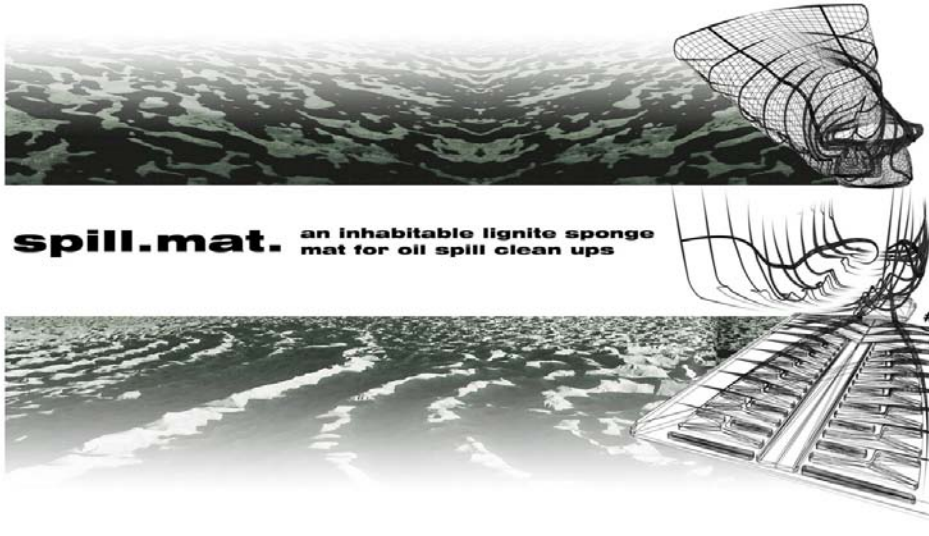


spill.mat.

an inhabitable lignite sponge mat for oil spill clean ups

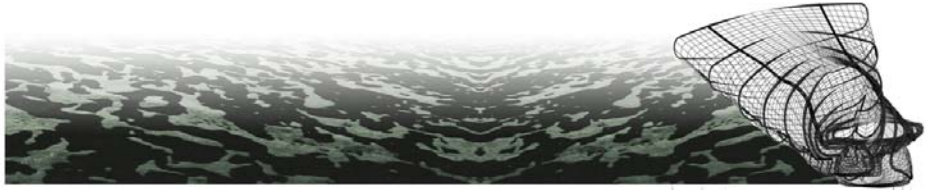
#97

wayne jenski

Water born oil spills frequently devastate environments world wide; many efforts are made to contain the disaster, but inevitably the poison spreads to beaches where efforts to collect it are limited. This project is sited in the area of greatest impact: between high and low tide. Spills proliferate off the coasts of Alaska which presents accessibility problems during clean up efforts; for this reason its beaches were selected as the environment.

The Spill Mat is a composition of layers, forming a fabric of 36'x36'. The strata in contact with the skin of the beach are a formation of lignite resin sponge and dyneon that forms a vascular network for collecting oil and storing it in a sack-like reservoir. Anchored at the corner, the fabric is allowed to float and pivot at high tide to cover and clean adjacent areas. Working as a sort of colony, a few dozen mats could clean a beach in tandem during the tide cycles.

At high tide, the fabric is exposed to 34-44 degree Fahrenheit water which activates a nitinol mesh within its layers to form it into a floating environment for the workers who would otherwise have to set up a temporary camp or be air lifted back and forth everyday. The Spill Mat is set back down at low tide, where it flattens and begins to collect the newly deposited oil from the tide.



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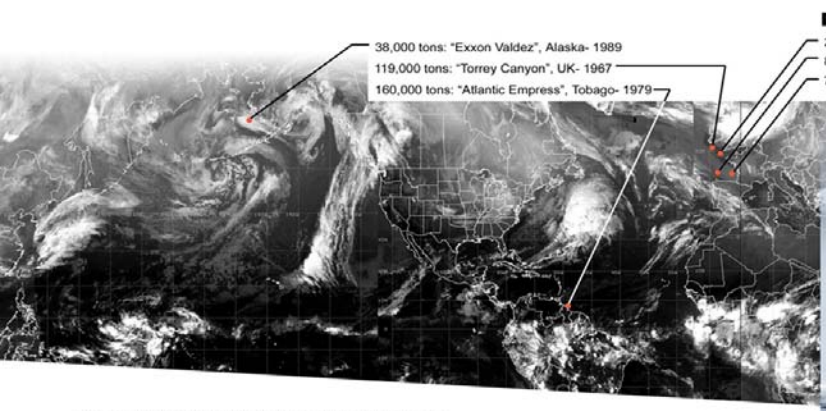
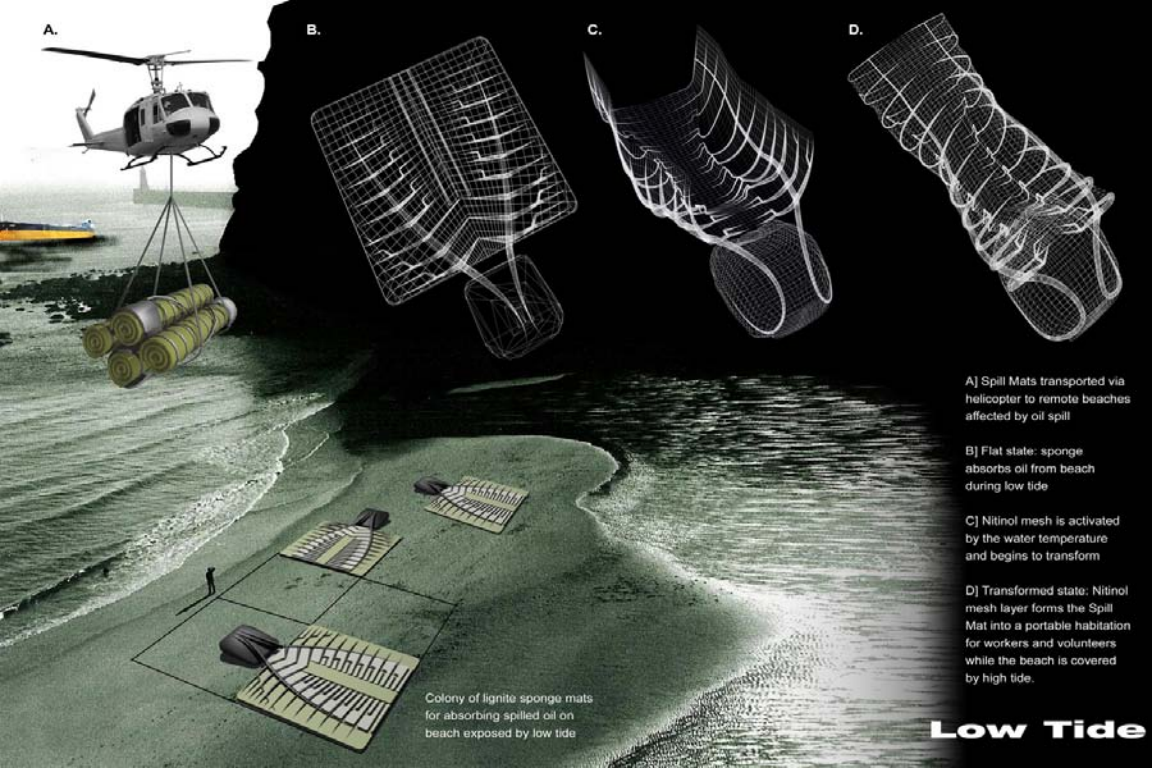
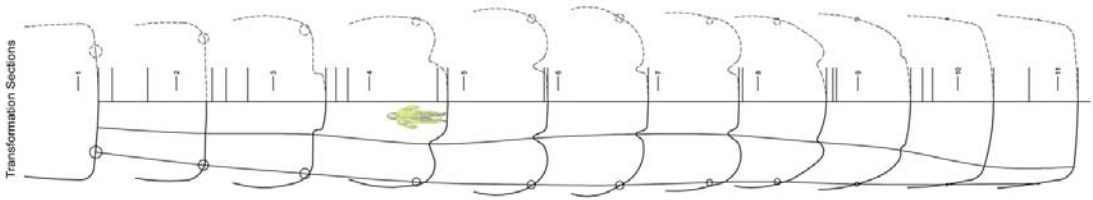
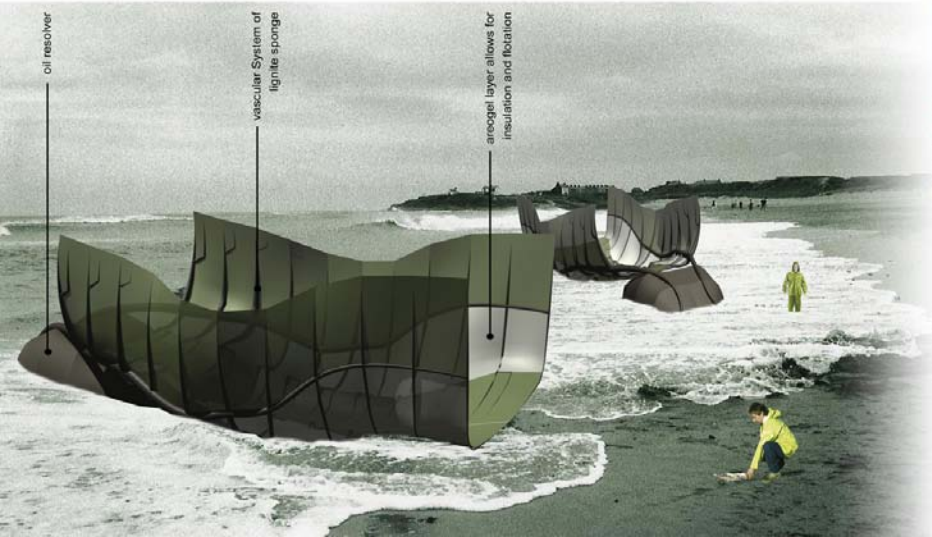


More than 300 oil spills over 10,000 gallons occur per year.

The goal is to remove and reclaim the spilled oil without adding to the problem. Oil is a necessary fuel of technology; this is a proposal to utilize technology to repair the damages.


A.
B.
C.
D.
Colony of lignite sponge mats for absorbing spilled oil on beach exposed by low tide
A] Spill Mats transported via helicopter to remote beaches affected by oil spill
B] Flat state: sponge absorbs oil from beach during low tide
C] Nitinol mesh is activated by the water temperature and begins to transform
D] Transformed state: Nitinol mesh layer forms the Spill Mat into a portable habitation for workers and volunteers while the beach is covered by high tide.
Low Tide





The 35 degree water of the Pacific activates the nitinol mesh layer while the tide is rising, causing it to begin to morph into a shelter for the volunteers.

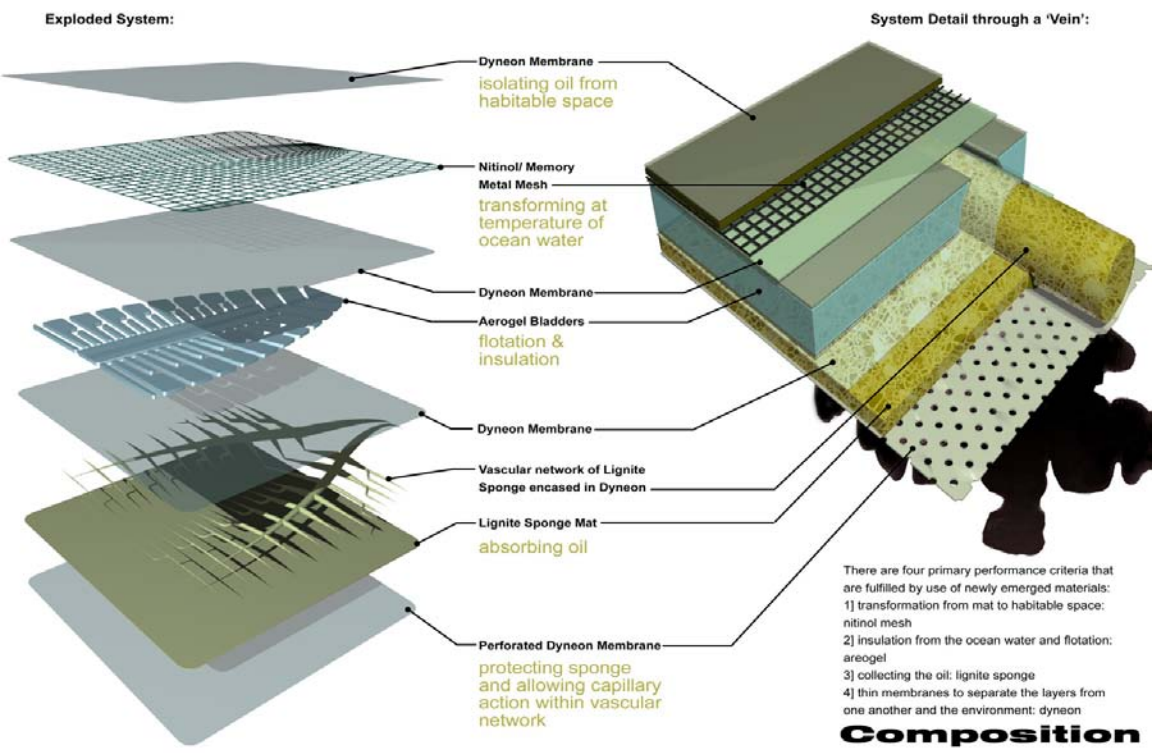
Mid Tide

The shelter formed by the Spill Mat is intended to be used for rest while the beaches are covered by high tide. Some modules are to be used as cleaning stations for affected sea life. When the tide recedes, a new deposit of oil will be left on the beach for the Spill Mat and volunteers to collect.

High Tide

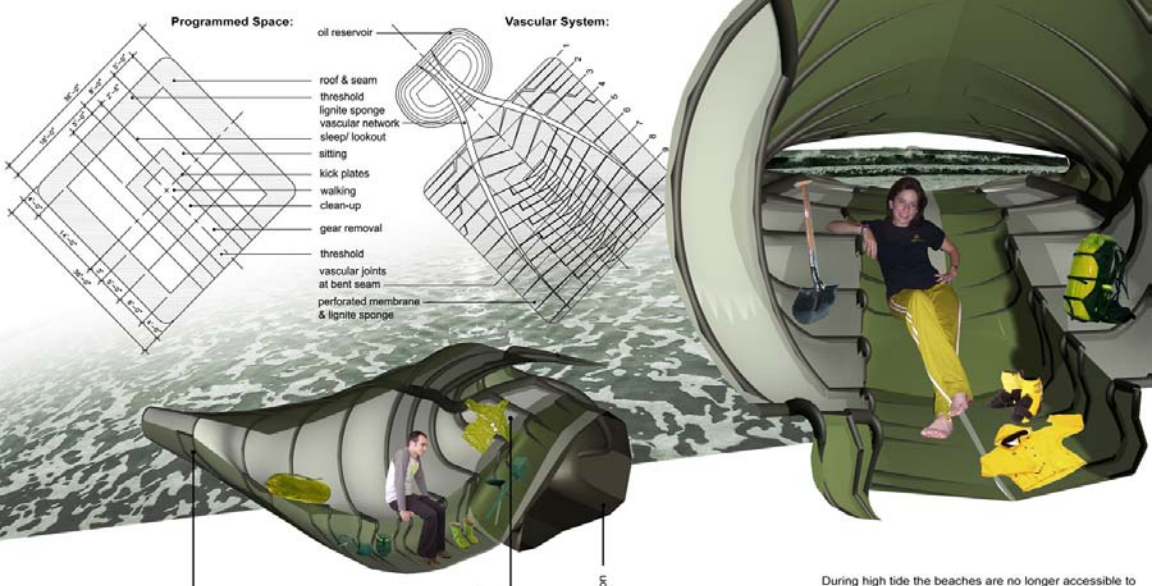
Exploded System:

System Detail through a 'Vein':



There are four primary performance criteria that are fulfilled by use of newly emerged materials:
1] transformation from mat to habitable space: nitinol mesh
2] insulation from the ocean water and flotation: areogel
3] collecting the oil: lignite sponge
4] thin membranes to separate the layers from one another and the environment: dyneon

Composition



During high tide the beaches are no longer accessible to clean up. Instead of flying volunteers in and out everyday a mobile camp can be formed by the Spill Mat's nitinol layer being activated by the cold ocean water.

Habitability