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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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A typical skirted boom

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Skirted boom

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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, tirfor, blowers, water pumps, fixing screws, measuring rope or range finder

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Deploying a boom in shallow water

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Inshore booming, minimise oil migration

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Considerations: Tidal rise and fall, sea energy conditions, beach depth, maintenance

Boom Failures

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- 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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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

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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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Recovering oil from the water surface

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

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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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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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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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