2013 SMART Progress Report

Brian Parscal

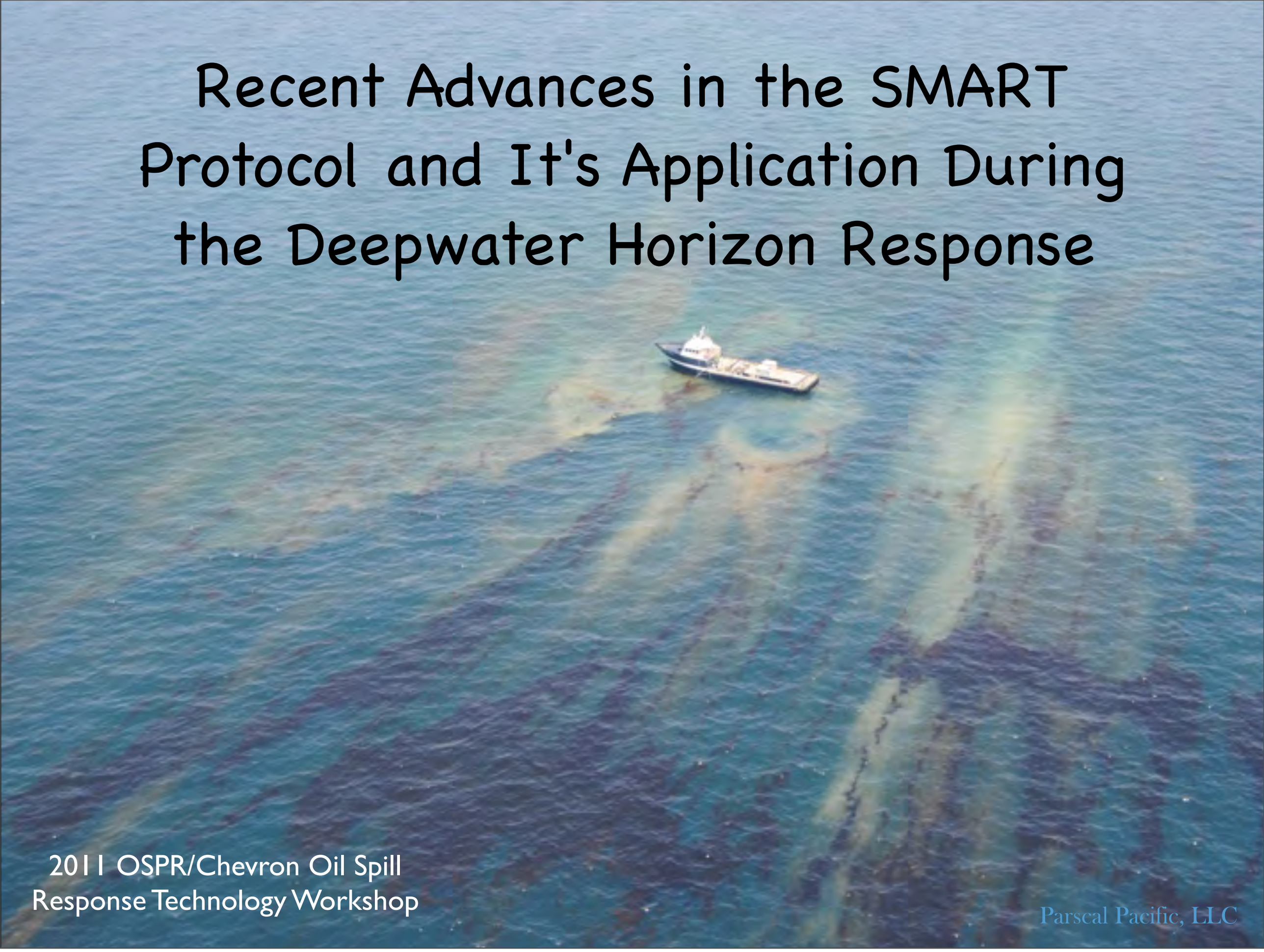
Parscal Pacific, LLC

SPECIAL MONITORING of APPLIED RESPONSE TECHNOLOGIES

Developed by:

U.S. Coast Guard
National Oceanic and Atmospheric Administration
U.S. Environmental Protection Agency
Centers for Diesease Control and Prevention

Recent Advances in the SMART Protocol and It's Application During the Deepwater Horizon Response



Last time we met I talked about the developments we've made to the SMART program in recent years and about our experiences during the DWH response. Needless to say, we learned a tremendous amount from our experiences in the Gulf. For me, I came away from that experience with a better understanding of what a comprehensive SMART program should look like.

So, what did we learn?

- Like most aspects of oil spill response we can always count on the fundamentals:
  - Planning
  - Preparation
  - Practice

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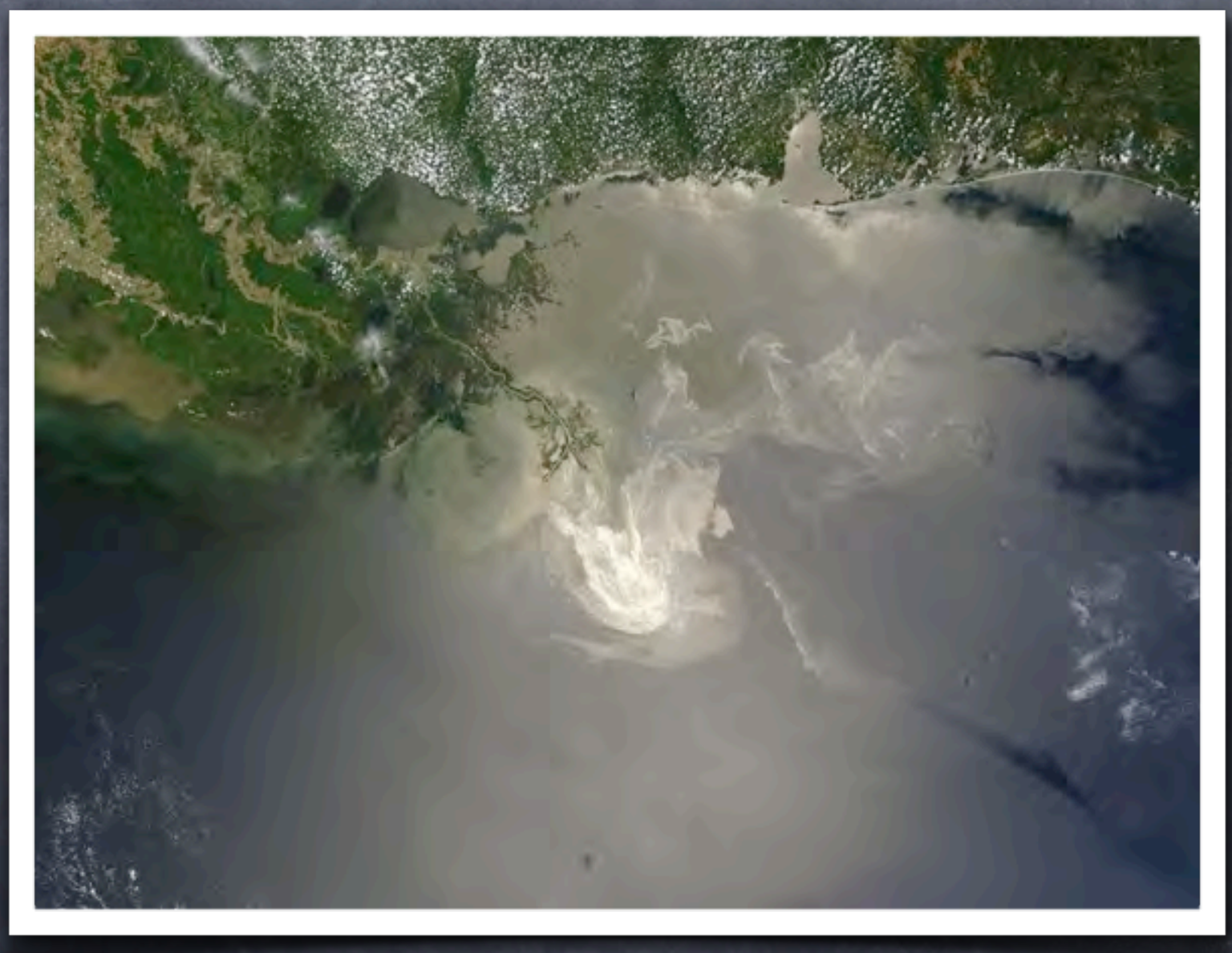
I ended my talk at the last workshop with my thoughts on what we learned from our DWH experiences and what we need to improve on to make SMART a viable response tool. Today I'd like to re-visit those topics and let you know what progress we've made towards addressing those shortfalls in the SMART program.

Back then, when I thought about how we can develop a comprehensive dispersant monitoring program, I fell back on something Al Allen taught me many years ago: "The Three P's of Oil Spill Response".

Today, I'll stick with that formula and give you an update on the progress we've made in each category.

Planning

- Plan for the worst case scenario, even the unimaginable.



-Let’s start with Planning.

-In 2011, I recommended we adjust the way we plan for a SMART response.

-Who could have imagined **90 days of dispersant operations**?
-61 days of spraying!
-12 spray aircraft.
-412 spray sorties.
-18,000 square mile operating area.

-SMART needs to be scalable to address any size response.

-Like most involved in the DWH response, The SMART teams were quickly stretched to the limits by the scale and duration of the event. That lesson has been well learned and I feel we are now better positioned to respond to a large scale event.

-The good news... The day-to-day SMART process is pretty much the same regardless of the size and duration of the response. However some things to consider early on:

-Vessels appropriate to the operating area...

Choose vessels appropriate to the operating area and conditions.

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-Select vessels appropriate to the operating area and duration of the response:
Larger vessels are preferred for a larger response.

Consider the communications and logistical needs of a large scale response.

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-Communications is always a challenge. More so in a large operating area.

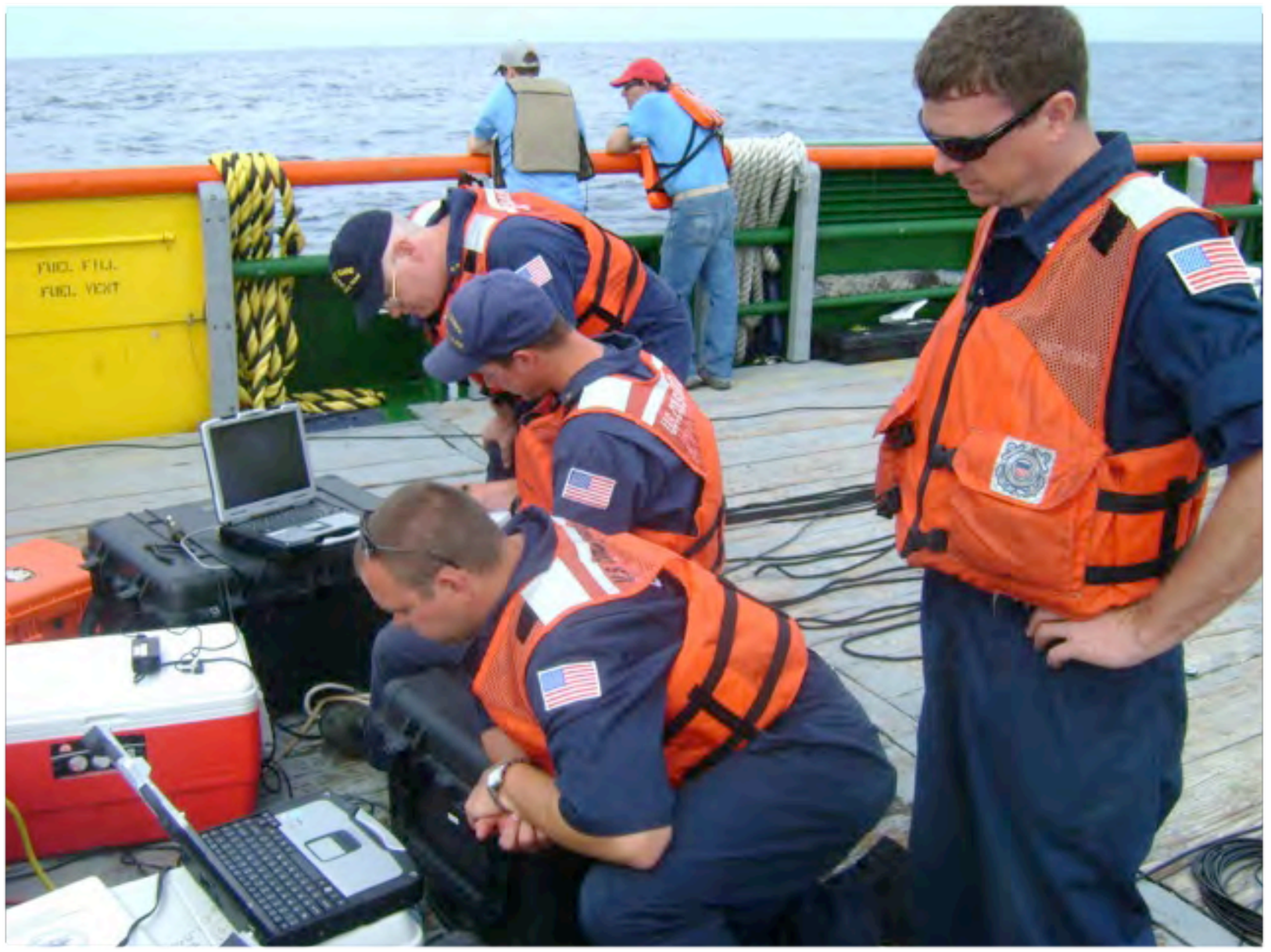
-Forward operating base.

-The Strike Team's Mobile Command Post served well as a forward SMART Base.

-It was valuable in facilitating communications between the Field and Command Houma.

-It also facilitated the transport of water samples from the Field to Command.

Plan for the rotation of Team members in the event of a prolonged response.



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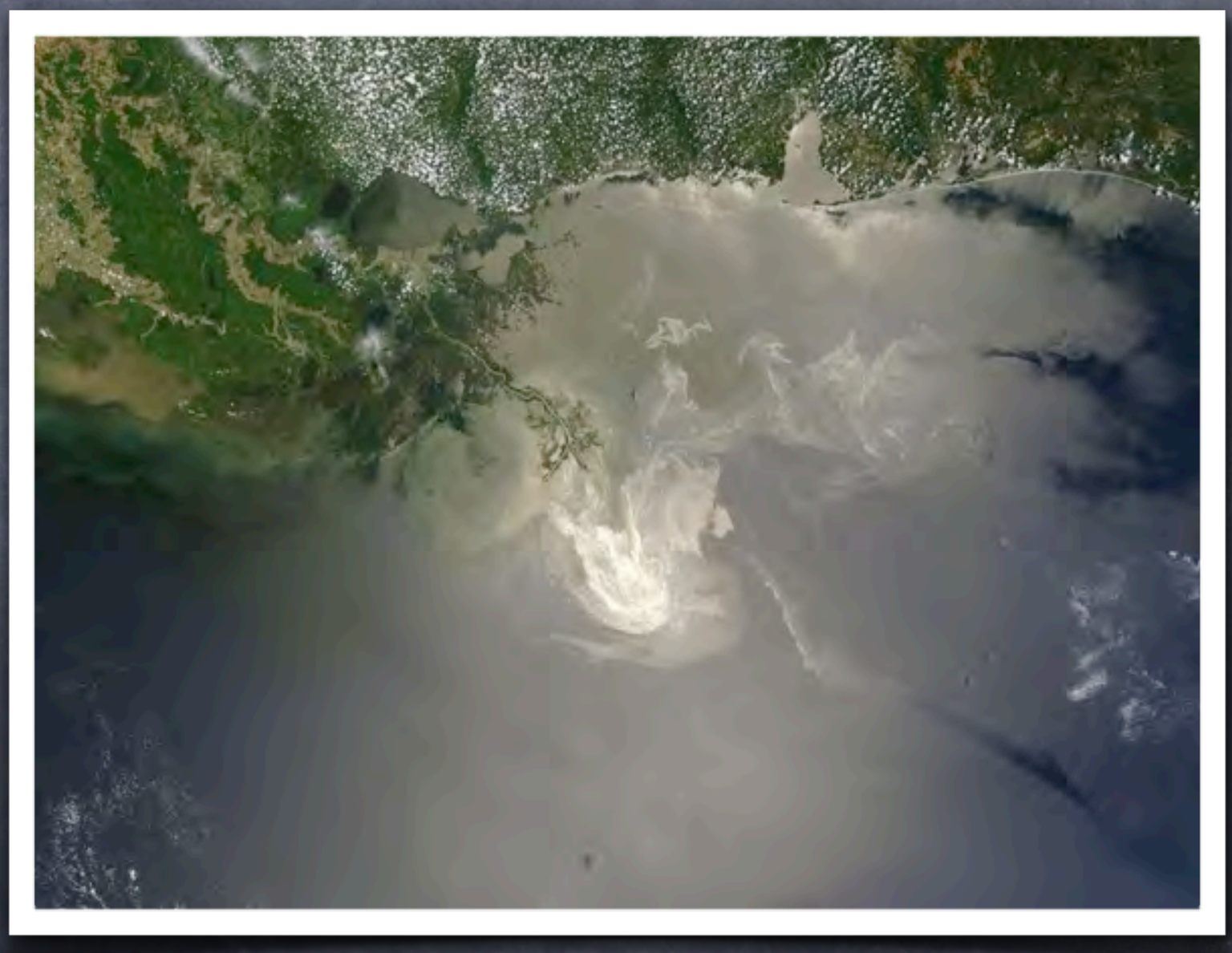
-Like most Response operations involved in the DWH, SMART suffered from the rotation of personnel in and out of the response.

-Be reasonable about the number of SMART Teams needed to provide adequate information.

More SMART Teams does not necessarily equate to more and better data!

Planning

- Plan for the worst case scenario, even the unimaginable.



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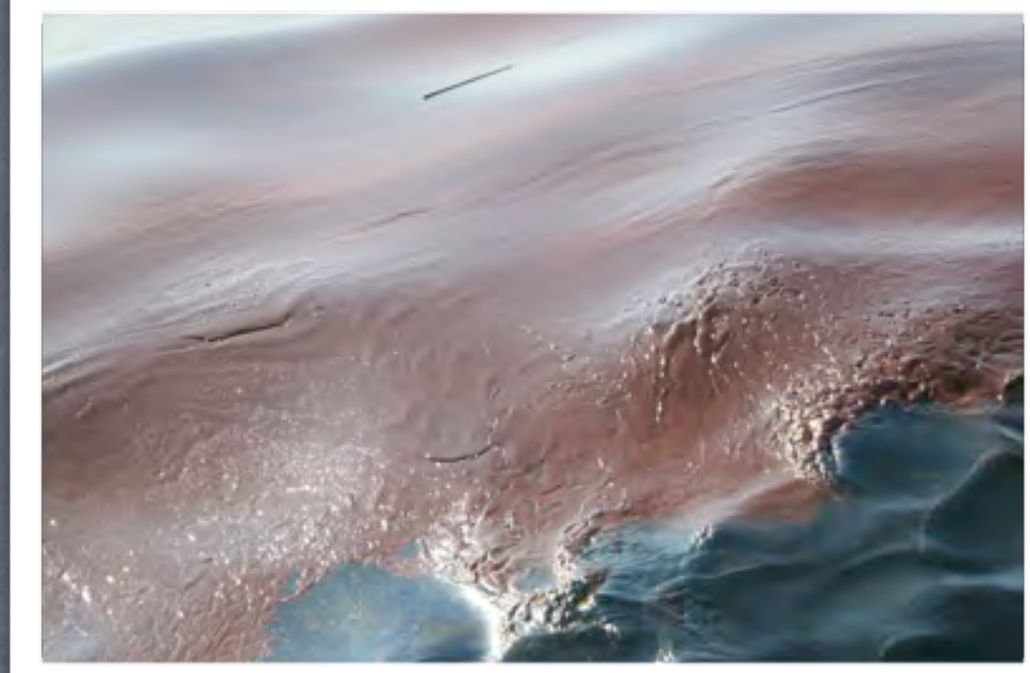
-I believe we've learned the lessons of planning for a large scale response.

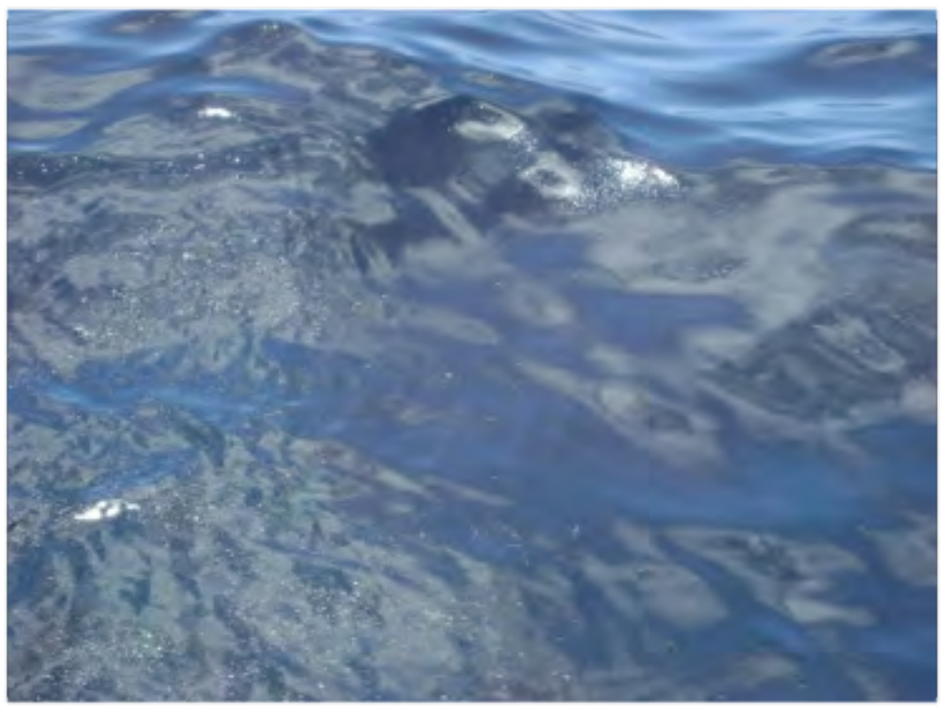
Planning

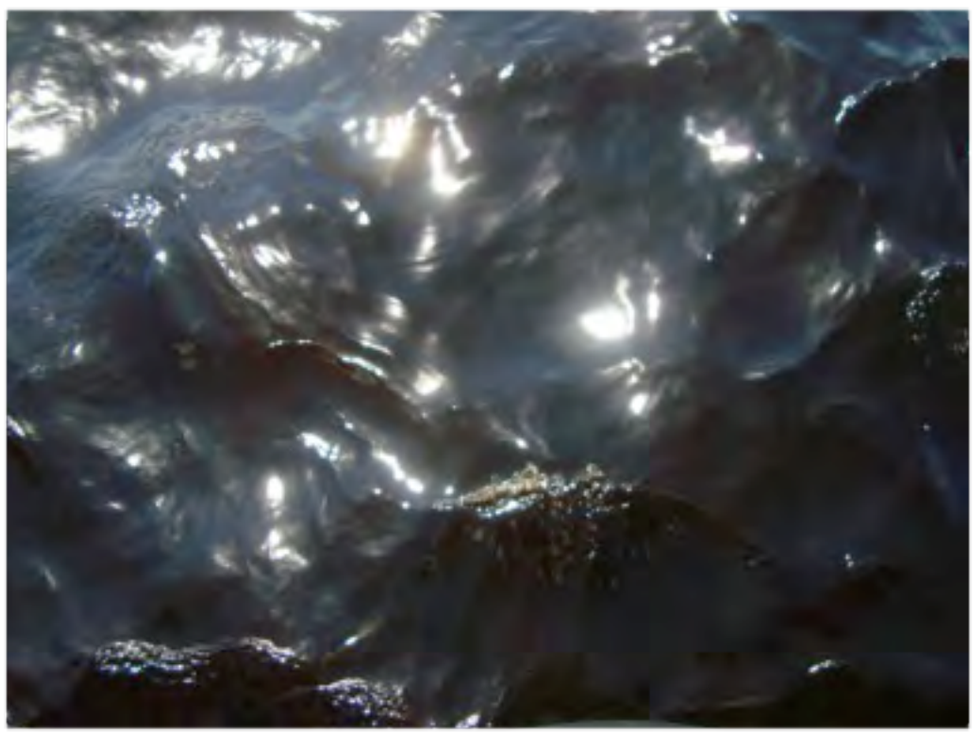
- Plan for the challenges of a prolonged discharge.
  - During the DWH event we encountered oil that was anywhere from 2 hours old to 2 months old, all in a single day.
  - These oils will react differently to dispersant application.
  - SMART needs to be able to address these variables.

-Two years ago I recommended we plan for the challenges of a prolonged discharge.

Document the weathered state of the oil.







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Planning

- Plan for the challenges of a prolonged discharge.
  - During the DWH event we encountered oil that was anywhere from 2 hours old to 2 months old, all in a single day.
  - These oils will react differently to dispersant application.
  - SMART needs to be able to address these variables.

Again, the lessons from the DWH response are not forgotten. We appreciate that the SMART teams may be called to evaluate crudes of varying degrees of weathering during a single response. I believe we have a clear understanding of this now and certainly have the capability to deal with it.

Preparation

- Have the right people and resources in a state of readiness.
  - At minimum, a SMART team should include:
    - Trained field technicians.
    - A trained aerial spotter.
    - A SMART data processing team.
    - A SMART Technical Specialist.

-Preparation, the second “P”.

Let’s start with resources. By this I mean the equipment necessary for a SMART response.

SMART Equipment

Turner Designs C-3 Fluorometer

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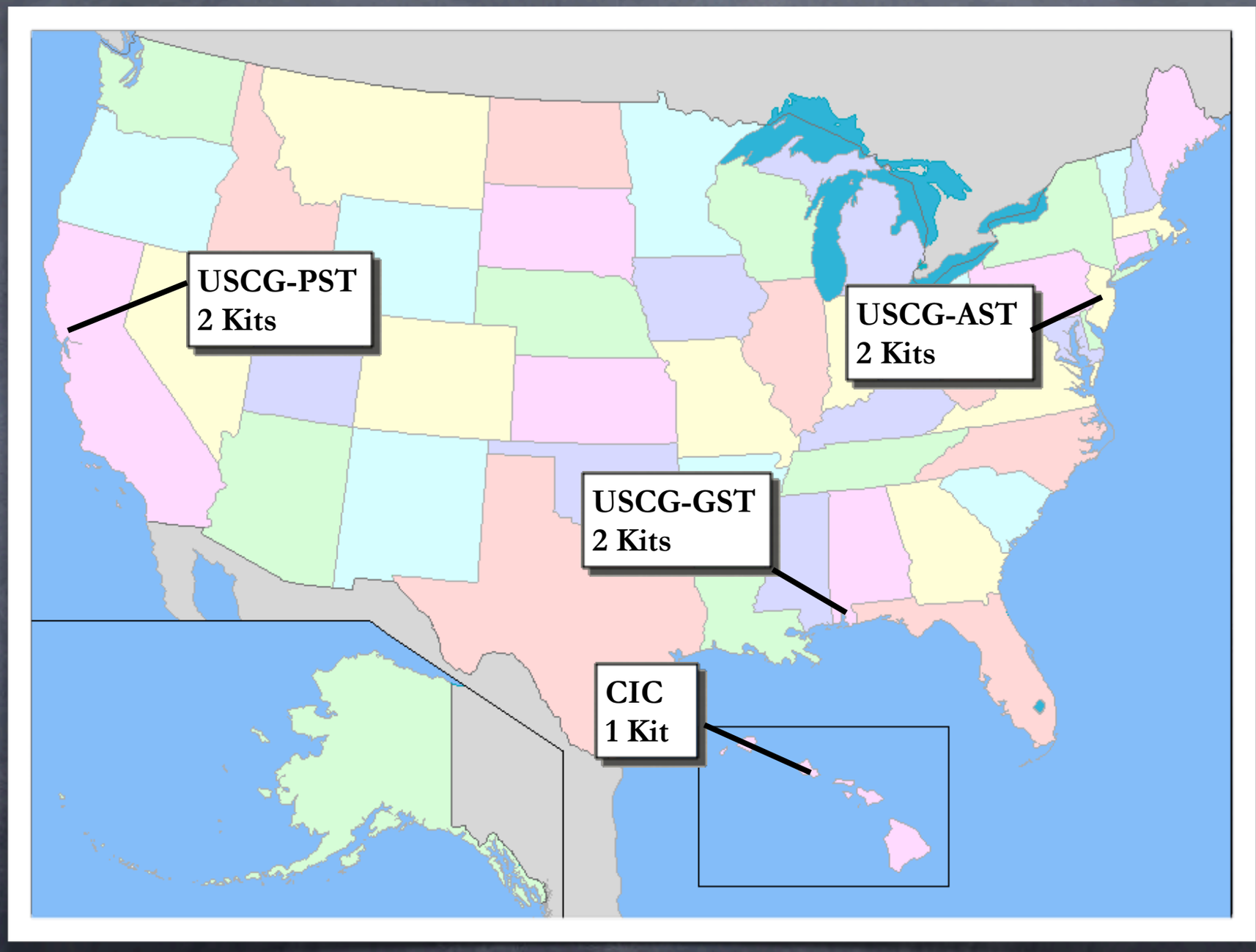
-In 2009 we introduced a new in-situ fluorometer into the SMART program.

-This new fluorometry package has performed well and has dramatically streamlined the field operations.

-At this point, I consider the C-3 fluorometer a suitable instrument for the SMART mission.

SMART Equipment Locations



Location of U.S. SMART equipment at the time of the DWH response.

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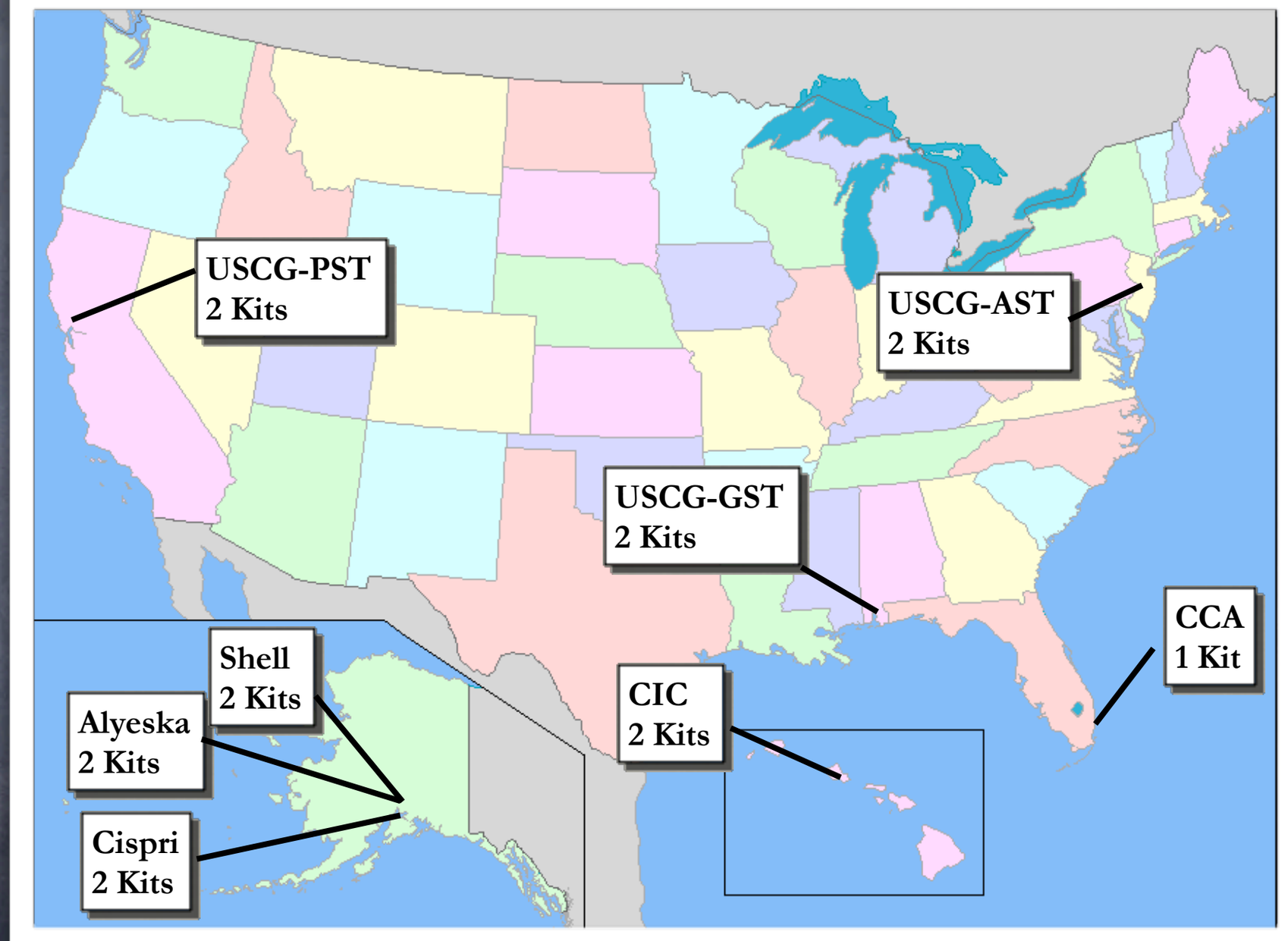
-At the time of the DWH response we had a total of 7 functioning SMART kits.

-All were put to use during the response and we could have used a few more.

SMART Equipment Locations



Current location of U.S. SMART equipment packages. 15 in total.

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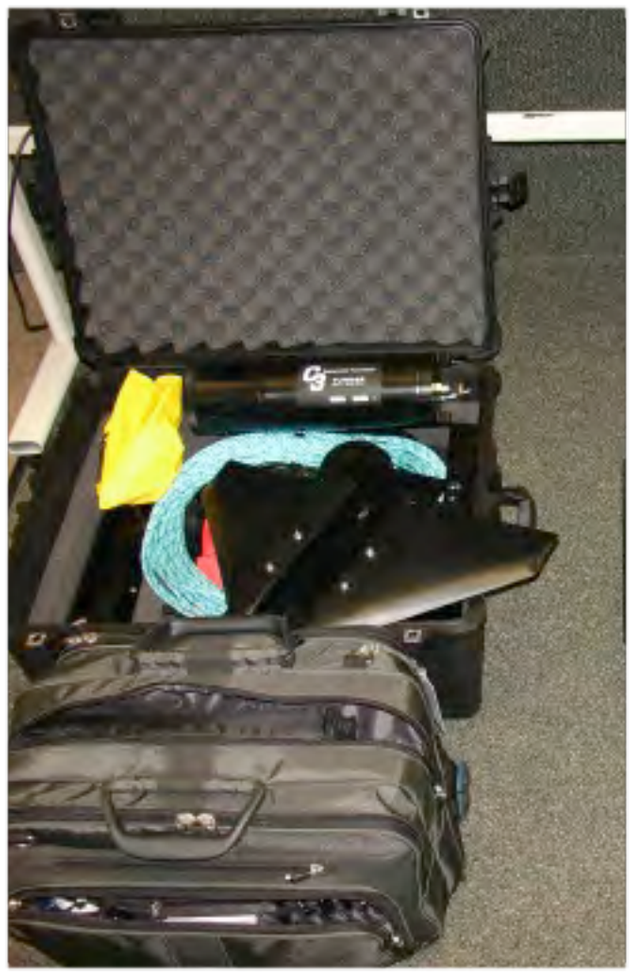
-We currently have a total of 15 SMART kits in the US.

-6 with the Strike Teams and 9 with Industry (and OSROs).

-I am very pleased to see Industry and the OSROs stepping up to the plate with SMART equipment.

SMART Equipment Consistency



We strive to keep the SMART kits uniform to provide for interchangeability.

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-We've also done a good job maintaining the consistency amongst the kits. All the domestic kits are similar enough so they are essentially interchangeable. Something important during a large scale response.

Preparation

- Have the right people and resources in a state of readiness.
  - At minimum, a SMART team should include:
    - Trained field technicians.
    - A trained aerial spotter.
    - A SMART data processing team.
    - A SMART Technical Specialist.

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-We've done a good job providing the equipment necessary for a comprehensive SMART response.

-Now, let's talk about personnel.

-We'll see how we're doing with each group listed here.

Trained Field Technicians

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-We just completed training the three USCG Strike Teams in 2012.

-With that, we have what I consider the bare minimum field capability.

-We have plans for more Industry training in Alaska for this summer.

-Training is critical.

-There is room for Industry to participate in this effort!

Preparation

- Have the right people and resources in a state of readiness.
  - At minimum, a SMART team should include:
    - Trained field technicians.
    - A trained aerial spotter.
    - A SMART data processing team.
    - A SMART Technical Specialist.

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-Overall, once we complete the training in Alaska this summer, we'll be in pretty good shape for SMART field technicians.

-Now let's look at the SMART Aerial Spotter...

SMART Spotting

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-The SMART Spotter choreographs the SMART process in the field.

-Spotting is a critical component of SMART.

Preparation

- Have the right people and resources in a state of readiness.
  - At minimum, a SMART team should include:
    - Trained field technicians.
    - A trained aerial spotter.
    - A SMART data processing team.
    - A SMART Technical Specialist.

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-I'll be blunt here, we do not have trained SMART spotters at this time.

-This is a gap in our program.

-We need to identify those tasked with this mission, develop the training curriculum, and get them trained.

-Now let's look at the SMART Data Processing Team...

SMART Data Processing

Appendix A

Example of a completed Fluorometer Operations Log.

FLUOROMETER OPERATIONS LOG

Case Name: **MODU DEEPWATER HORIZON** Date: 2010-07-13
SMART Team 4
Vessel Name: International Peace FPN:
FOSC:
SSC:

Weather Information

Wind: Light breeze	Swell: 2-3ft	Water: Green	Visibility: Slight haze
Seas: small wavelets, occasional breaking crest	Water Temp: 30ºC	Air Temp:	Sky: Blue, few alto-stratus clouds

Spill Information

Product Spilled: Gulf Crude	Quantity: Ongoing	Time: 0700hrs
Dispersant Used: Corexit 9500	Geographic Location (of sampling): see below	

Team Report

Comments should include: Presence or lack of surface oil or dispersed oil plume, whether conducting background run, transect in relation to slick, instrument or gear problem, or any other noteworthy event.

Time	Remarks
0700	97Y gets in touch with IP- our location is 28º40.42N 88º24.00W with skimming fleet. They will go look for oil.
0748	Found a dark brown slick 100mx100m in size at 28º30.80N 88º12.30W. On route now will take approx 1hour.
0837	98Y radios to say they are circling above the slick. Sight spotter-approx 1 mile away.
0844	Photos facing S/SSE. Visible oil is orange / brown colour and emulsified. Some sheen is present. Oil is very patchy and in wind rows.
0849	Approached thickest patch of oil. Oil is emulsified at edges and thick black/brown in middle. Becoming more continuous.
0900	Spray arms out and secure. Prepare for C3 use.
0923	Start up windmill. C3s in position at correct depth
0924	Start natural dispersion readings, stationary
0927	Photos facing SW. Close up and distance images of oil on the port side of vessel
0930	Photos of the LISST in operation on starboard (facing NNE). Thick orange / brown slick passes over LISST.
0944	LISST out
1000	Prep dispersant spraying equipment, pump and hoses

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1351	Start Background moving. Perfect depths
1352	10m C3 came up to 5 m but going back down. 1 knot boat speed, 0.8 knots – 8m, 1m. SOG 1.8 knots. 5m, 1m. 0.5 knots- 7m, 1m.
1401	Stop background moving
1407	1 mile from DC3 intended location for spraying
1455	OGG spotter is in comms. We are 1 mile to the east of slick
1504	DC3 flies overhead
1517	First aerial spray run
1539	Eleventh spray run. DC3 completed. Spotter gives us central coordinates for the spray runs: 28º26.51, 88º10.16
1543	Turn around and head for coordinates
1558	Reach position. Steam on the left hand limb turning port. Pictures facing SSE- tar balls, very broken and emulsified oil in water column. Not much oil on the waters surface.
1559	Lower C3s into water
1600	Start moving transects in area considered to be sprayed with chemical dispersant by DC3. Turn to port to follow slick. Good depths on both C3s. Photos facing S. Emulsified oil
1605	Thick black oil and emulsified orange colour at edges. 1 knot boat speed. Photo taken SSE. Depths good
1612	Turning to starboard along original track to starting point. Highest readings were taken there and so far readings have not peaked following port track.

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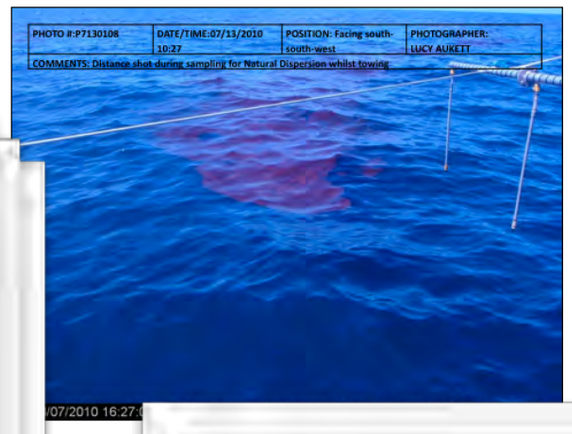
Appendix D

Example of a properly annotated SMART photo.



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Appendix C

Imill file properly converted to Excel format.

713_SMART_TEAM_4_BGA1.xls

am 4
number: 2003214
/V International Peace
ground at 1m

Logger
d at 13:25:52 Tue 13 Jul 2010
at 14:00:05 Tue 13 Jul 2010

	UTC	Oil (RFU)	Depth (m)	Temp (°C)	Latitude	Longitude
	182527	138.3	1.37	30.0	2828.142	8809.642
	182532	139.2	1.10	30.0	2828.142	8809.642
	182537	137.4	1.03	30.0	2828.141	8809.642
	182542	138.7	1.37	30.0	2828.14	8809.641
				30.0	2828.138	8809.641
				30.0	2828.137	8809.639
					2828.137	8809.639
					2828.137	8809.639
					2828.136	8809.638
					2828.136	8809.638
					2828.136	8809.638
					2828.135	8809.637
					2828.135	8809.637
					2828.134	8809.635
					2828.134	8809.635
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					2828.133	8809.634
					2828.133	8809.634
					2828.132	8809.634
					2828.132	8809.633
					2828.132	8809.633
					2828.131	8809.632
					2828.131	8809.632

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Appendix F

Example of a completed SMART Photo Log.

CASE: MODU DEEPWATER HORIZON, NSF 036-10

PHOTO#:	DATE/TIME:	TAKEN BY:	DIRECTION:
1	1026/10MAY10	DC2 HUNT	NW
POSITION: 28° 29.521 N 088° 07.460 W		**PHOTO DESCRIPTION:** LEADING EDGE OF THE SLICK THAT WE MONITORED.	
COMMENTS:			

PHOTO#:	DATE/TIME:	TAKEN BY:	DIRECTION:
2	1027/10MAY10	DC2 HUNT	NORTH
POSITION: 28° 29.582 N 088° 07.474 W		**PHOTO DESCRIPTION:** THIN OIL ALONG THE LEADING SLIGHTLY EMULSIFIED.	
COMMENTS:			

PHOTO#:	DATE/TIME:	TAKEN BY:	DIRECTION:
3	1027/10MAY10	DC2 HUNT	NW
POSITION: 28° 29.582 N 088° 07.474 W		**PHOTO DESCRIPTION:** DISPERSANT PLANE MAKING ITS SECOND RUN OVER THE OIL SLICK.	
COMMENTS:			

PHOTO#:	DATE/TIME:	TAKEN BY:	DIRECTION:
4	1051/10MAY10	DC2 HUNT	WEST
POSITION: 28° 29.50 N 088° 07.40 W		**PHOTO DESCRIPTION:** THE ONLY CLEAR ACTION OF THE DISPERSANTS THAT THE OIL SHOWED WAS ON THE OUTTER EDGES OF THE SLICK.	
COMMENTS:			

PHOTO#:	DATE/TIME:	TAKEN BY:	DIRECTION:
5	1122/10MAY10	DC2 HUNT	SE
POSITION: 28° 29.530N 088°07.40 W		**PHOTO DESCRIPTION:** THIS WAS THE FRESHEST OIL THAT WAS IN THIS AREA. THERE WAS NO CHANGES IN THE SURFACE OF THE OIL.	
COMMENTS: **THIS OIL HAD A STRONGER ODOR THAN MOST OF THE OIL IN THE LAST FEW DAYS. IT WAS SLIGHTLY EMULSIFIED IN SOME AREAS BUT APPEARED SOME WHAT FRESH FOR THE MOST PART. THERE WERE NO CHANGES IN THE AIR MONITORING EQUIPMENT.**			

Page 1 of 3

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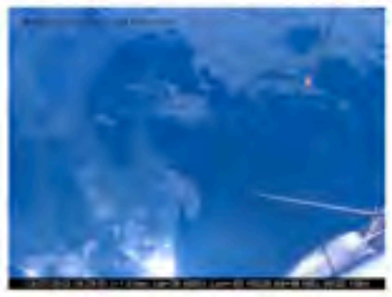
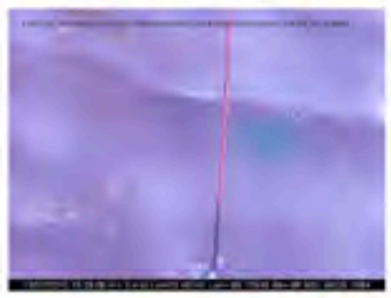
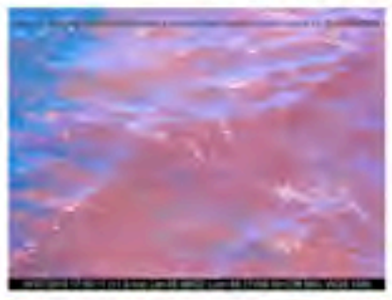
-The Smart Data Processor takes the pile of raw field data and converts it into a meaningful presentation.

SMART Data Processing

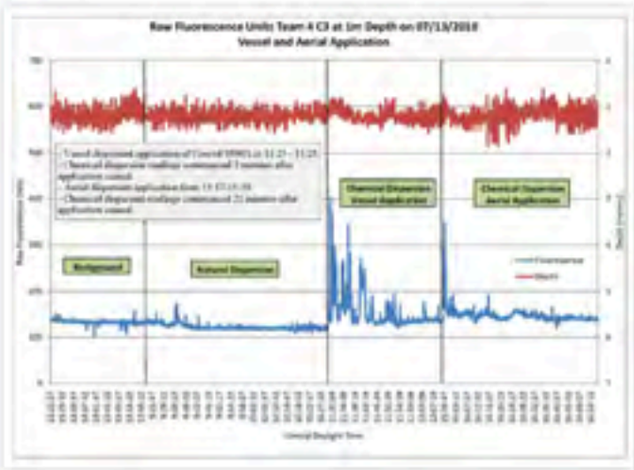
SMART Team 4 (IP) Dispersant Monitoring July 13, 2010

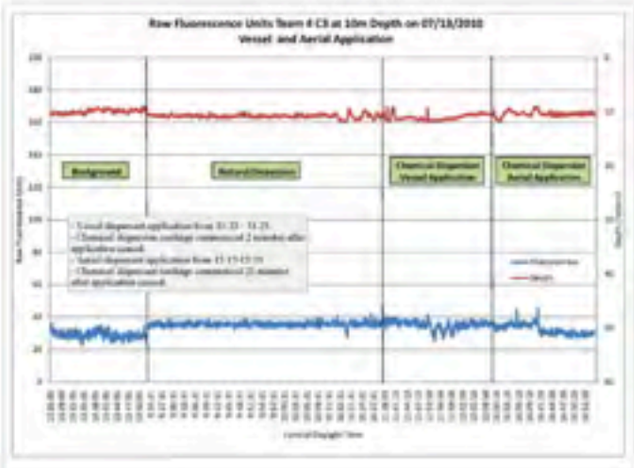






Results of a vessel and aerial dispersant application test to evaluate the efficacy of chemical dispersants on Mississippi Canyon 252 crude.





ASSESSMENT -
Based on the fluorometry data and visual observations, this dispersant application appears quite effective.

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-This is the current standard for SMART data presentation.

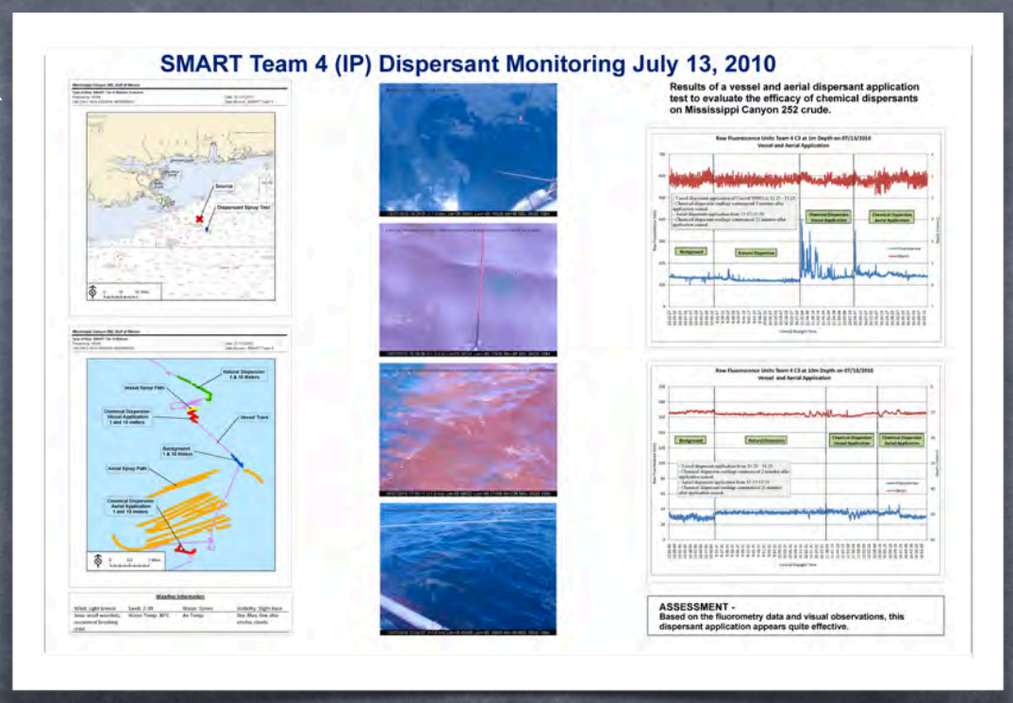
SMART Data Processing

Fluorometry Data

Tier 1 Photography

Sea State & Weather

Weathering State of the Oil



Test Location

Fluorometer Operator's Notes

SMART Spotter's Report

Vessel Position & Track

Spray Track

Spray Spotter's Report

Spray Parameters

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-SMART data processing is much more involved than I had originally suspected.

-The Smart Data Processor must evaluate all the information available, identify any inconsistencies, weigh the value of the information, and create a final evaluation.

-This requires a comprehensive knowledge of the SMART process.

Preparation

- Have the right people and resources in a state of readiness.
  - At minimum, a SMART team should include:
    - Trained field technicians.
    - A trained aerial spotter.
    - A SMART data processing team.
    - A SMART Technical Specialist.

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Again, I'll be blunt. At this point we do not have the personnel or training in place for SMART Data Processing.

Now let's look at the SMART Technical Specialist...

SMART Technical Specialist

-The SMART Technical Specialist is the person who can oversee and rope-in all the components of a SMART operation.

-The SMART Technical Specialist needs to have a comprehensive understanding of all aspects of the program and be able to troubleshoot any problems that arise. And problems always arise!

Preparation

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As with Spotting and Data Processing, we've yet to identify and train anyone for this role.

-Overall, we still have some gaps in the personnel necessary for a comprehensive SMART response.

-So, what can you do to help?.....

What can you do to help?

- Sponsor SMART training that is open to the broad response community.
- Provide opportunities for the SMART Teams to practice their skills.

-In order to work, SMART needs to be a Community-wide program.
-If your organization stands to benefit from SMART you need to participate in the process.
-What can you do to help?
	-Training
	-Practice
-Some organizations have already made considerable contributions to the SMART program....

Brian's SMART Hall of Fame

Clean Islands Council
- Equipment
- Program Development
- Training

Chevron Shipping
- Equipment
- Program Development
- Training

Tesoro
- Equipment
- Program Development
- Training

CISPRI
- Equipment
- Training

Alyeska
- Equipment
- Training

Shell
- Equipment

CCA
- Equipment

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-If your organization considers dispersants one of the tools in your toolbox and you're not on this list....

-We need to talk.

-We need to get you involved in SMART!