Oil Spill Flow~Diverter™

CSC Advanced Marine Center

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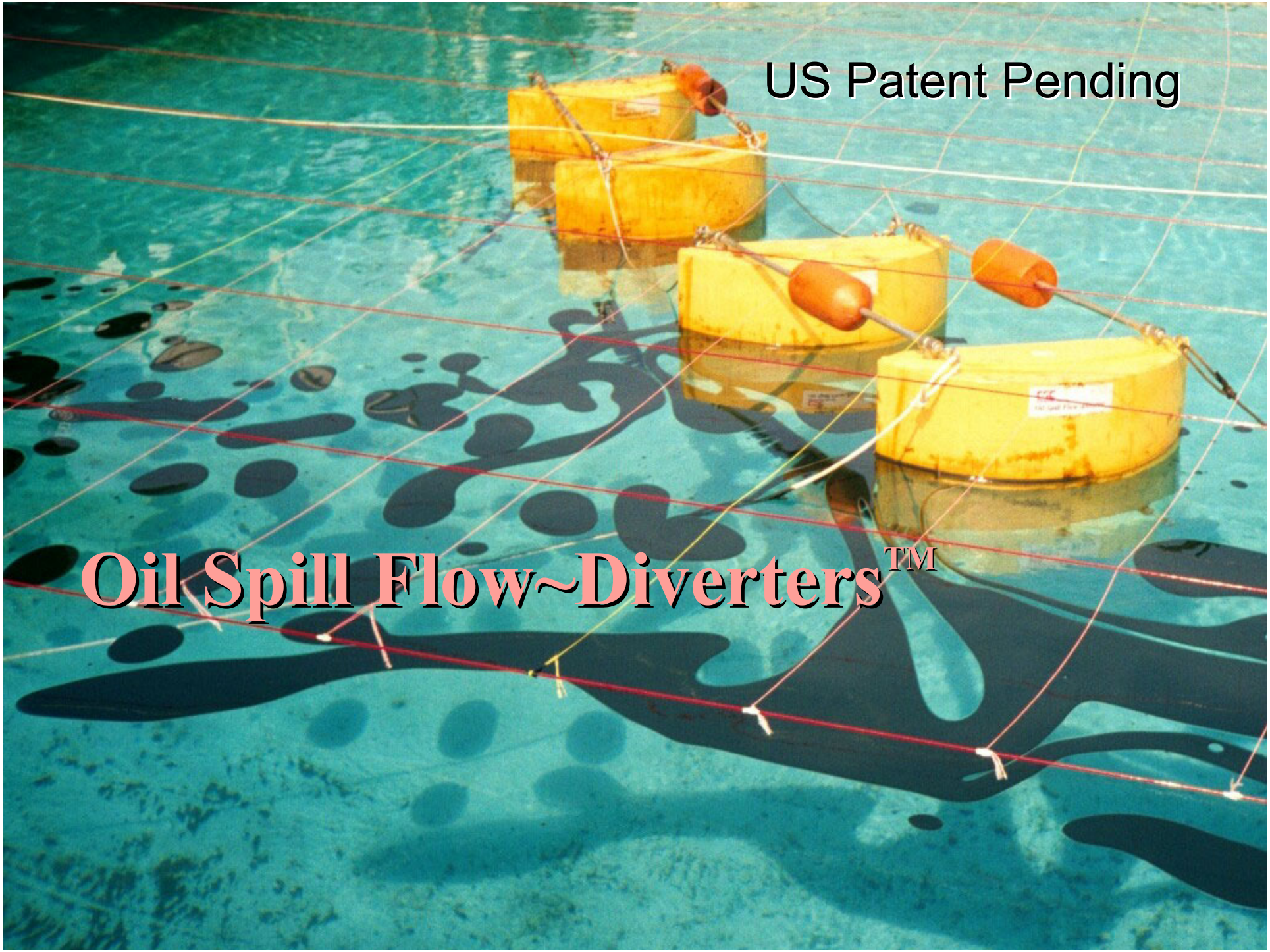
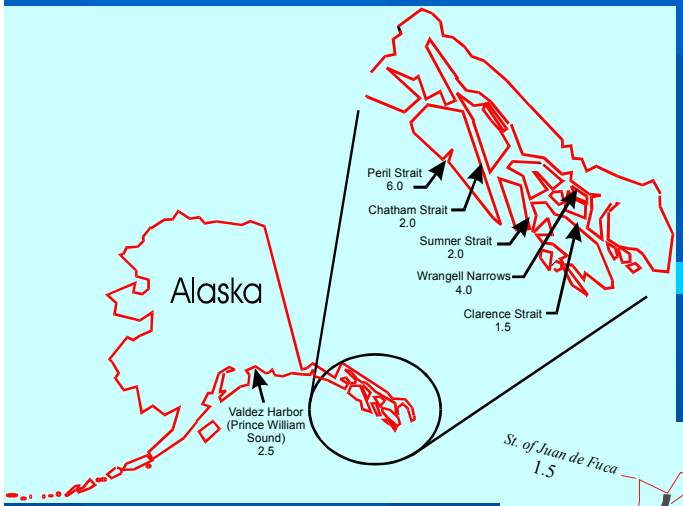
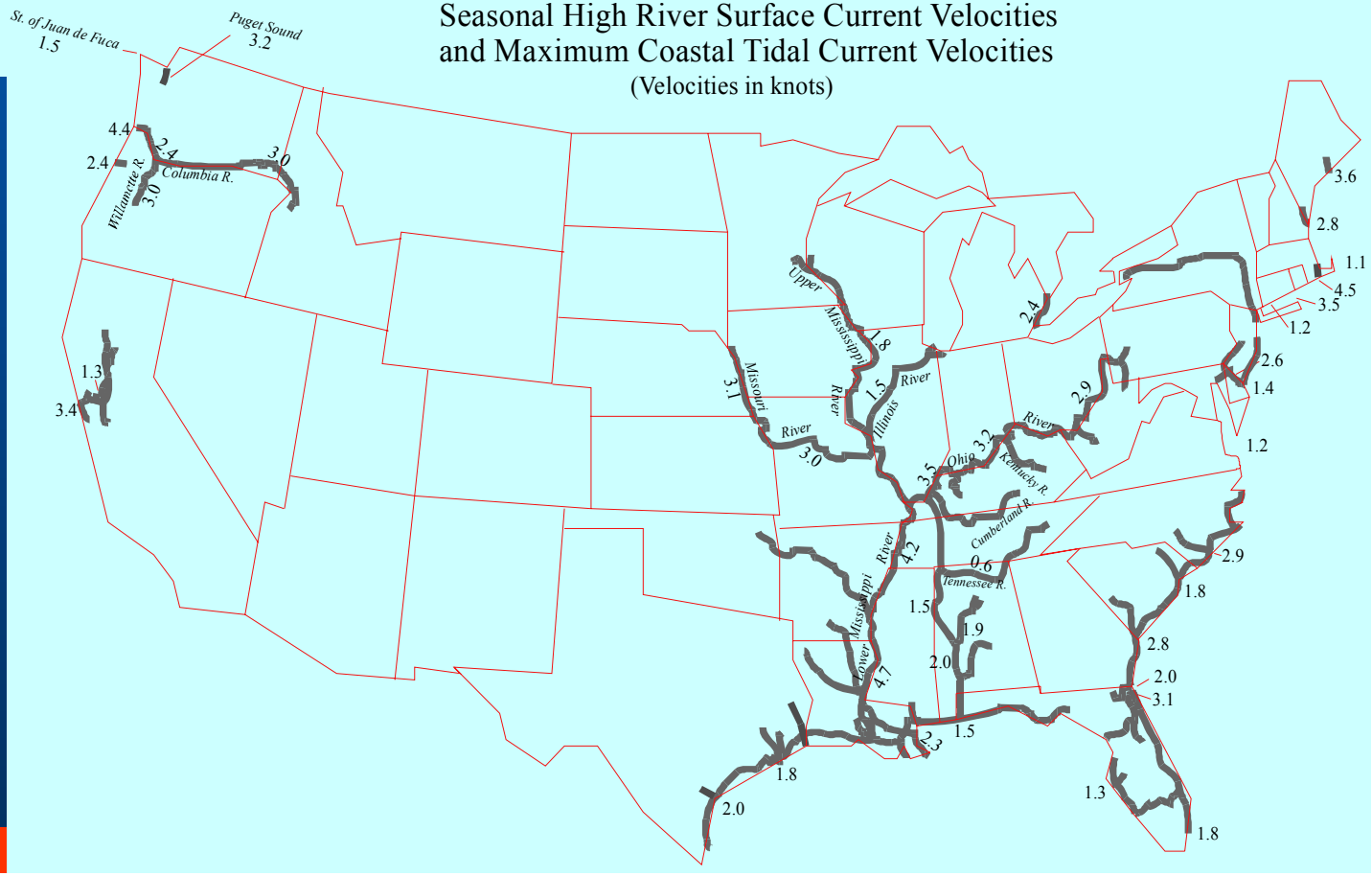


- 59% of all oil spilled in the US occurs in fast currents.
- Oil entrains under conventional boom and skimmers in currents above one knot.
- Advanced deflection boom techniques and skimmers are not very effective above 2 knots and are slow to deploy.

Fast-Water Currents



Seasonal High River Surface Current Velocities
and Maximum Coastal Tidal Current Velocities
(Velocities in knots)



Ba

- A Fast-Water Oil Spill study sponsored by the Coast Guard identified a short fall of available technologies to effectively respond to spills in currents above one knot
- Oil Spill Flow~Diverters were developed by CSC Advanced Marine under a US Coast Guard R&D Center contract initiated to improve fast-water response technology

Pr

- Develop method to control oil in fast-water conditions (1-7 knots) where booms fail
- Divert oil away from sensitive areas
- Divert oil to collection equipment/areas
- Deployable by two people from shore or from a boat
- Transportable by pickup truck or boat

De

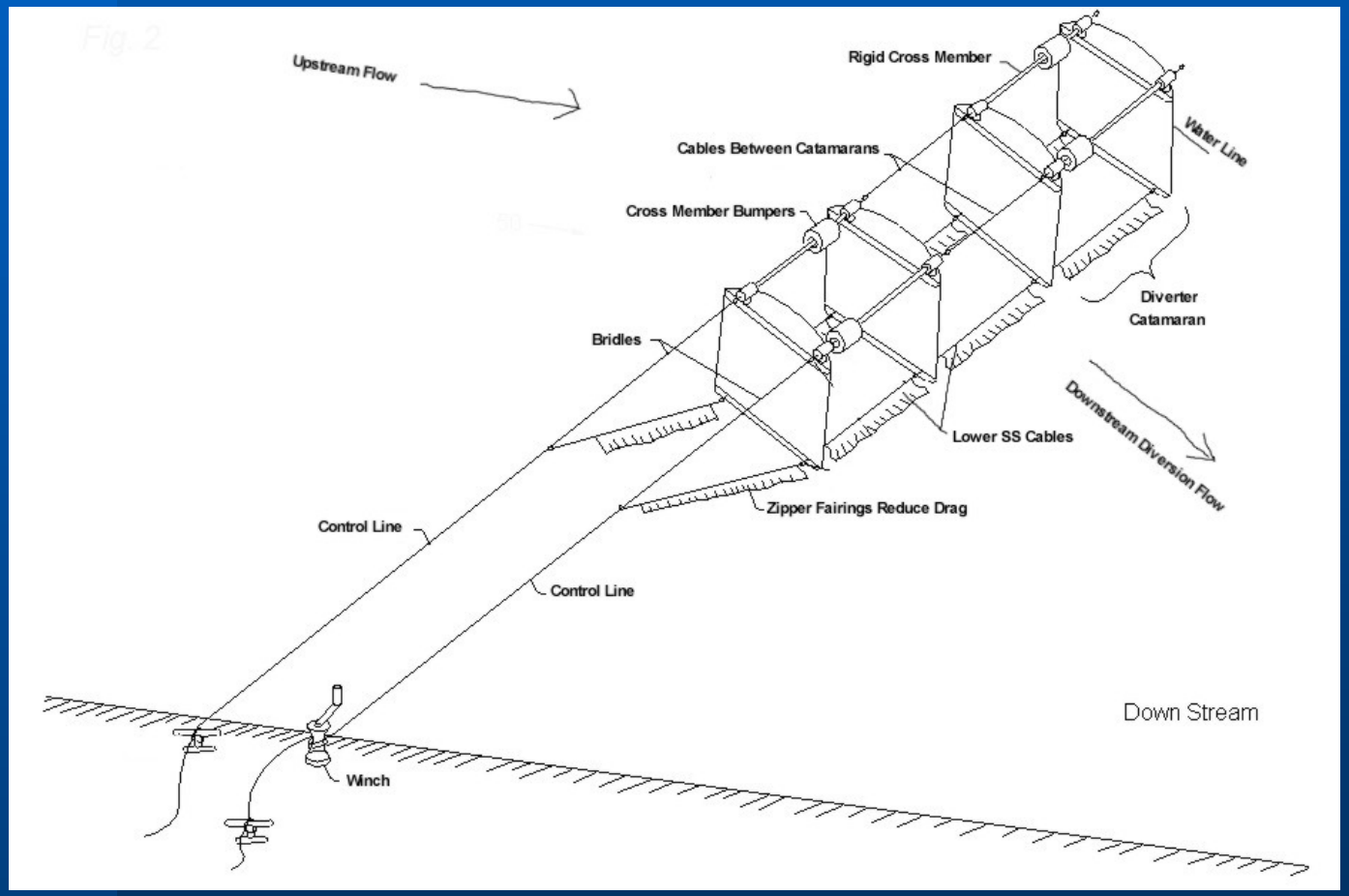
- Vertical foils are used to fly out into the current from shore or from a boat with the use of control lines.
- The foils divert the surface current and move the oil with it.
- The catamaran design adds stability and makes deployment easier.

- Fool the oil by changing the surface current direction in your favor.
- Control the oil spill flow in fast currents 1-7 knots where booms fail.
- Diverters are easily transportable and quick to deploy with only two people and no support boats.
- They can quickly move out of the way of debris or passing ships with control by one person.

De

- Successfully tested at US Navy NSWCCD Bethesda Circulating Water Channel in 1-7 Knots (May 2000)
- Demonstrated on Mississippi River in June from shore and from a vessel using simulated oil (1- 6 kts)
- Successfully tested at a Government tow tank (OHMSETT) at NWS Earle, NJ in Oil at 1 to 5 knots. Diverted and concentrated the oil slick 15+ feet from inboard diverter wing using two diverter catamarans. (June 2000)

Cata

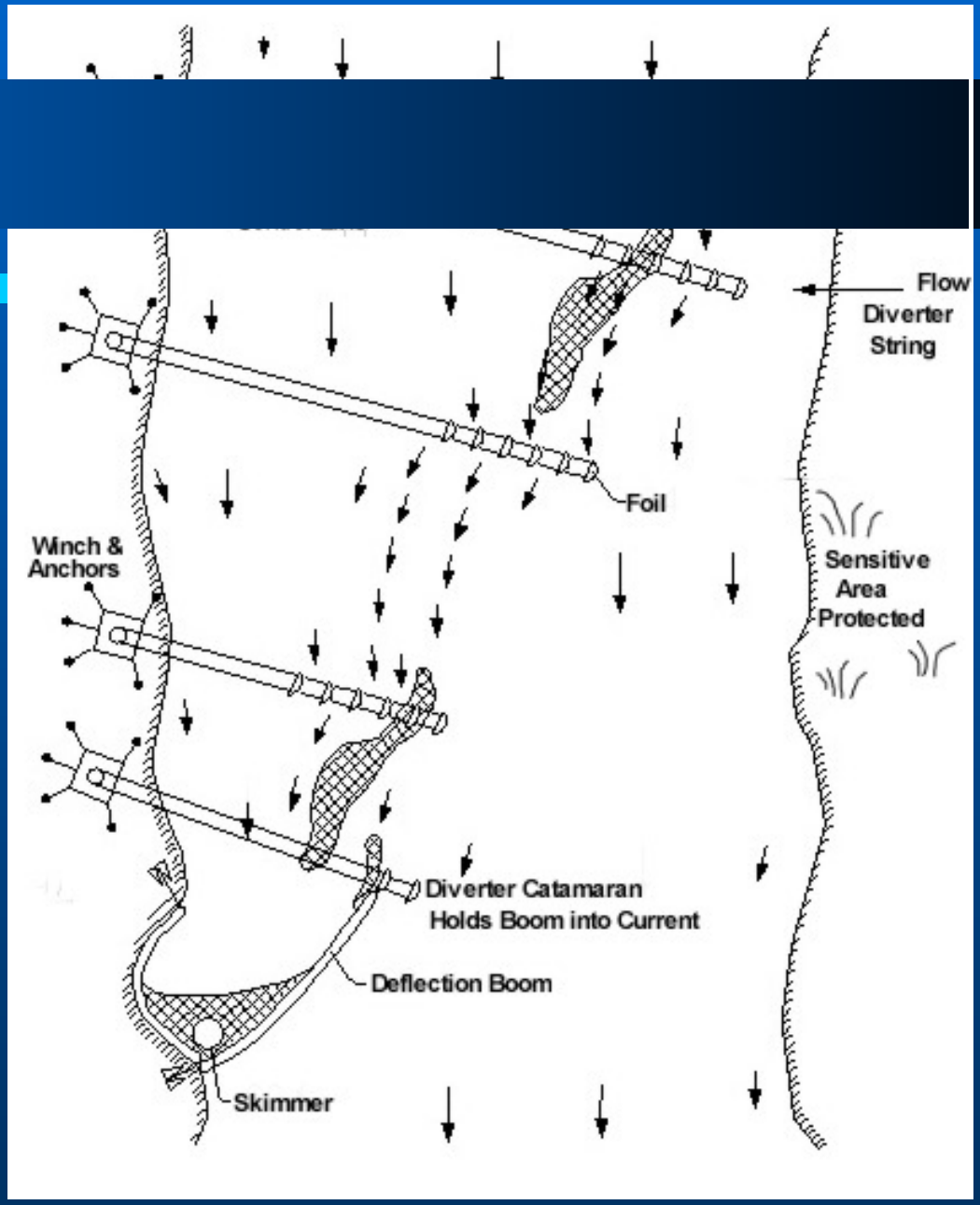


One Concept of Operations

- Cascade oil using an multiple arrays of Oil Spill Flow~Diverters.

- Divert oil from a sensitive area or to shore where the current slows down and conventional boom can be used for recovery.

- Deploy Deflection Boom



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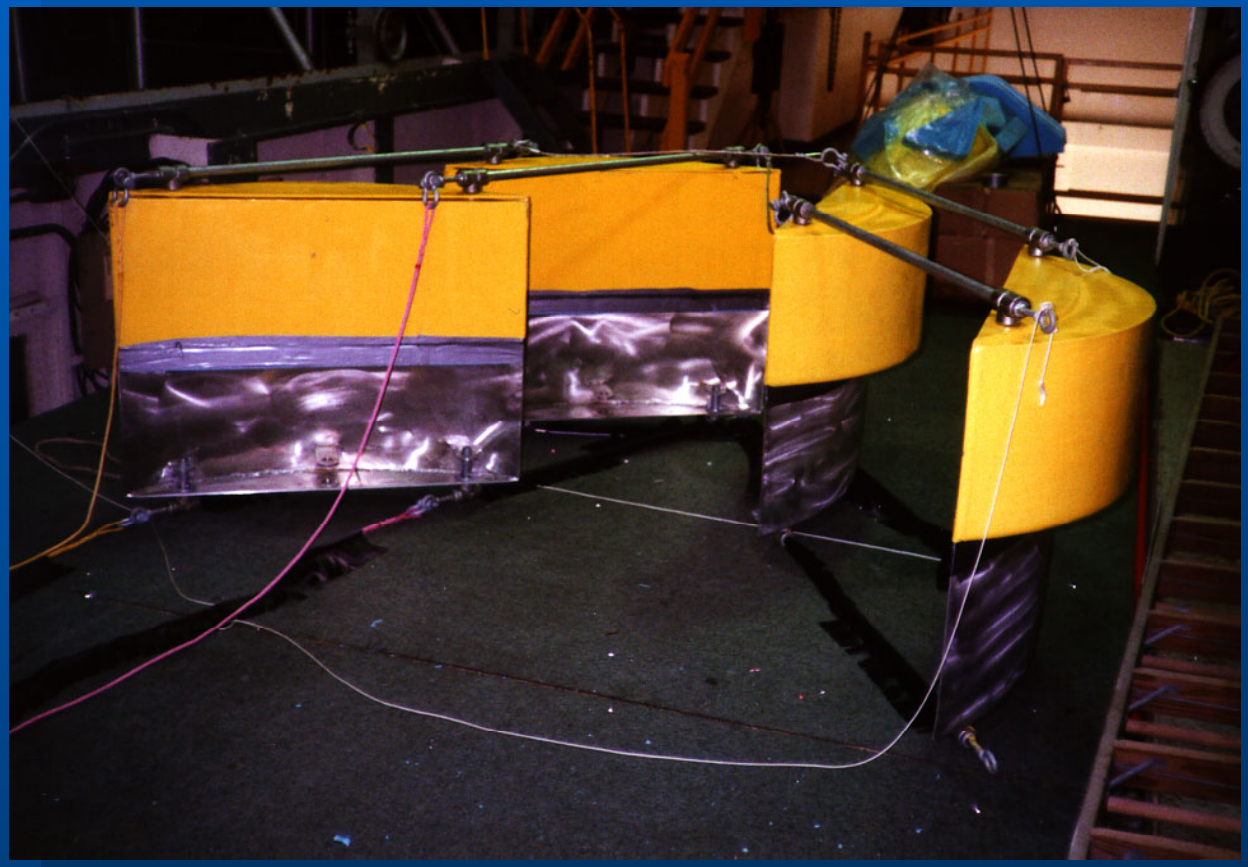

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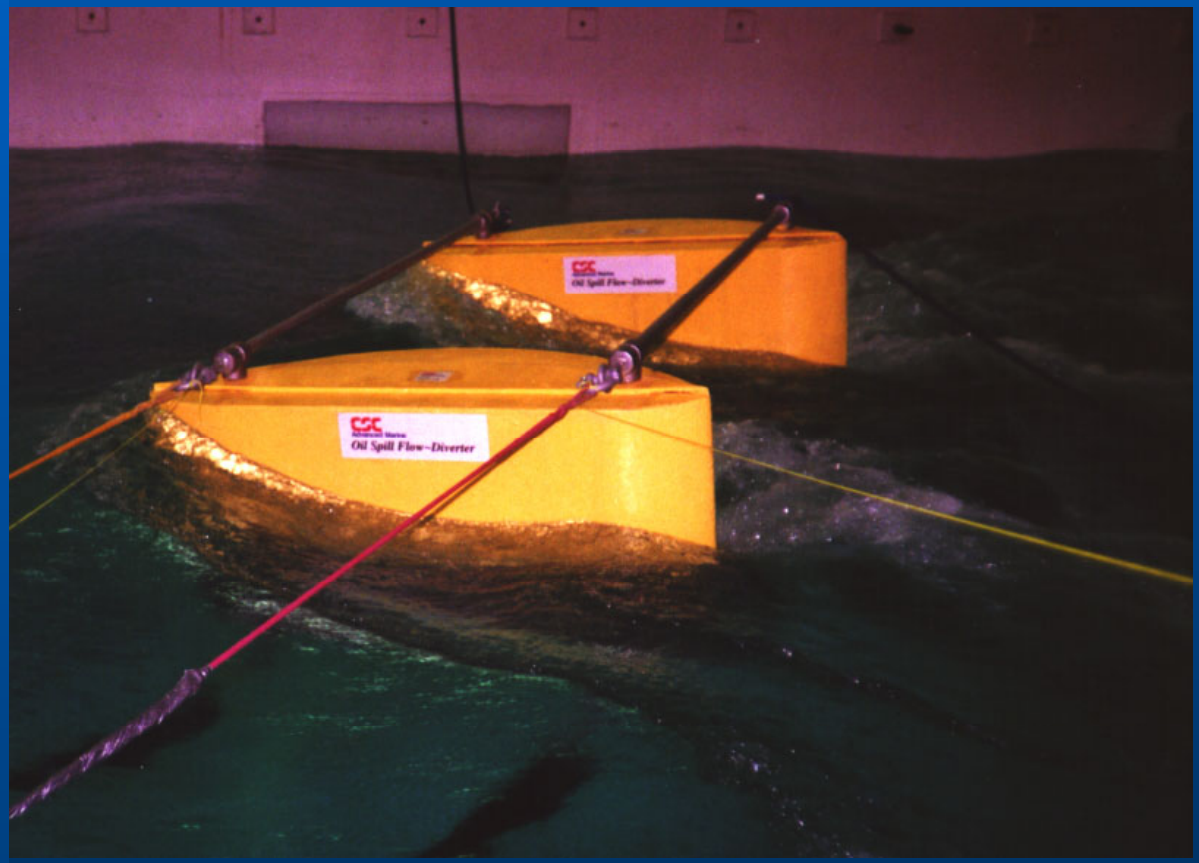
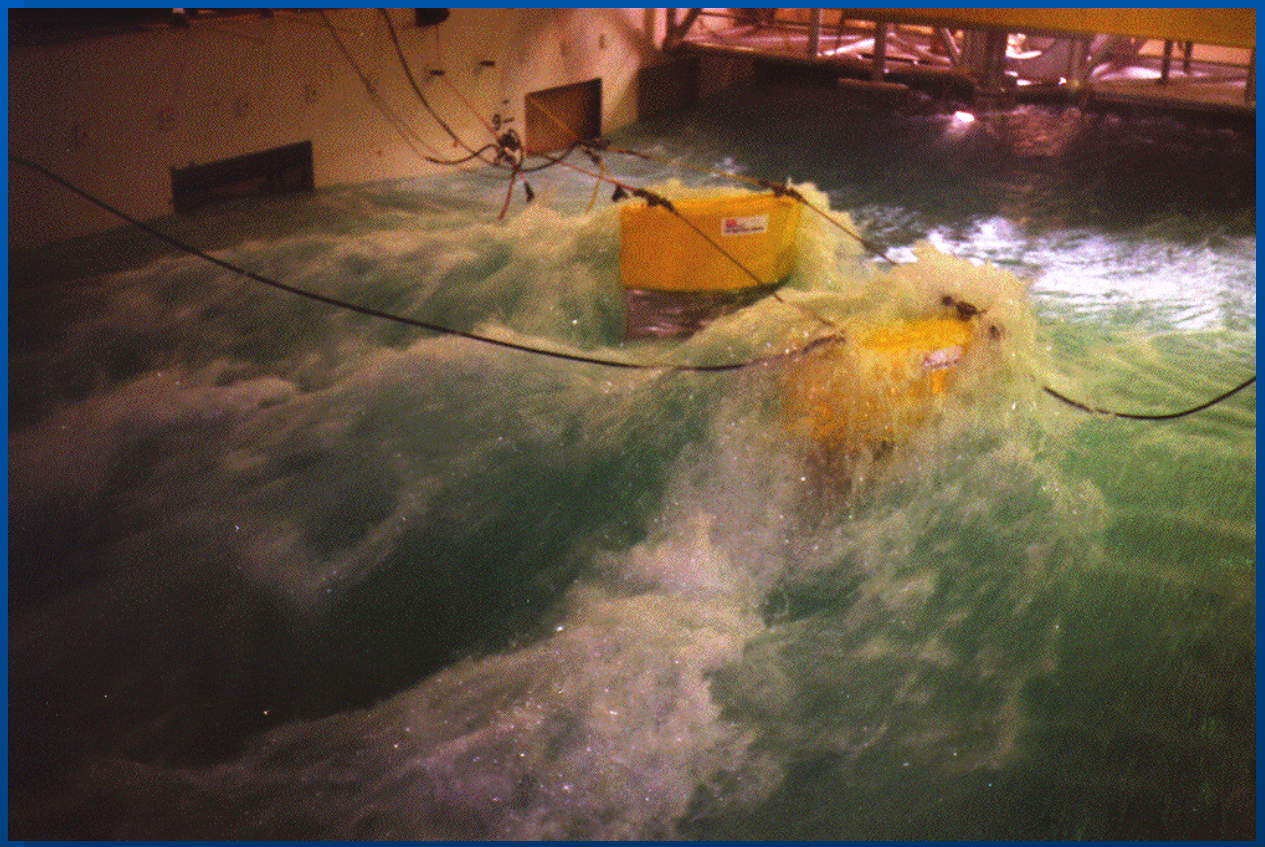


(

(cables only proved too hard to handle)



Fi

Deployed from a moored barge, 1.5 knots

Simulated Oil - Diversion Testing

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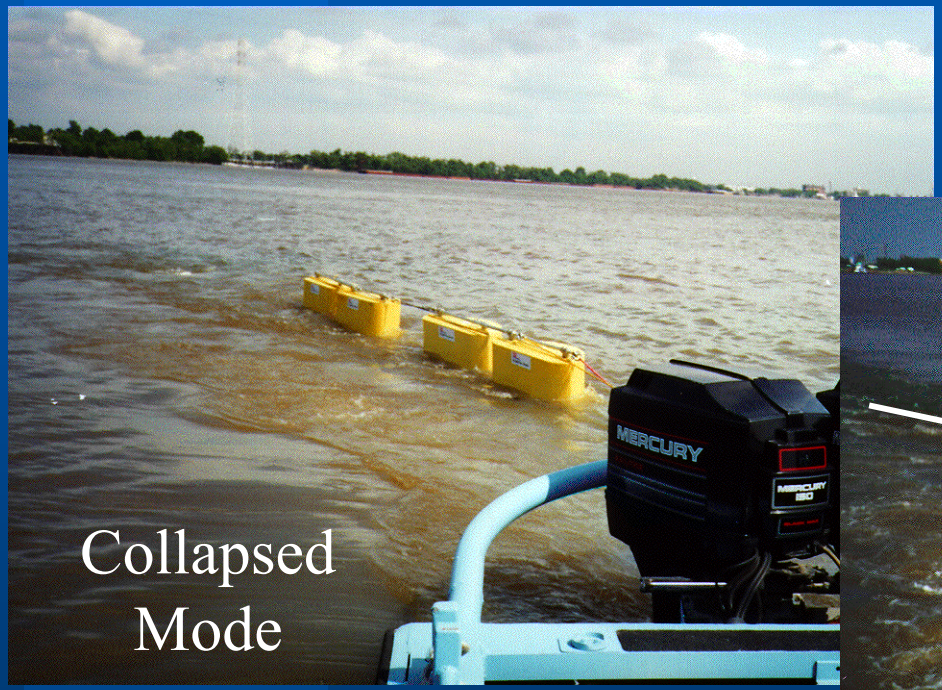

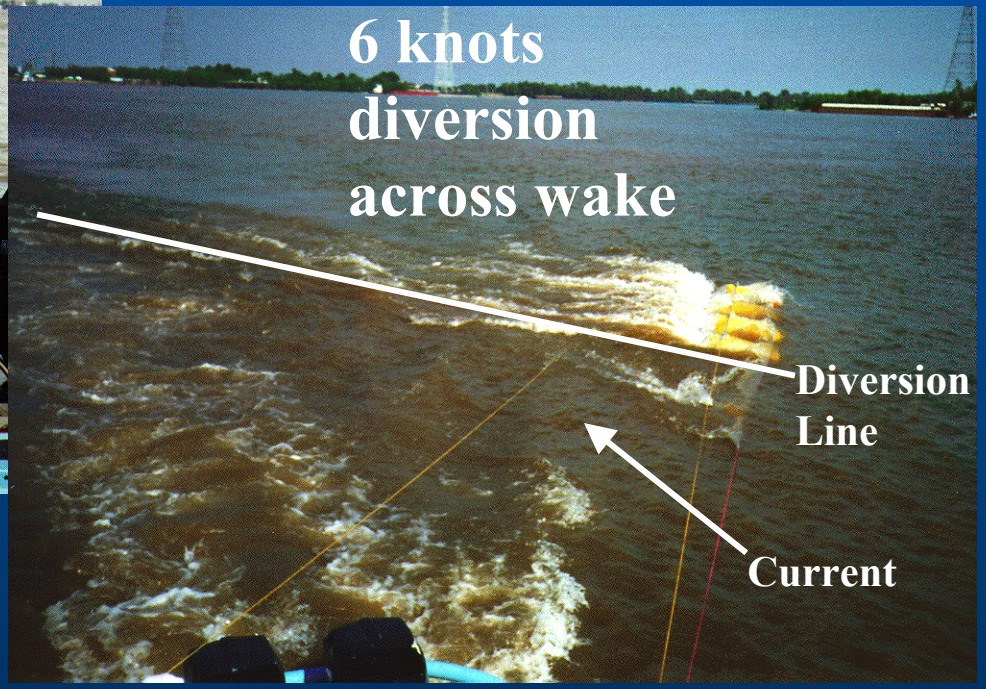

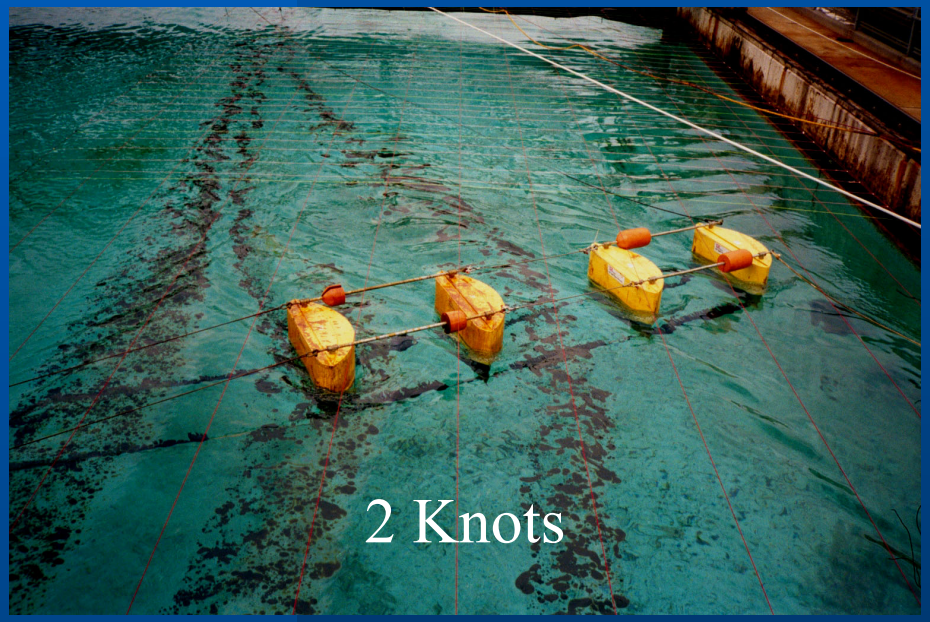

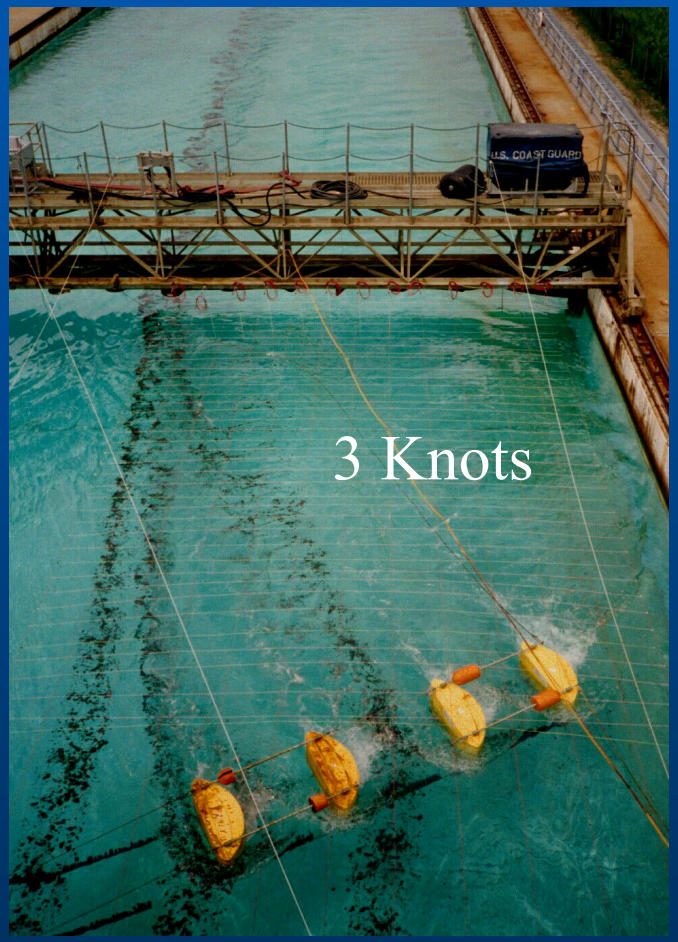

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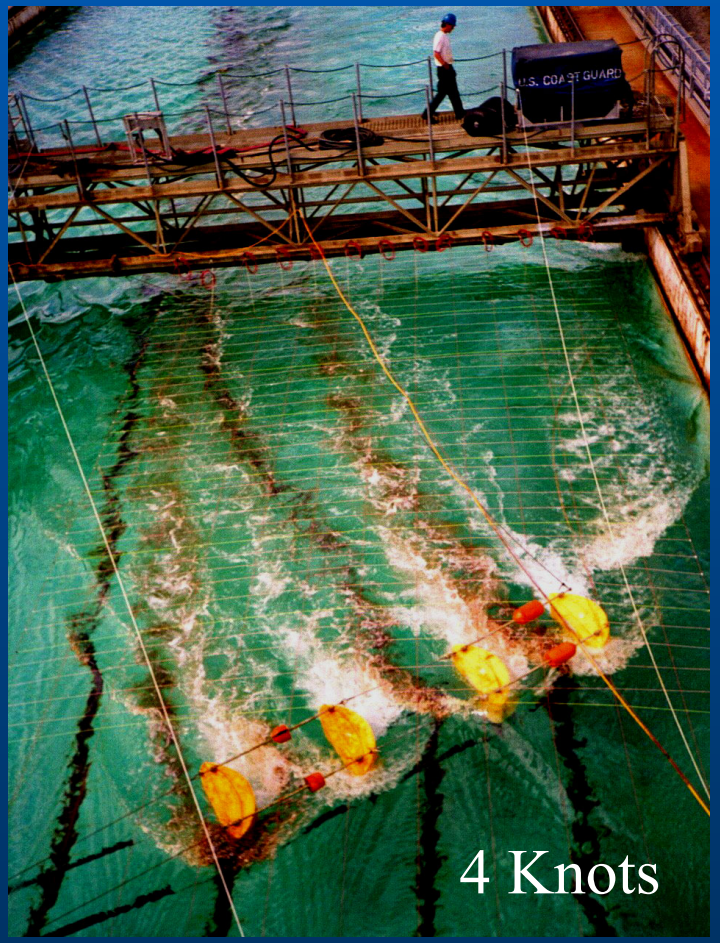

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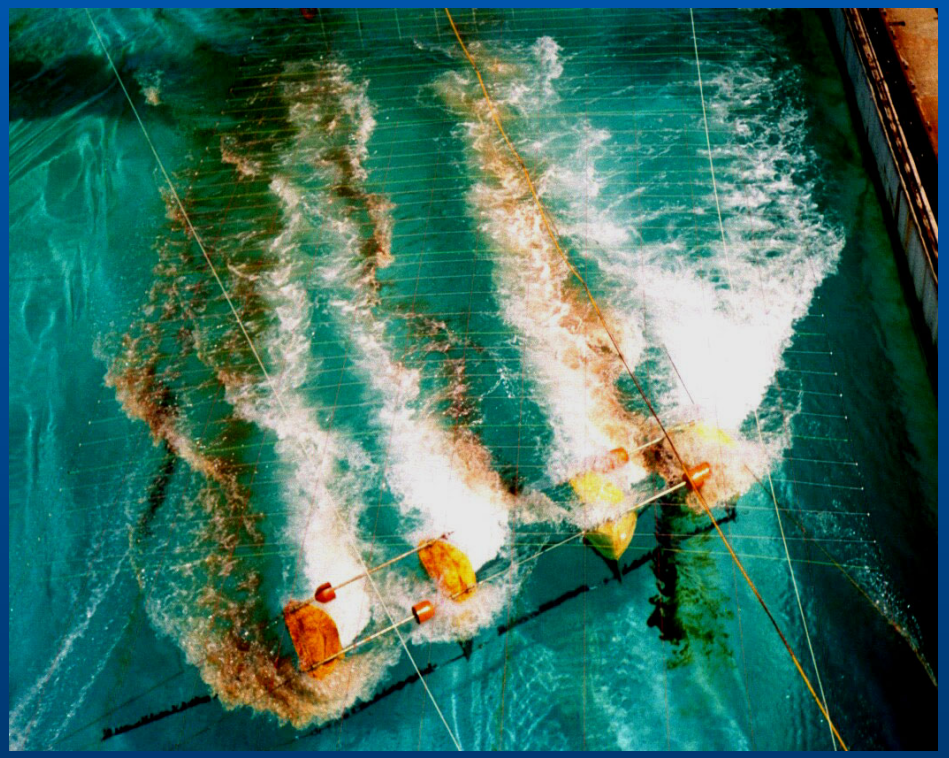
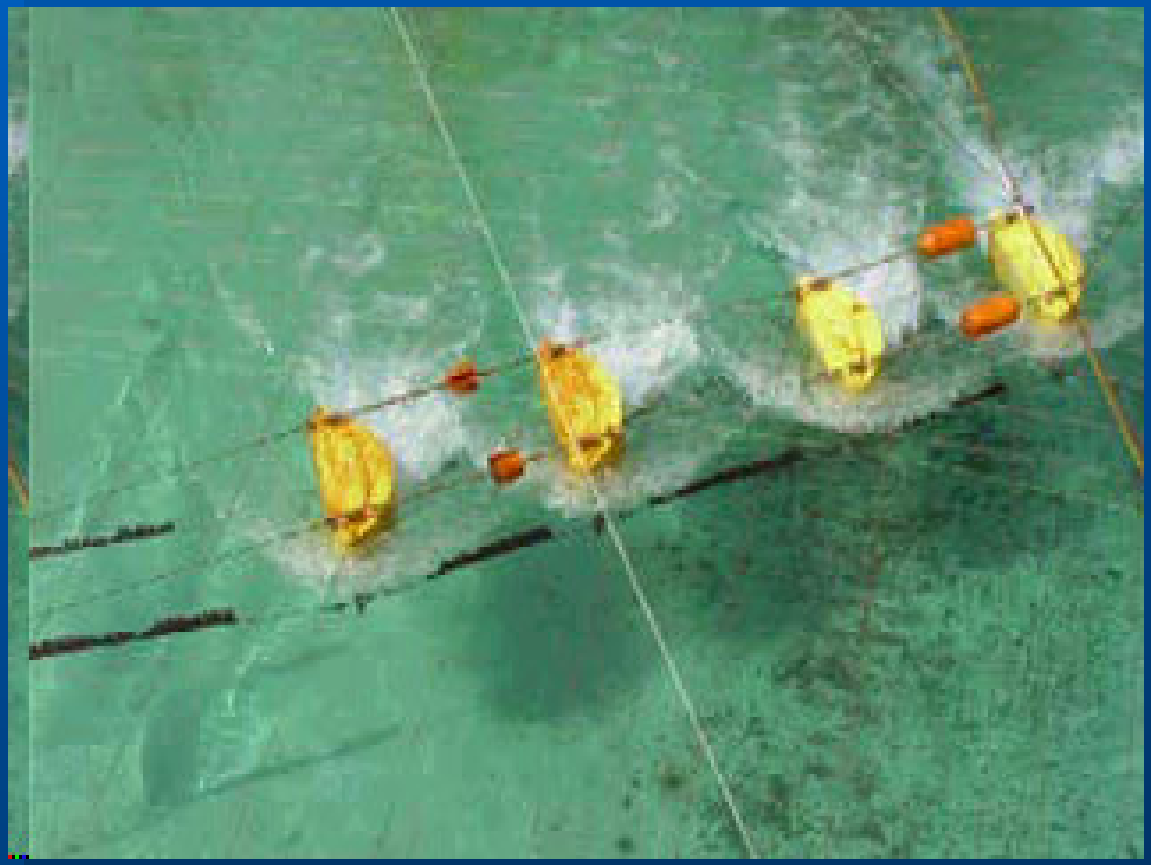
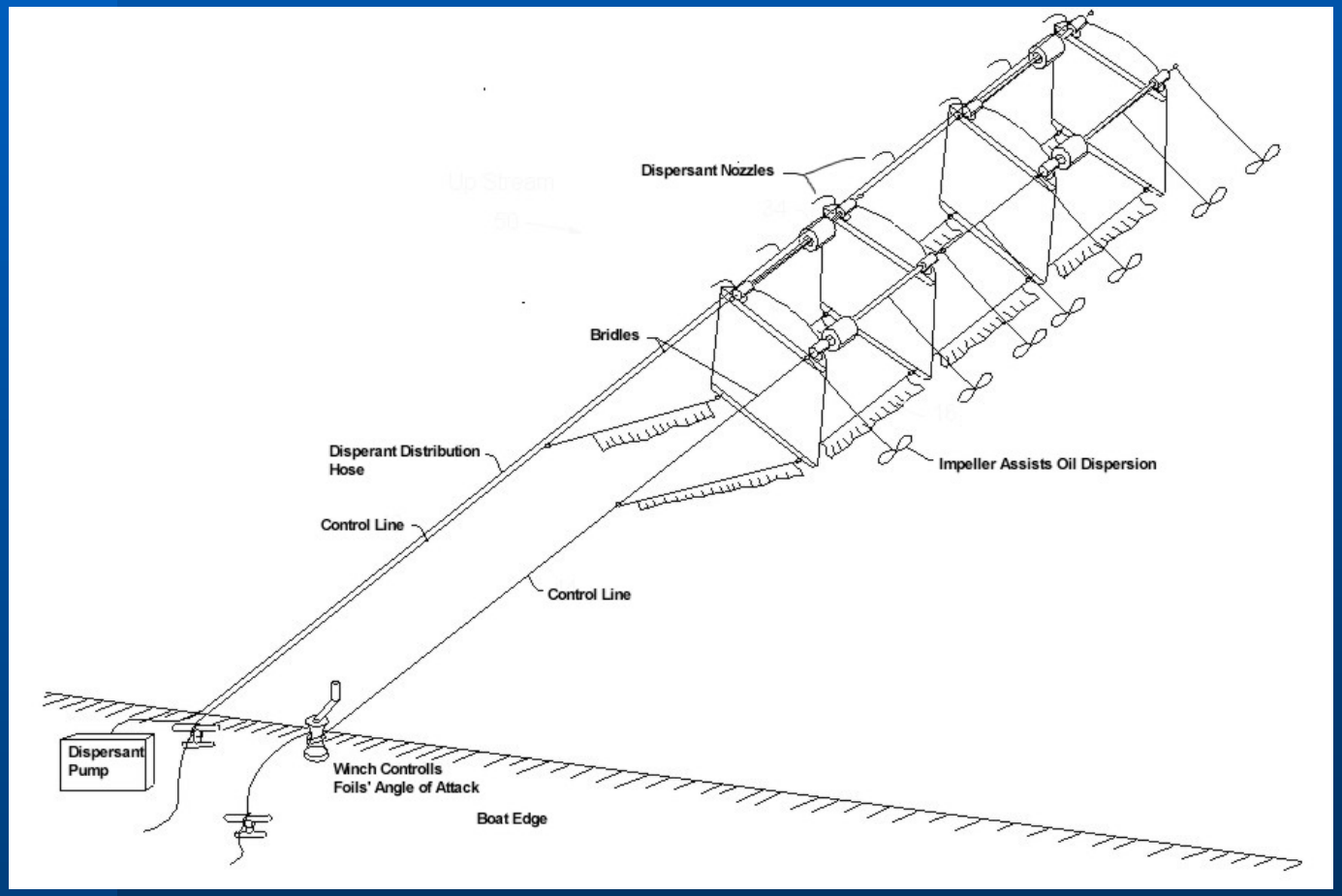


Some Diesel Mixing at 5 Kts but Diversion was still Effective

Di



- Deploy deflection boom or other equipment from shore out into the current without use of anchors/boats
- Deflect and concentrate oil with two diverter strings deployed from a vessel for skimmer pickup and recovery
- Dispersion of an oil spill in calm seas
  - Distribution of dispersants & mixing
- Insitu Burn support (diversion or water mist)



Pr

- Higher speed 7+ knots (less turbulence)
  - Longer 8-foot hulls (lower wave making drag)
  - Lower beam to length ratio (more streamlined)
- Shallow water capable
  - Centerboard design (4” to 24” draft)
- Twice the diversion sweep per catamaran (from 4 feet to 8 feet)
- Lighter weight

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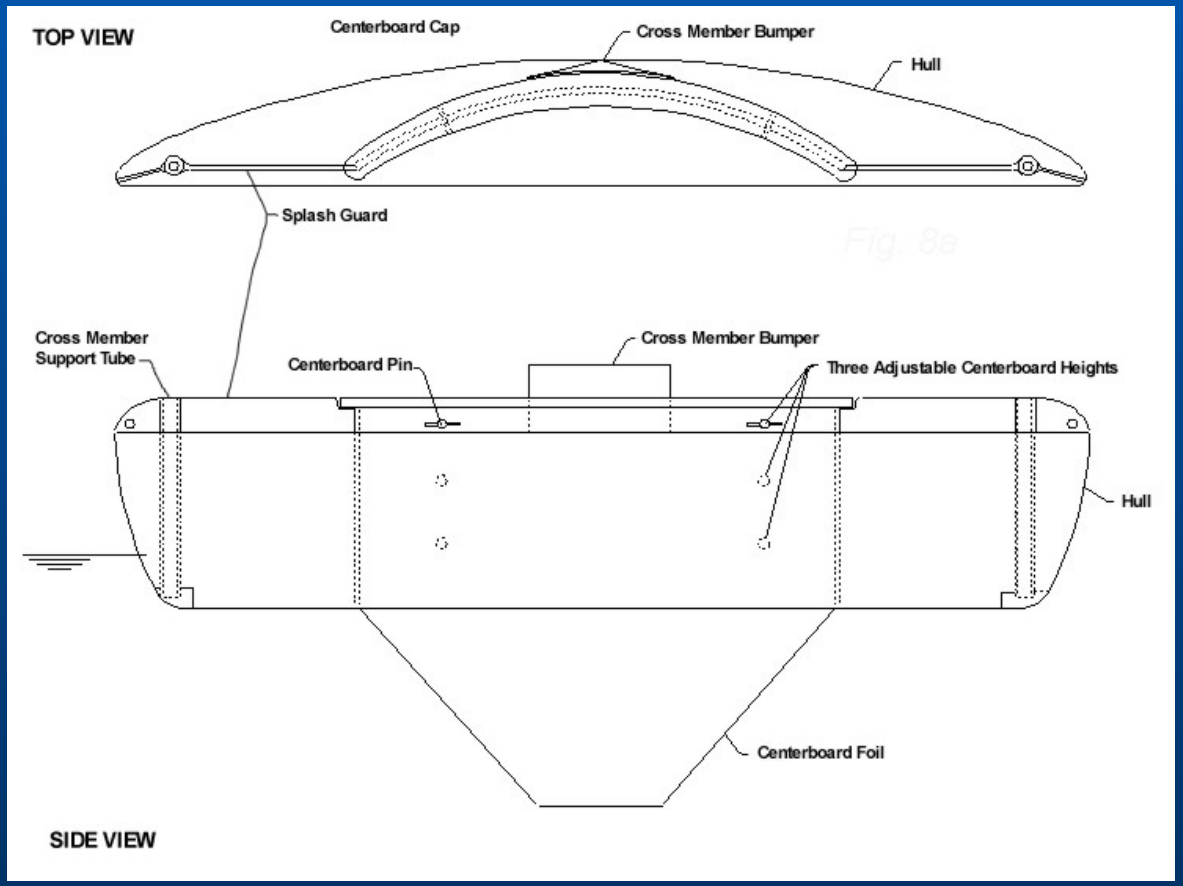
- Adjustable centerboard height
- Slanted foil - more debris tolerant
- Still fits into pickup truck - 4 abreast



Oil

- Production Model later in 2002
- Looking for demonstration opportunities

- Distributed by:

Hyde Marine Inc.,
28045 Ranney Parkway
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www.hydeweb.com

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