass / shrubs		
	Coarse (pc-b)						Agricultural Fields		
	Boulder / Rubble / Riprap						Tidal Channel / Inlet		
	Peat / Organics						Lagoon / River Channel		
Wetlands	Marsh						Estuary / Wetlands / Delta		
Manmade	Permeable:						Permeable:		
	Impermeable:						Impermeable:		

*\*Circle features and check boxes as appropriate - Indicate multiple features as P = Primary, S = Secondary, T = Tertiary, (V) = Veneer*

**(2b) TIDAL INLETS, RIVERS, STREAMS, BARRIERS, AND LAGOONS in Segment** *(circle as appropriate)*

Inlet:	Open (stable)	Open (migrating)	Variably open/closed	Streams:	Continuous	Seasonal	Ephemeral
Channels:	Single Channel			Multiple Channel			
Character:	Simple	Overlapping		Straight	Braided	Meander	
Width (metres):	< 5	5 - 10	10-50	50-100	100 - 250	250 - 1000	>1000 m
Barrier Category:	Stable	Vegetated		Overwashed		Breached	
Lagoon Category:	Open			Closed			

**(3) POTENTIAL OIL BEHAVIOUR** *(circle as appropriate)*

Natural Bay or Embayment:	Y / N	Wetlands – Tidal Flat:	Y / N	Type:
Ice onshore during winter months:	Y / N	Fresh Water Outlet in Segment:	Y / N	Type:
Overwash Evident / Possible:	Y / N	Natural Alongshore Barrier:	Y / N	Type:
Natural Collection Site:	Y / N	Man-Made Alongshore Barrier:	Y / N	Type:
Log Accumulation upper / supra:	Y / N	Burial Potential	Low / Moderate / High	
Debris in Segment:	Y / N	Penetration Potential	Low / Moderate / High	
Abundant / Moderate / Sparse - Kelp / Fucus / Ulva / Eelgrass		Remobilization Potential	Low / Moderate / High	

**(4) RESOURCE ISSUES:**

	Resource(s) at Risk	Response Constraints
Environmental		
Cultural / Historical		
Human Use/Economic		

**(5) VISUALS**

SKETCH: yes / no; PHOTOS/VIDEO: yes / no; TRACKLINE: yes / no; PHOTOGRAPHER(S): \_\_\_\_\_

Pre-SCAT Field Training Segment Survey Form (page 2)

**(6) PROPERTY REFERENCE INFORMATION** *(circle)* Segment: \_\_\_\_\_ Date: \_\_\_\_\_

Property Jurisdiction (if known): Federal / State / Municipal / Private / Corporate / other \_\_\_\_\_

Property Type: Natural / Agricultural / Commercial / Industrial / Residential / Recreational / Park

Property Owner: \_\_\_\_\_ Contact #: \_\_\_\_\_

**(7) ACCESS** *(circle as appropriate)*

Remote Area:	Y / N	Strong Currents:	Y / N
Exposed Coast:	Y / N	High Tidal Range (>3m)	Y / N
Backshore Cliff or Manmade impediment:	Y / N	Alongshore Access within segment:	Y / N
Narrow intertidal zone:	Y / N	Alongshore Access to adjacent segment:	
Nearshore shoals / reefs / kelp:	Y / N	Looking onshore - Left / Right / Both / No	
Wetlands/Mudflats:	Y / N		

Other Access Constraints / Considerations: \_\_\_\_\_

**LAND ACCESS** YES / NO *(circle)* *If access is available on this segment, check as appropriate*

To / From:	Foot	ATV	4WD P/U	Light Equipment	Heavy Equipment
Staging Area/Backshore					
Intertidal					

Existing road / trail access available for the level of equipment indicated above? YES / NO

Road Type *(circle as appropriate)* Foot Path / Single Vehicle Lane / 2-Lane / Paved / Un-Paved / Other->

**WATER ACCESS** YES / NO *(circle)* *If access is available on this segment, check as appropriate*

To / From:	Skiff	Shallow Draft (landing barge)	Deep Draft
Staging Area / Backshore			
Intertidal			

Infrastructure (Circle): Boat Ramp: WP \_\_\_\_\_ / Dock / Wharf: WP \_\_\_\_\_ / Industrial Intertidal Complex: WP \_\_\_\_\_

**AIR ACCESS (Helicopter)** YES / NO *(circle)* *If access is available on this segment, check as appropriate*

RESTRICTED:	SHORT-TERM:	SHUT DOWN:
Hot drop/pickup possible if required	Safe landing areas with tidal constraints	Long term staging area

**(8) STAGING** YES / NO *(circle)* *If staging is available on this segment or nearby, check as appropriate*

	Bags	Super Sacks	Light Equipment	Heavy Equipment	Operations Base
This Segment					
Nearby Segment					

Dry land storage facility available: YES / NO Type: \_\_\_\_\_

Describe the amount of pre-impact debris pickup/relocation work? ( light / moderate / heavy ) BAGS / TRUCKS

**(9) SAFETY CONSIDERATIONS** *Note specific safety concerns, issues and constraints for access and operations.*

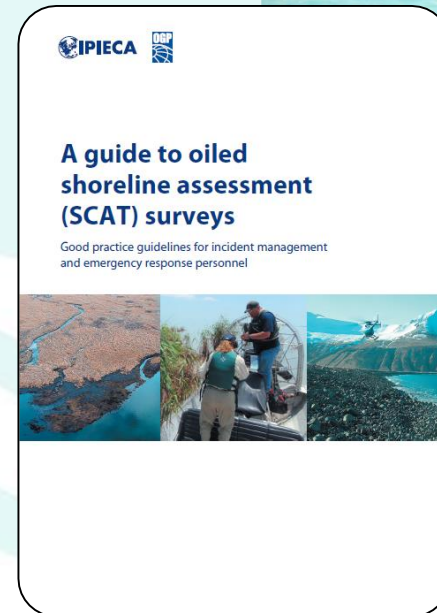
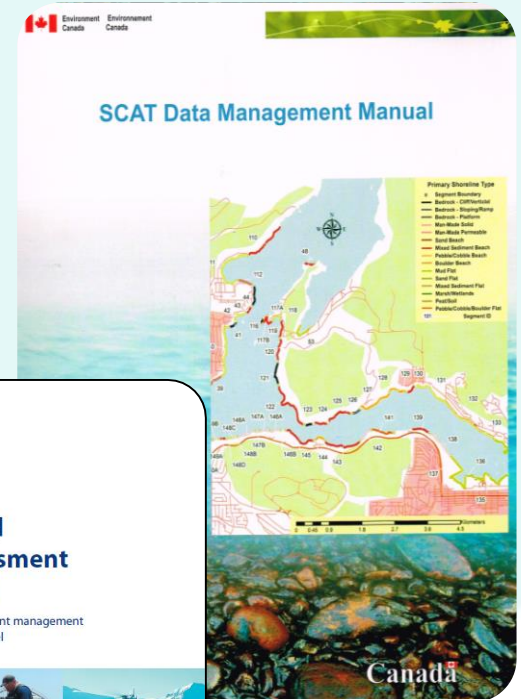
\_\_\_\_\_

**(10) ADDITIONAL COMMENTS** Weather: (Sun – Overcast – Rain – Snow – Fog – Windy – Calm)

\_\_\_\_\_

# Pre-spill SCAT database/GIS

- General Information
- Physical shoreline character
- Resource issues
- Operational characteristics
- Safety considerations
- Response goals
- Methods.....



# What issues could arise without SCAT....?

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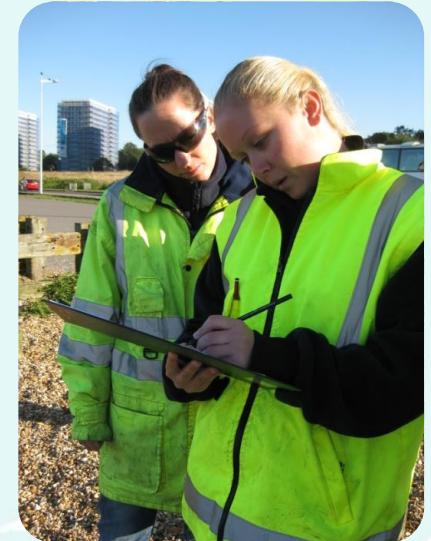
- ▶ Effective response planning and prioritisation for a shoreline response program would not be possible
- ▶ Operations would have to make spontaneous, on-site decisions regarding treatment.
- ▶ Potential for under- or over-utilisation of resources
- ▶ Potential for negative environmental impacts due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



# Thank you

Download for free

FIELD GUIDE:  
Shoreline Clean-up Assessment  
Technique (SCAT)



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