

## Near-shore oil spill response techniques

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## Near-shore oil spill response

- Part One
  - Oil-sensitive resources can be protected from the effects of spilled oil by the use of booms
- Part Two
  - The spilled oil contained by the boom may also be collected and recovered using skimmers or vacuum devices

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## Part One Inshore booming

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## Booms

- Booms are barriers that prevent oil from contacting oil-sensitive resources and containing oil prior to recovery
- Booms are produced in several types:
  - Offshore
  - Inshore skirt
  - Shore-sealing
- Booms are produced in standard lengths
  - Typically 10 metres or 20 metres

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## Inshore Protection Who does What

- MCA – Resources, expertise, provides contractors
- EA – Equipment, expertise
- Local Authority – logistics, assistance, 'manpower?'
- Oil spill contractors – Equipment, expertise, manpower

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## Boom deployment

- Technically complex
- Requires great expertise and manpower levels – mostly underestimated
- Significant H&S implications
- In major spills – insufficient resources
- Site prioritisation essential
- Think about oil recovery and temporary storage

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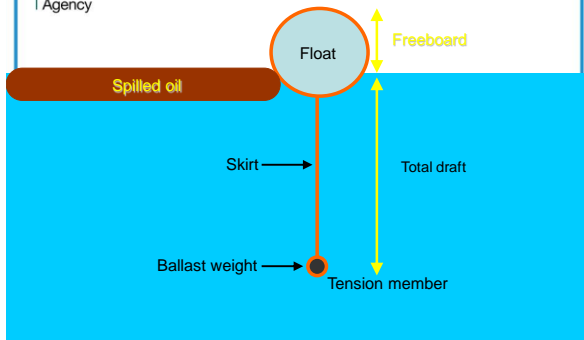
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## A typical skirted boom



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## Skirted boom



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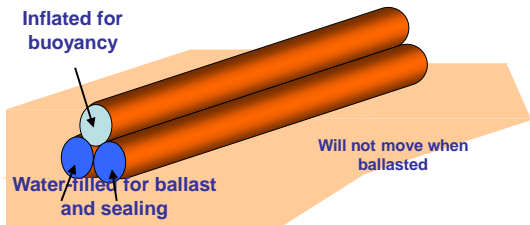
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## Shore-sealing boom

Useful for inter-tidal areas



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## Shore-sealing boom



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## Ancillary equipment

- MCA boom housed in 10 foot containers with all ancillaries required for deployment
- Deployment can fail on account of a missing shackle
- Ancillaries must be fit for purpose
  - Anchors, towing bridles, shackles, rope, chain, buoys, tirlor, blowers, water pumps, fixing screws, measuring rope or range finder

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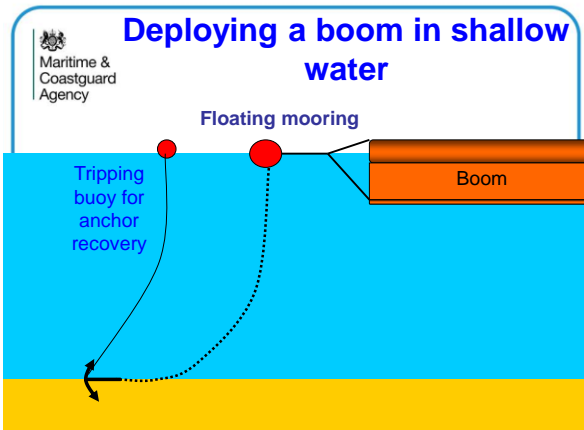
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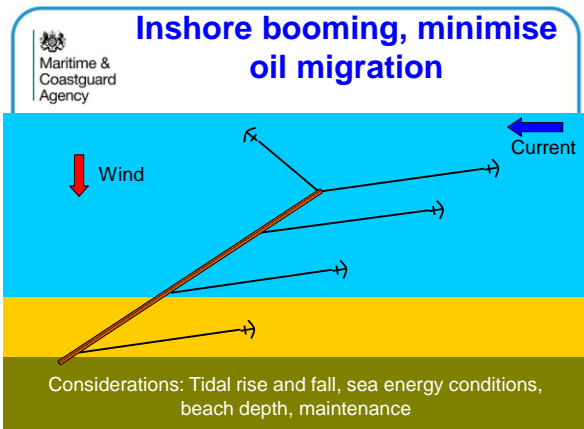
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**Boom Failures**

Maritime & Coastguard Agency

- Oil loss due to excessive water flow
  - When water flow exceeds 0.75 – 1.0 knots, perpendicular to boom, oil loss is inevitable
- Boom tensile failure
- Drainage failure
  - Boom collection point is “full up”
- Splash-over failure
  - Waves take oil over boom

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Maritime & Coastguard Agency

## Oil loss due to excessive water flow

Spilled oil

Oil becomes entrained in water flow around the bottom of the skirt

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Current in Knots	Boom to Bank Angle	Length of Boom in relation to River Width
0.7	90°	1.0 times river width
1.0	45°	1.4 times river width
1.5	30°	2.0 times river width
2.0	20°	3.0 times river width
2.5	16°	3.5 times river width
3.0	15°	4.3 times river width
3.5	11°	5.0 times river width
4.0	10°	5.7 times river width
5.0	8°	7.0 times river width

### Effect Of Current On Boom Angle

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Maritime & Coastguard Agency

## Spur Boom Formation

Access for oil recovery

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## Excessive Flow



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## Weather Limitations



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## Difficult Terrain



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## Soft Mud



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## Formal plan for each validation



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## Part Two

## Inshore Recovery

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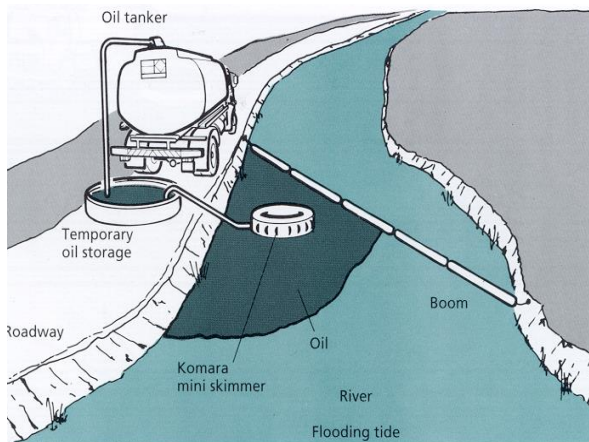
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**Recovering oil from the water surface**

- **Skimmers**
  - Weir
  - Oleophilic
  - Vacuum
  - Mechanical



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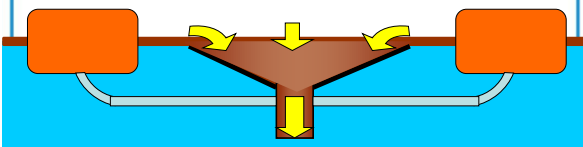
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**Weir Skimmer**



Lip of weir is adjusted to be at water surface so that oil flows into skimmer and is pumped away

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## Weir skimmer – requires calm conditions, good for viscous oils



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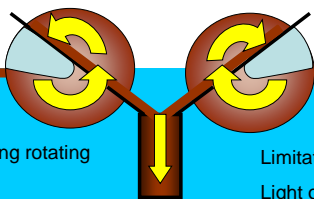
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## Oleophilic disc skimmer



Oil attracting rotating discs  
Scraped into weir  
Pumped to temporary storage

Limitations:  
Light oils only  
Encounter rate  
Energy conditions

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## Disc skimmer



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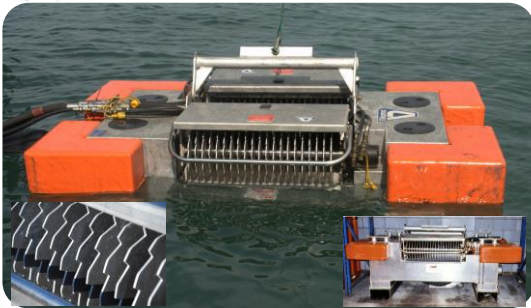
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## Heavy oil skimmer



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## Vacuum equipment

- Suction head and Vacuum tanks
- Limitations:
  - Encounter rate – thickness / distance from power pack
  - Oil viscosity
  - Vacuum head

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## Tractor vac units – highest capacity if encounter rate favourable



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## Vaculite tanks – lightweight – can access where trucks cannot



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## Maximise oil recovery, minimise water uptake



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## Temporary storage tanks or lined pits



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