

Lessons Learned from Deepwater Horizon Spill: Response Engineer's Perspective

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Discussion Topics

- Area Contingency Plan
- Unified Command
- Public Information/
Interaction
- Boom in Fast Currents
- Oil Spill Modeling



Area Contingency Plan (ACP)



- Last updated in 1990's
- Did not include boom plan for all environmentally sensitive areas
- Not fully vetted by local government
- Boom configurations that could not be constructed or maintained



Evolution of ACP in Okaloosa County



Chevron
Original Permit
May 2010
USCG denied



Pile supported
shoreline segments
June 2010
(deployed)



Bay Alternative
(interferes with
recreation)
Open Chevron
(State EOC suggested)
Outside Pass
(USCG suggested)



ACP 1995



ACP
May 2010



ACP-less boom
June 2010
(failed to deploy)



Final Plan
(USCG/ CPE Joint Effort)

ACP Issues

- Did not address local needs
- Availability of resources impacted deployment
- Boom plan was not sustainable or effective under local conditions
- Plans were not communicated effectively to local government, State EOC or public

Recommendations for ACP

- ACP should be revised to incorporate lessons learned and new designs used during Deepwater Horizon response
- Substandard approaches should not be deployed. Failure wastes time and increases risk. All strategies should be fully deployed and tested before becoming part of the ACP.

Recommendations for ACP

- Boom strategies should be based on research and high-quality sources of information on local conditions
- ACP strategies should be pre-approved by local government, open to public comment, and the State EOC.



Unified Command (UC)

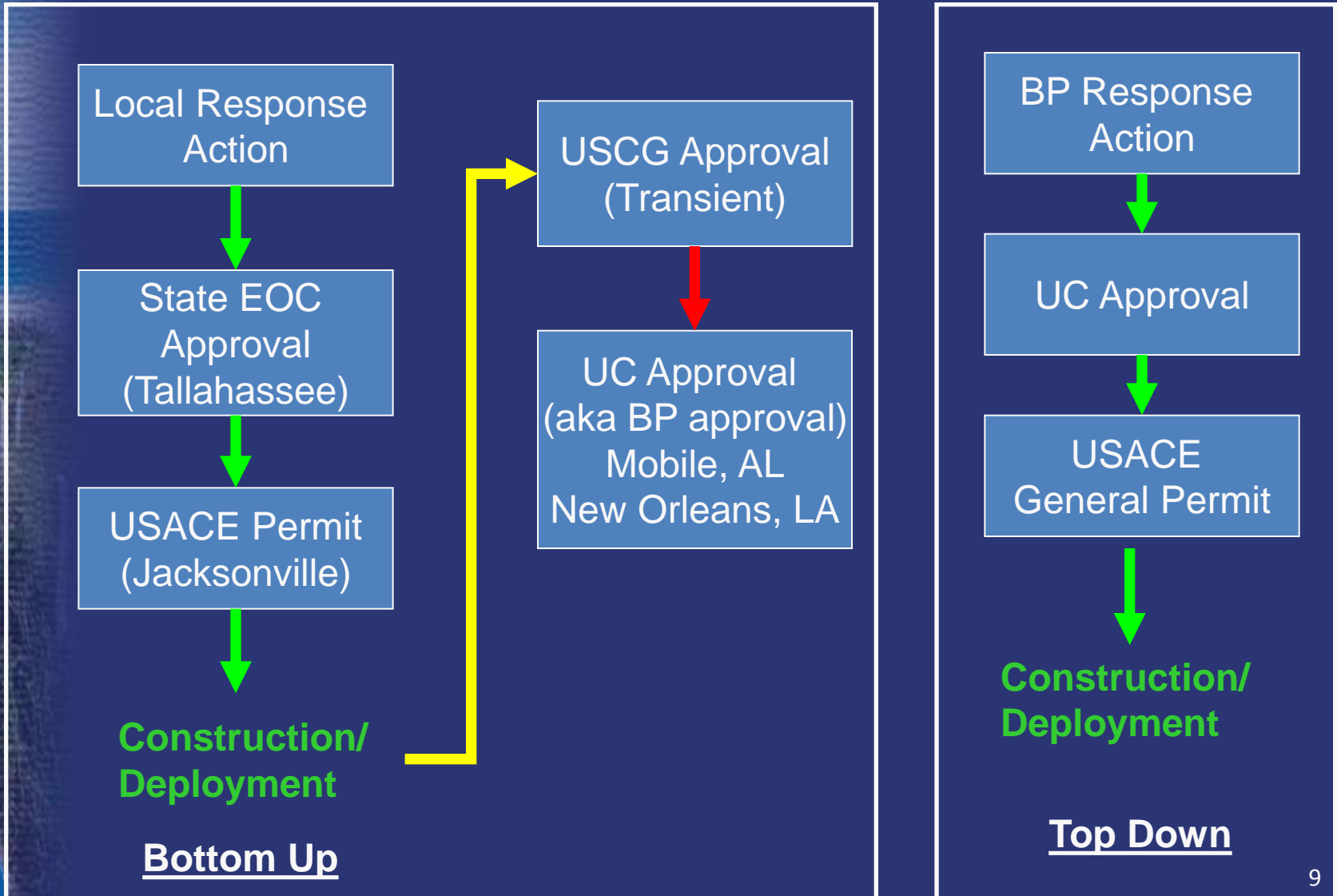
- **BP:** authority to approve or deny local/ state response activities
- **Transocean**
- USCG
- MMS, NOAA, US EPA
- US Homeland Security
- US DOI, DOD, FWS, NPS, Dept of State, USGS, CDC, OSHA

- UC based in Louisiana
- Incident Command Center in Mobile, Alabama

State EOC and local government were not part of UC!



Example Approval Process



UC Issues

- **BP authority** prevented permitted, state approved local action items from being implemented
- **State/ local government** were not involved in UC response
- Consistent **miscommunication** between local/ state level and UC
- **Continuous rotation** of USCG and BP reps slowed progress and increased confusion/ miscommunication
- UC stalled local response activities while preparing **conflicting response plans**

Recommendations for UC

- Responsible party should not have final authority on response actions.
- The State and local governments should be part of UC and have lead authority over response actions.
- Individual UCs should be located in each state with full decision making authority.



Recommendations for UC

- Team of spill response experts should be continuously cultivated within the USCG. These experts should be assigned to each county/ area and not rotated.
- UC agenda of response actions should be transparent, publicly accessible and not conflict with state or local response.

Public Interaction

- Public wanted to see boom but not have it interfere with recreation



Wet Staging



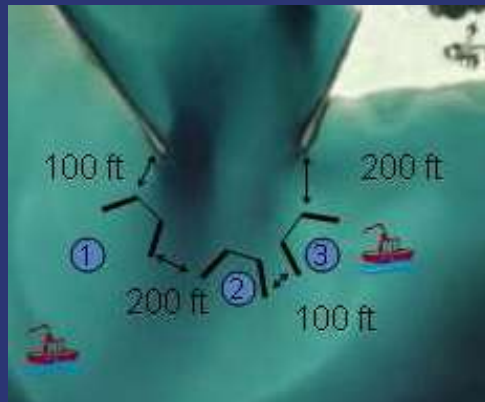
Crab Island



- ✓ Need to have clear decision making process for full deployment that includes local government input and public notification
- ✓ Public use needs to be considered in contingency planning

Public Influence on Design

- Public driven political pressure heavily influenced design of protection measures



Barge Plan



Air Curtain

- ✓ ACP needs to be comprehensive, fully vetted, and tested prior to incident
- ✓ Protection measures should be based on research and proven methodology

Public Information

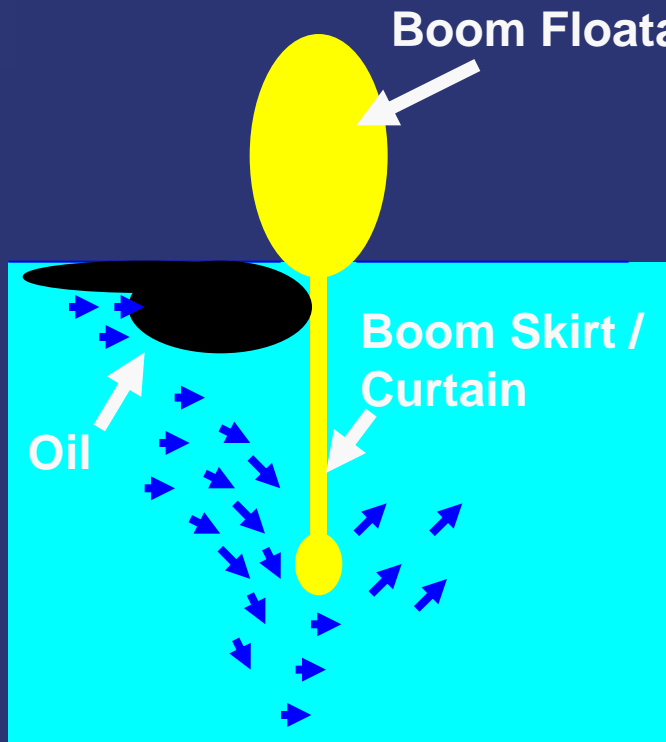
- Local dissatisfaction with SERT Gator website led to daily beach monitoring



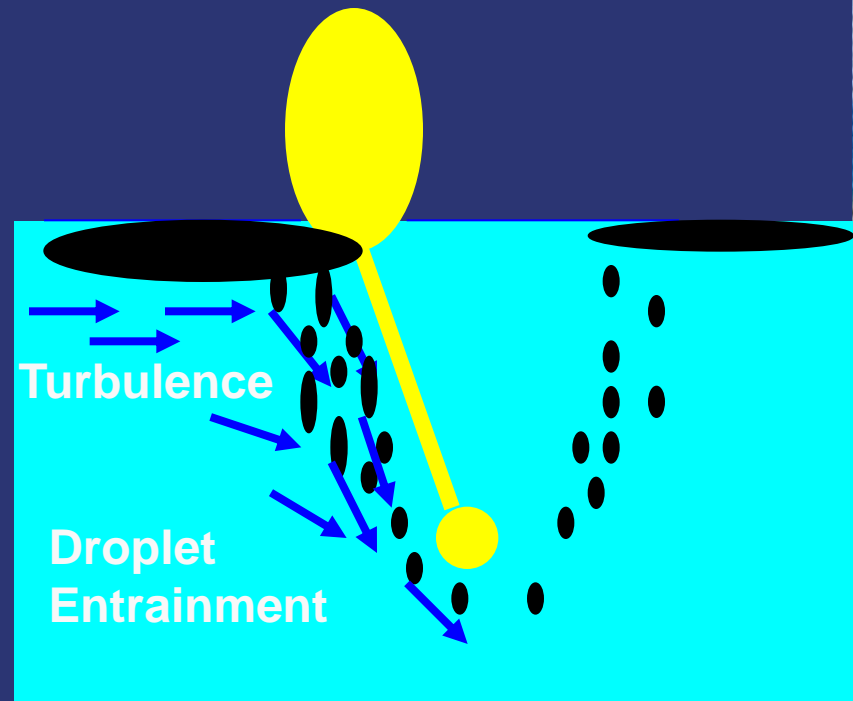
- ✓ Any public database has to consider impact of color schemes, overload of information, and potential of misinterpretation on tourism and public opinion
- ✓ End product should be tailored to user's needs



Boom in Fast Currents

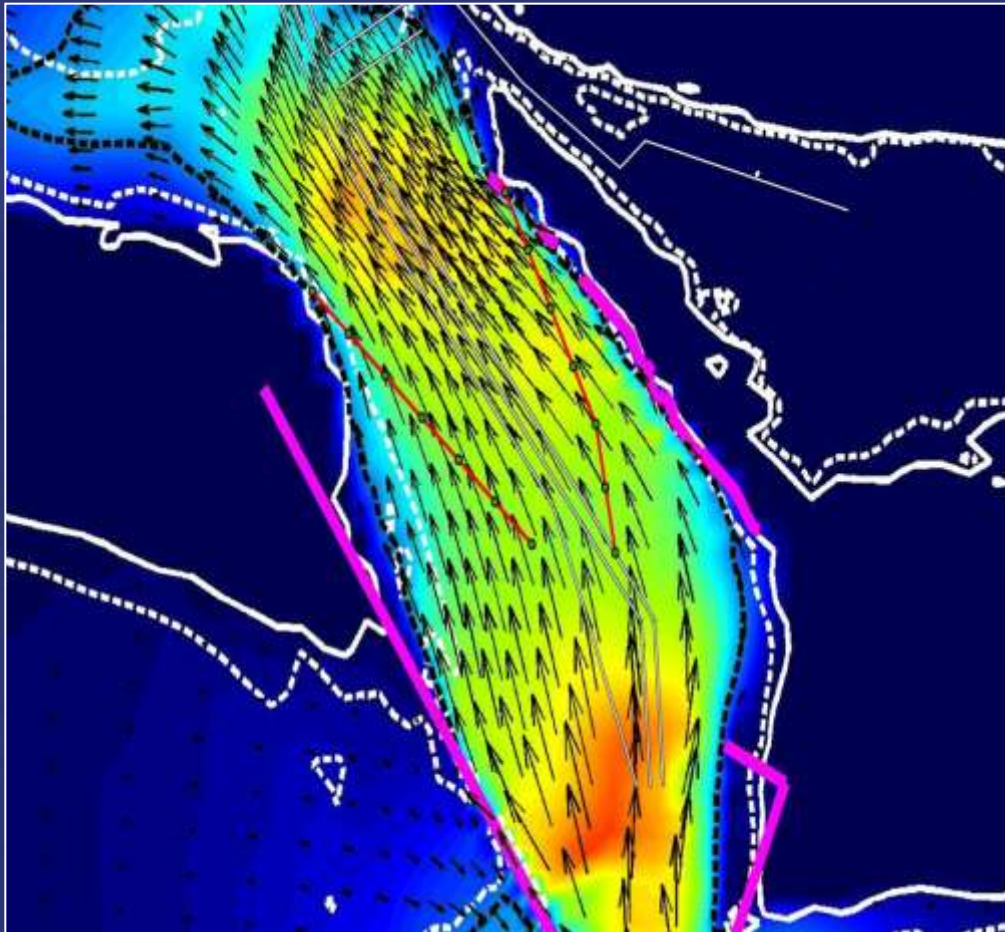


Less than 0.7 knots



Greater than 0.7 knots

Hydrodynamic Modeling



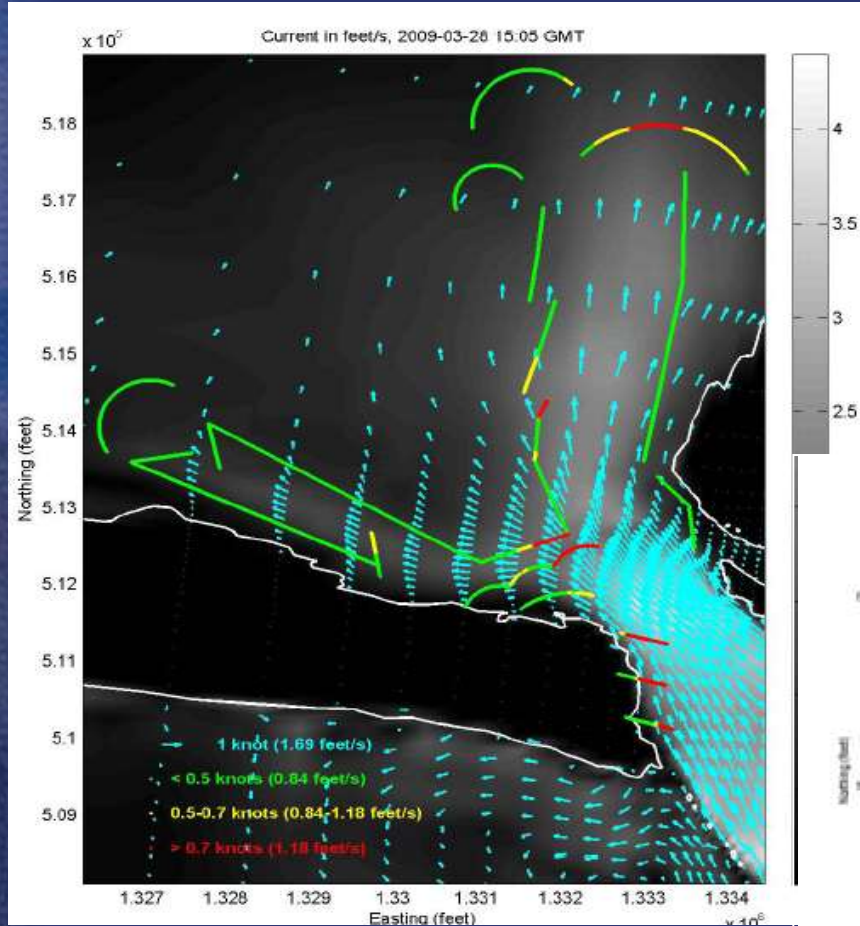
Known current speed and direction at all locations

Boom angle can be adjusted to reduce current speed relative to boom

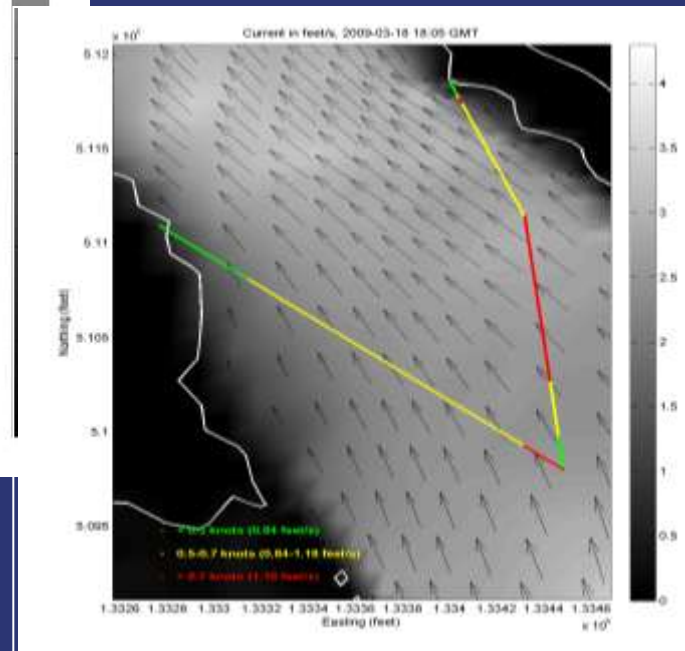
Forces along boom can be calculated at all locations

Can avoid failure of boom!

Boom Analysis Program



Quickly shows areas likely to fail based on hydrodynamic model

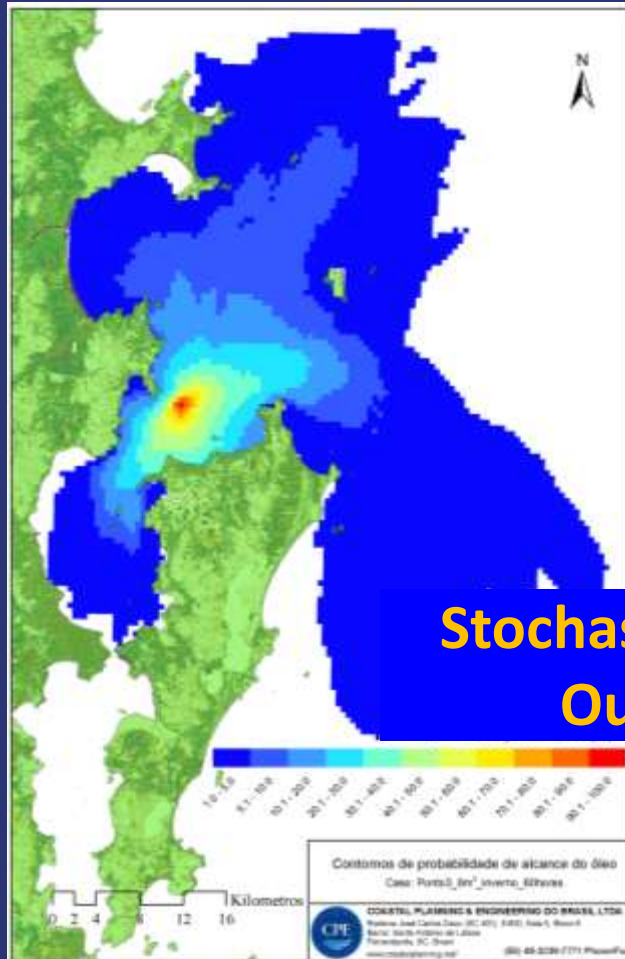


Recommendations for Inlets

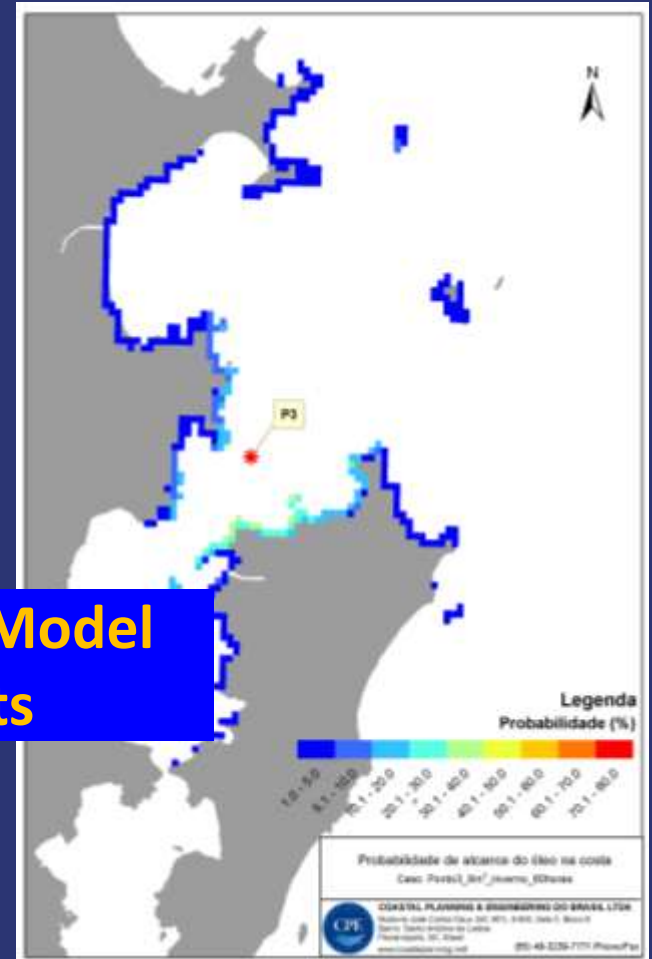
- Booms should be angled so that the relative current speed is less than 0.7 knots
- Forces should be calculated to determine appropriate anchoring system or piling support system
- Proper resources i.e. powerful boats should be used to deploy
- Increased floatation/ freeboard prevents boom from being pulled under

Modeling & Contingency Planning

Modeling is an **essential** component of contingency planning.



Water Probability

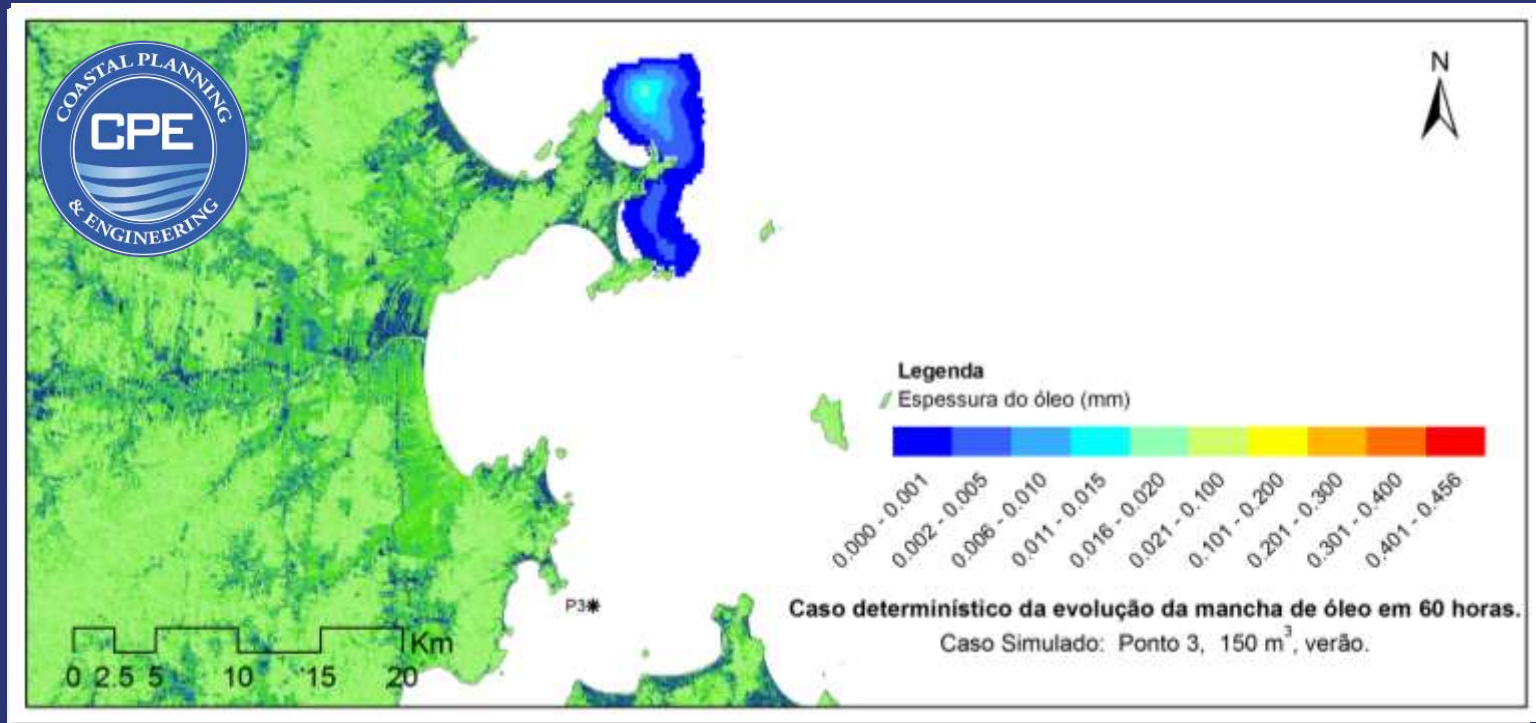


Shore Probability

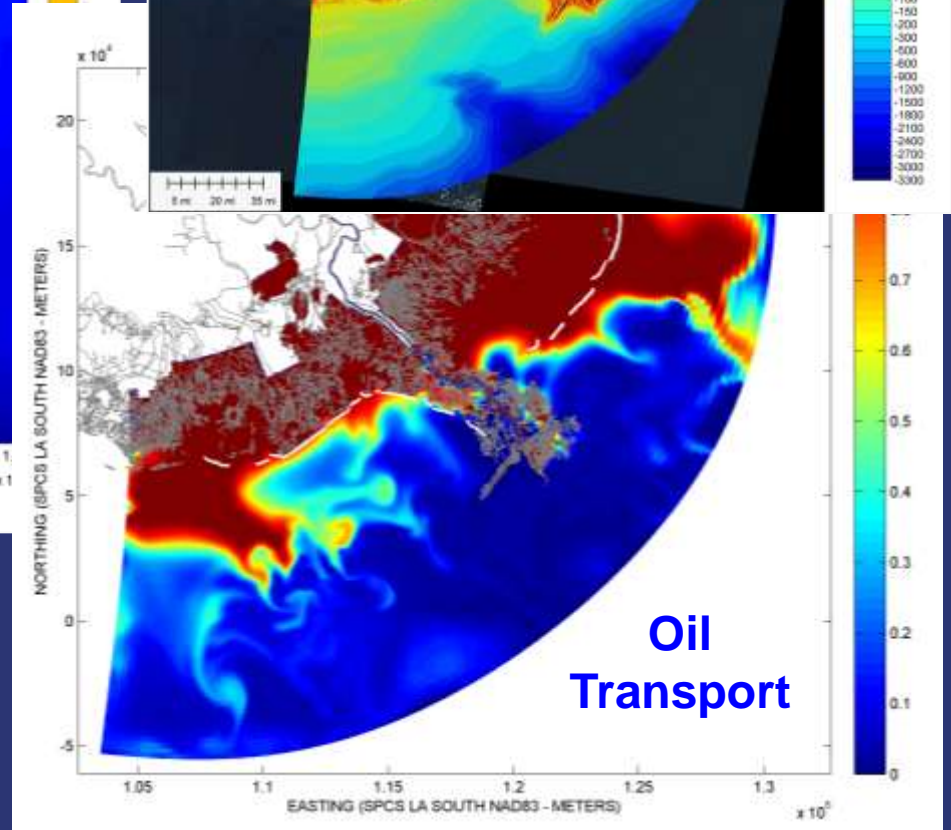
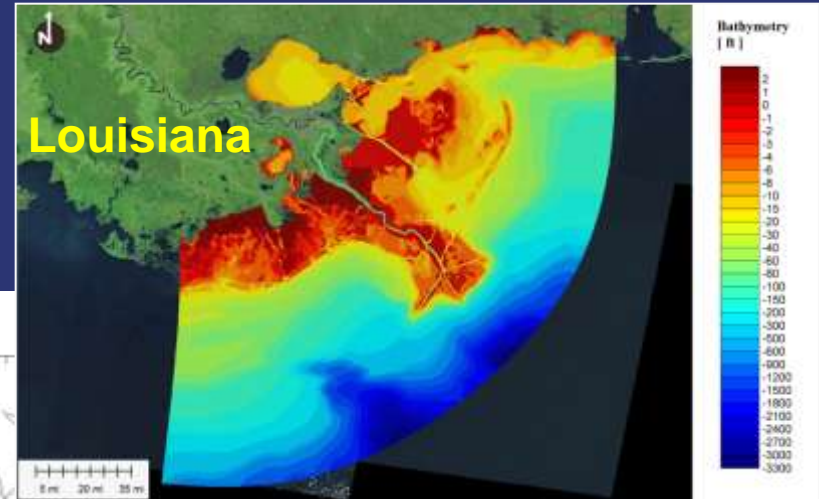
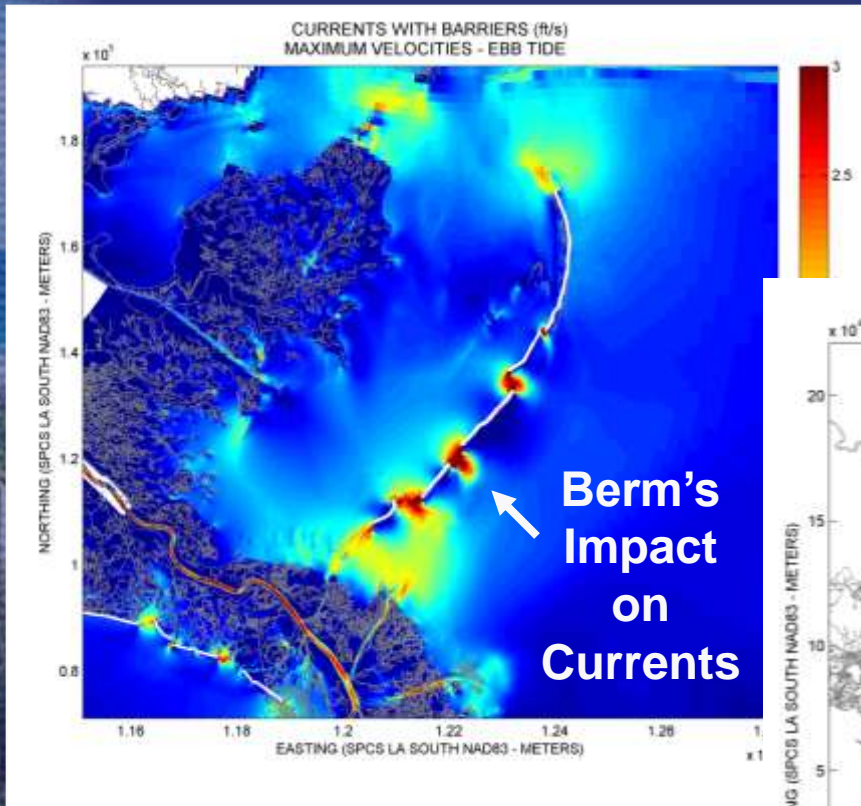
**Stochastic Model
Outputs**



DETERMINISTIC MODULE FOR THE WORST CASE SCENARIO



Berms in Louisiana



What we should be modeling...

- Spill scenarios from offshore rigs, pipelines, tankers and fixed facilities near ALL at risk sites
- To determine sites at greatest risk and identify natural collection areas and response needs
- Hydrodynamics of all areas where protection measures would be deployed
- Submerged oil transport in the nearshore

Summary

- Need to revise Area Contingency Plan
- Need to review/ restructure Unified Command
- The public is a major factor in response planning
- Boom **CAN** be deployed in fast currents if a technical approach is taken
- **Modeling is essential for contingency planning** and should be performed now



THANK YOU

