

# The *Deepwater Horizon*: Impact on Dispersant Use Policies

**James Staves**

**Environmental Protection Agency Region 6**



# Event on April 20, 2010



# Quantity of Oil Released

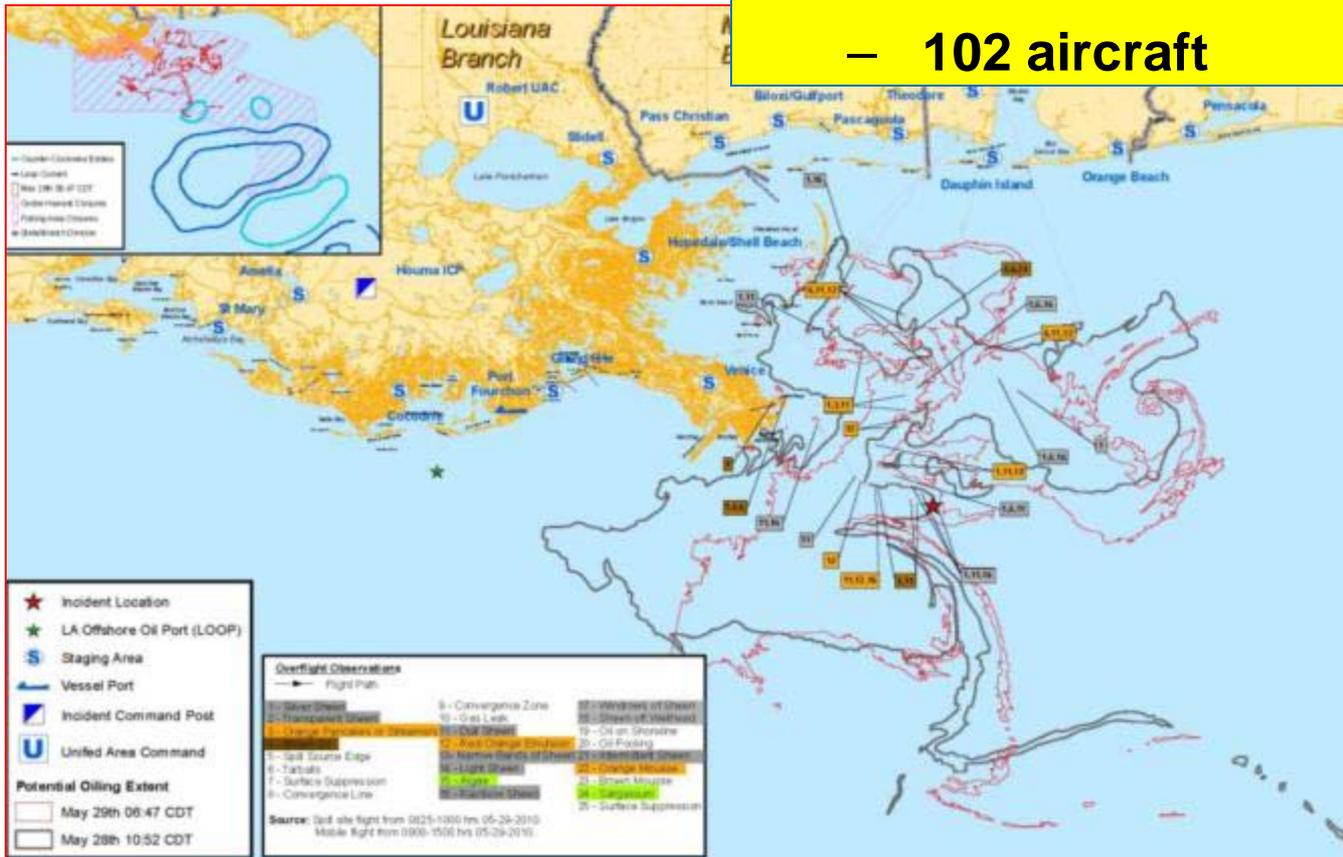
- 4.9 million barrels oil
- 205,800,000 gallons oil

First U.S Spill of National Significance (SONS)



# Snapshot of Response

- 47,849 personnel (maximum number)
- Vessels/Equipment in theater:
  - 6,050 offshore vessels
  - 835 skimmers
  - 102 aircraft



# Snapshot of Response

- Dispersants applied:
  - 976,237 gallons (aerial)
  - 96,277 gallons (surface)
  - 771,272 gallons (subsea)
- Total:
  - 1,843,786 gallons



# Unique Aspects of Environmental Response

- Unprecedented continuous deep sea oil discharge
- Unprecedented subsurface use of oil dispersants
- Unprecedented use of *in situ* burning
- Unprecedented geographic scope

# Summary of EPA Sampling / Monitoring Activities

(As of September 20)

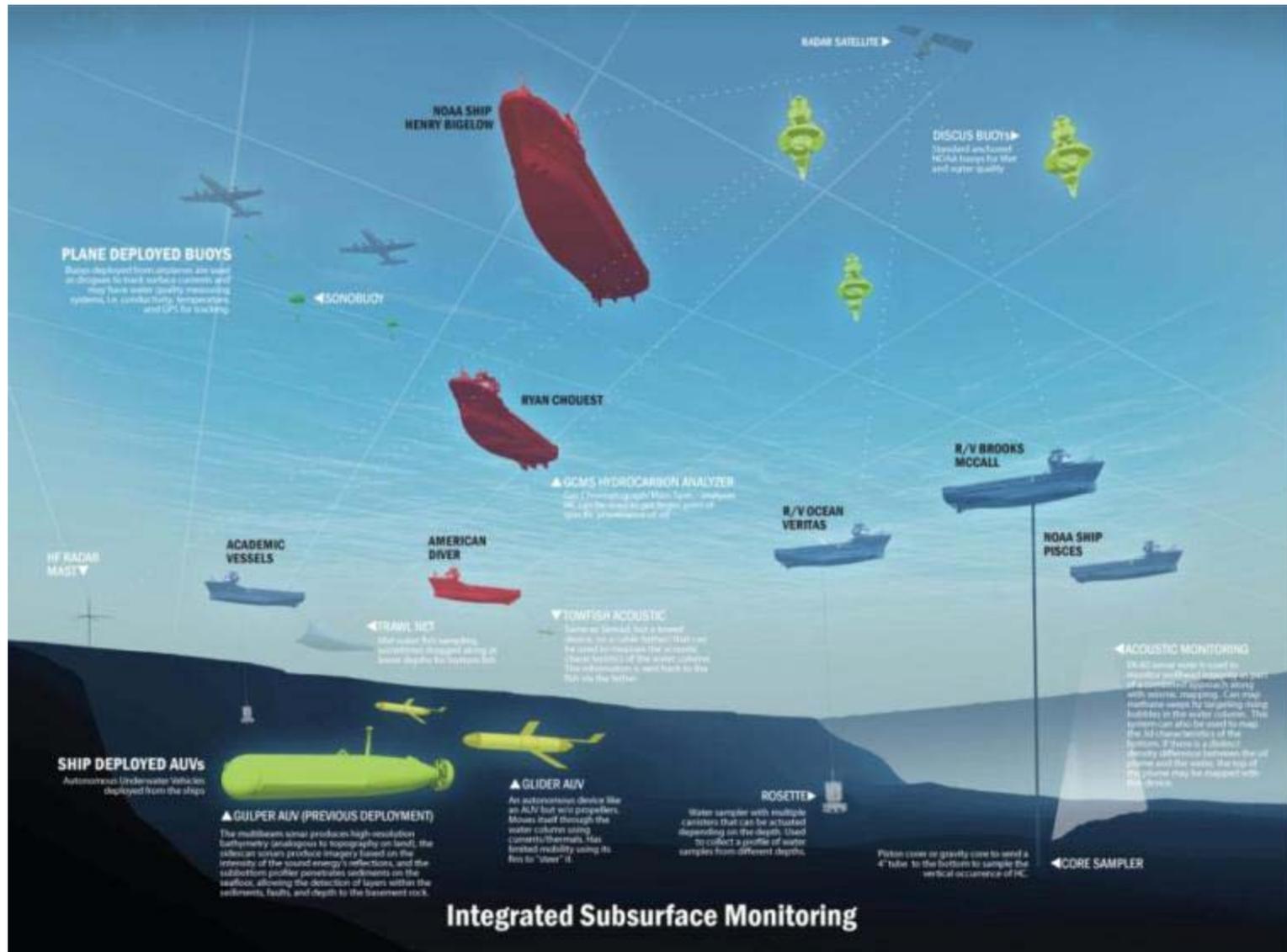


- **Over 3,600 water, air, and sediment samples collected**
  - **Water 1,107**
  - **Sediment 294**
  - **Oil / mousse 56**
  - **Waste 69**
  - **Air 2,224**
    - **All sample results posted to EPA website**

## **Environmental Monitoring and Sampling Effort**

<b>EPA</b>	<b>Air, Water, Sediment</b>
<b>BP (CTEH)</b>	<b>Air, Water, Sediment</b>
<b>NOAA</b>	<b>Water</b>
<b>USCG</b>	<b>Water</b>
<b>CDC</b>	<b>Air, Water, Sediment</b>
<b>OSHA</b>	<b>Air / Personal</b>
<b>USGS</b>	<b>Water</b>

# Sub-Surface Monitoring Unit (SMU)



# Goals

Determine the efficacy of dispersants injected directly into the oil from the riser

Determine the vertical and lateral extent of any Subsurface oil plumes encountered

Monitor for attainment of dissolved oxygen and toxicity “shut off” criteria

# *Deepwater Horizon*

## Subsurface Dispersant Monitoring

### Methods and Analytical Parameters:

- CTD probe results
- Dissolved Oxygen
- Rototox Toxicity
- TPH
- TPAH
- VOA
- LISST Particle analysis
- Dual Wavelength Fluorescence
- Microbial Analysis



# Summary of Effort for Subsurface Monitoring

- Over 25 open water vessels
- Over 125 dedicated cruises
- Over 900 days at sea
- Over 31,000 samples taken
- Multi-sector/agency effort
- Principal data types collected:
  - Chemistry
  - Sediments
  - Particles
  - Acoustics
  - Imagery



# *Deepwater Horizon*

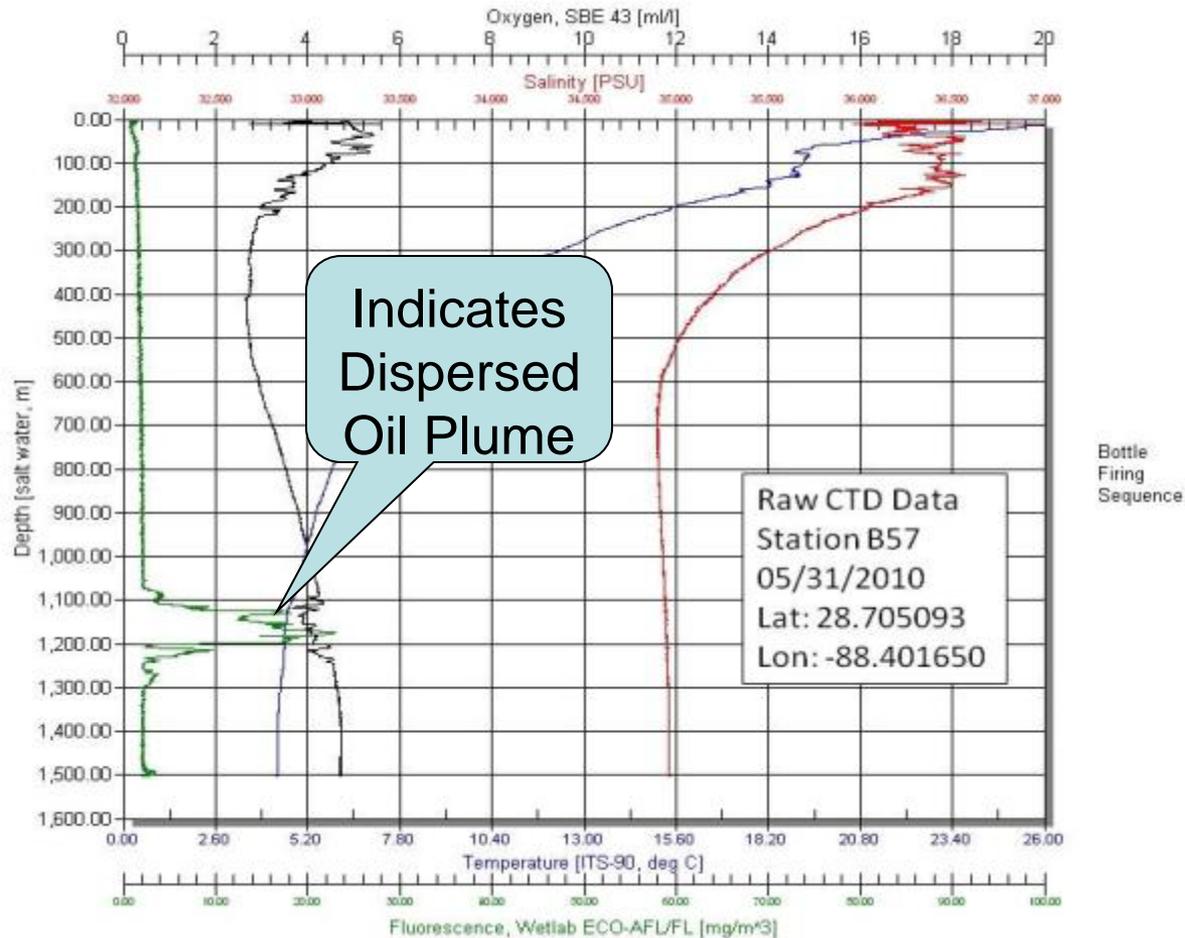
## Subsurface Dispersant Monitoring

Conductivity,  
Temperature,  
UV Fluorescence  
and Dissolved  
Oxygen (CTD)  
Probe on Rosette  
Sampler



# *Deepwater Horizon*

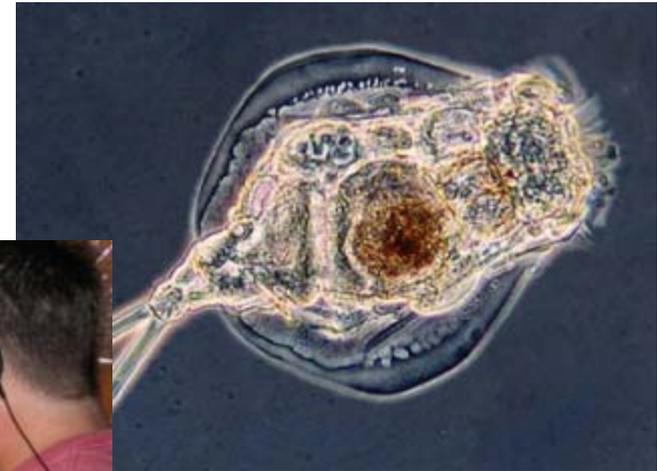
## Integrated Subsurface Dispersant Monitoring Program



# Deep Water Horizon

## Subsurface Dispersant Monitoring

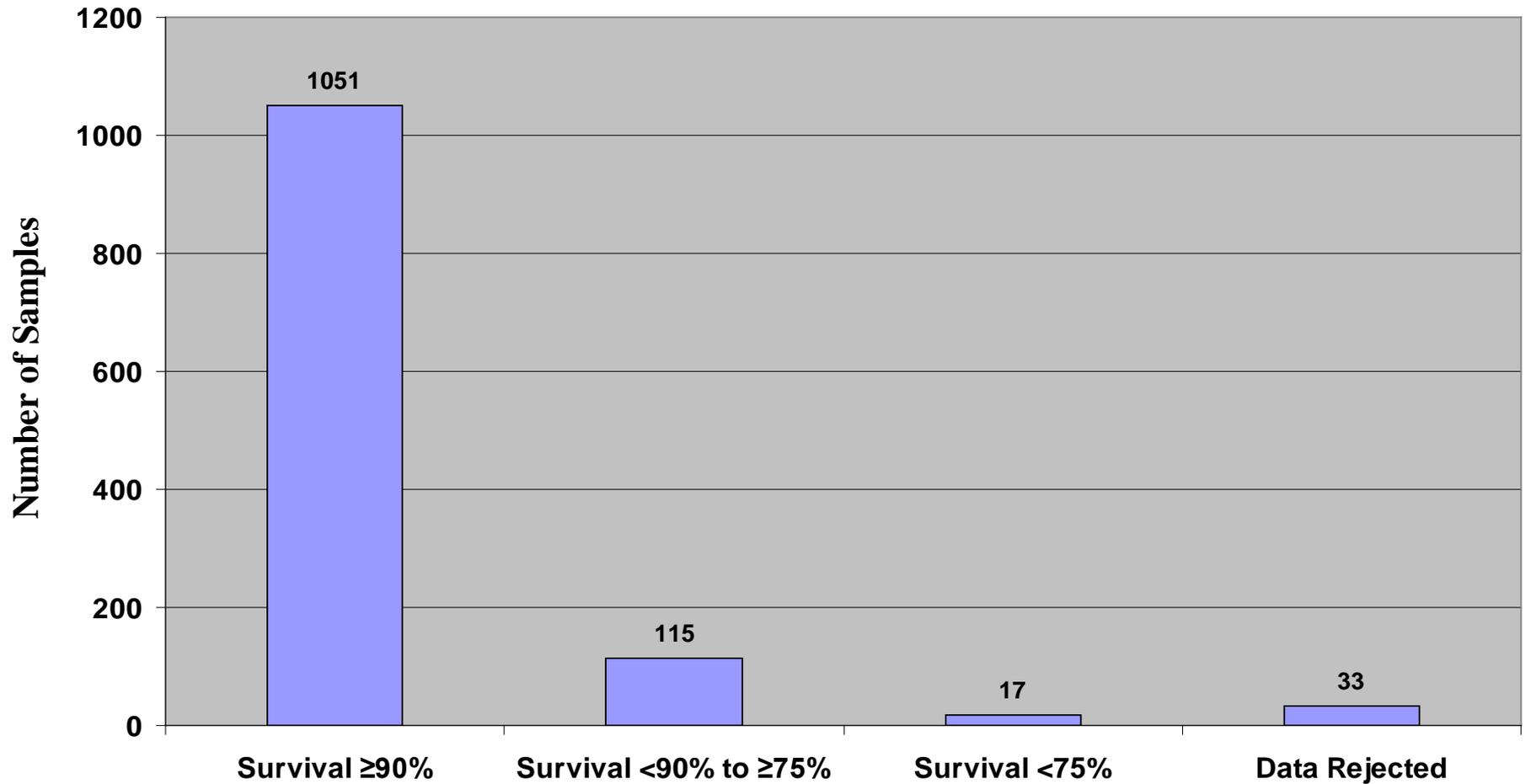
### Rototox Toxicity Test



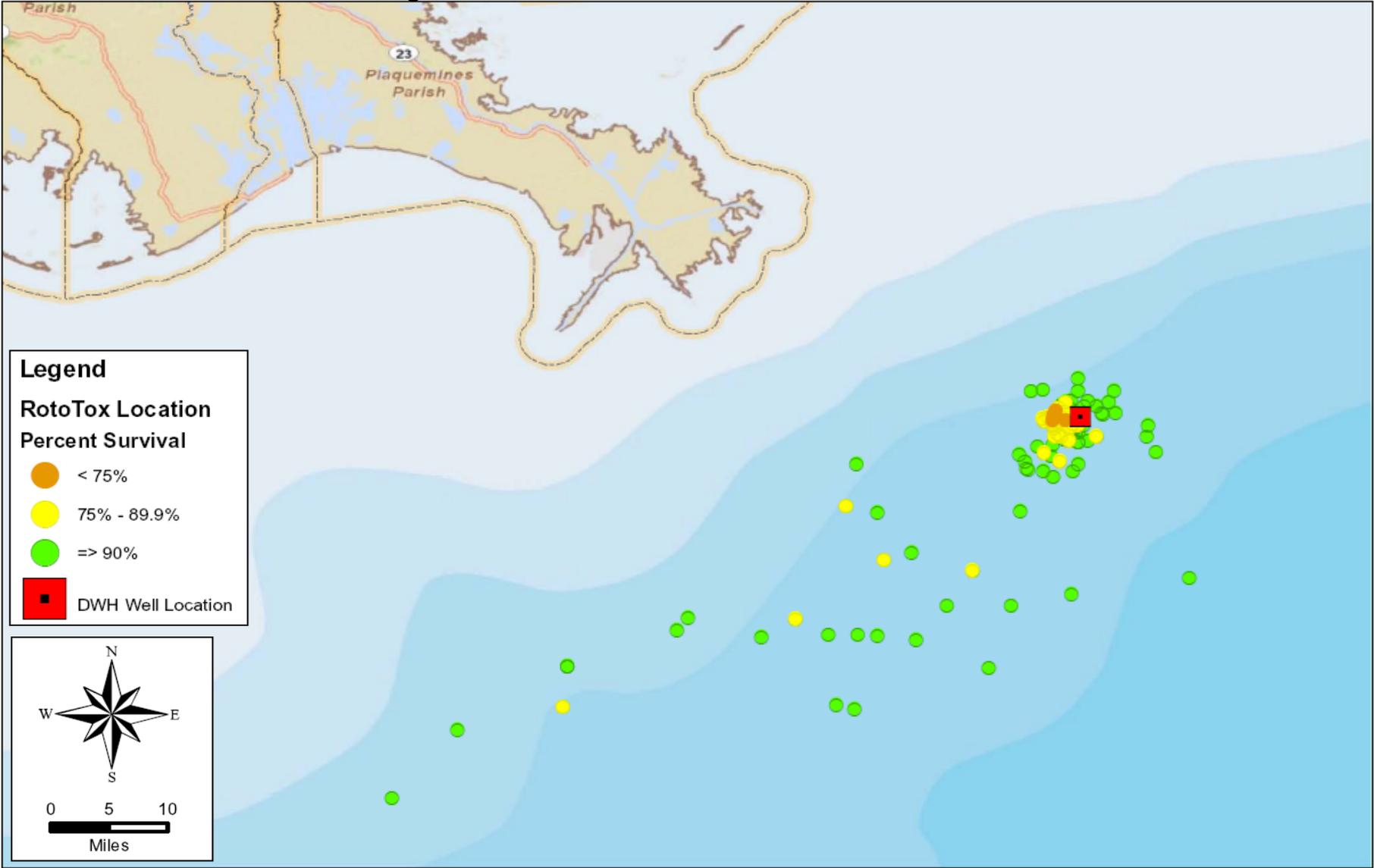
# Rotifer Toxicity Summary

- Rotifers are small aquatic organisms that are added to water sample treatments, and their survival over 24 hours is evaluated.
- Based on the ASTM method and performance standards for the rotifer test procedures, high survival (>90%) of control and sample treatments are classified as “not toxic.”
- For DWH water samples collected during the emergency response, 89% of the samples were not toxic.
- There were limited observations of toxicity across the samples:
  - 10% showed MARGINAL toxicity (survival range <90% to ≥75%)
  - 1% showed OVERT toxicity (survival <75%)

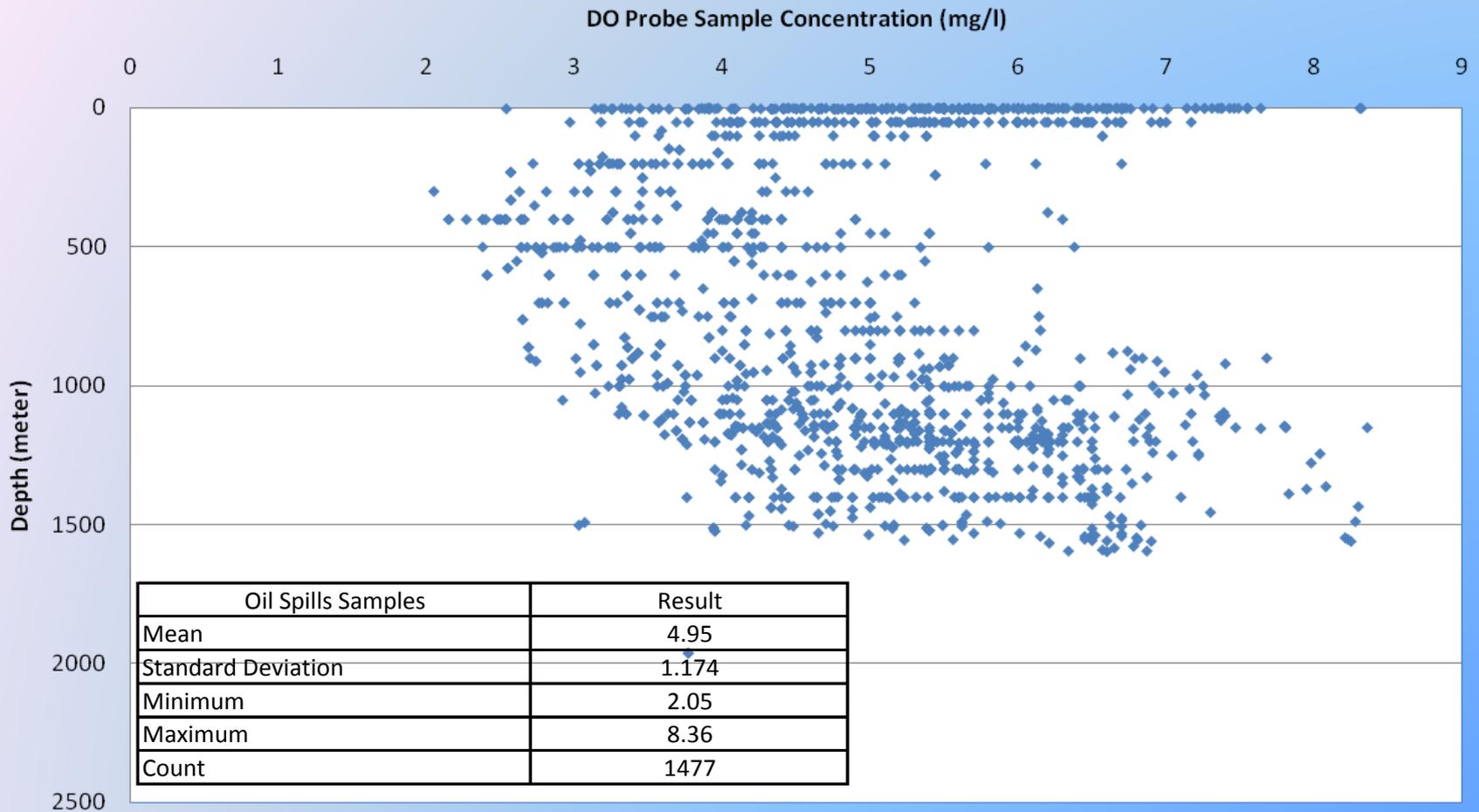
## Rotifer Toxicity Summary (May 29-Aug 26, 2010)



# Rotifer Toxicity Test Results Relative to Wellhead



# DO Probe Samples vs Depth (May 15, 2010 - July 10, 2010)



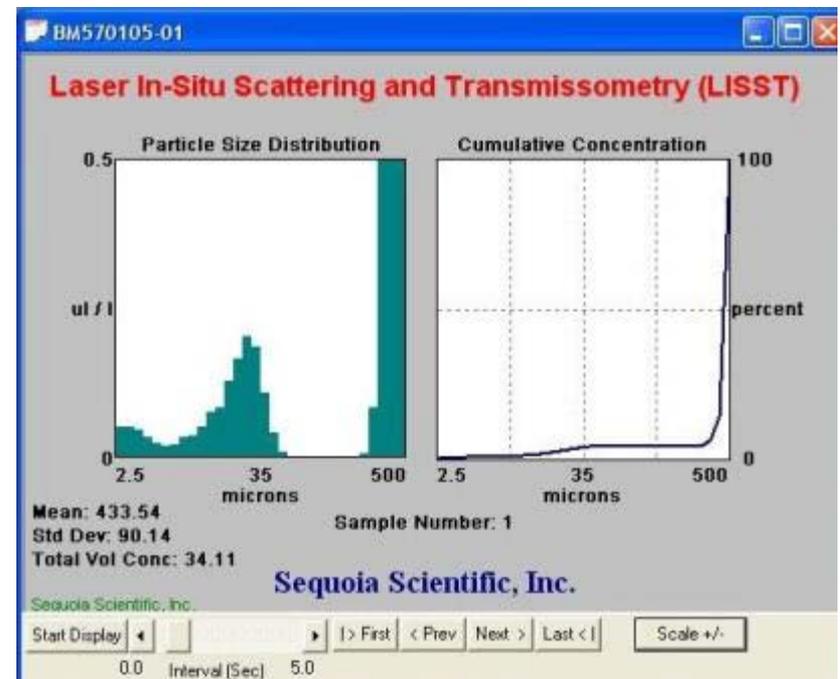
Data Source: Brooks-McCall & Ocean Veritas - May 15, 2010 – July 10, 2010

◆ DO Probe Sample

# *Deepwater Horizon*

## Subsurface Dispersant Monitoring Program

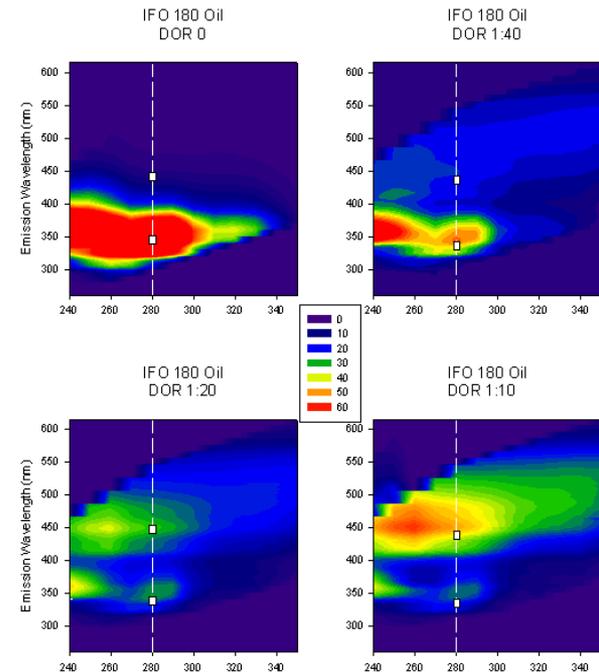
### LISST Particle Size Analysis:



# *Deepwater Horizon*

## Subsurface Dispersant Monitoring Program

### Fluorescence Intensity Ratio Analysis



# **Impact of DWH Response and Findings of the Subsurface Monitoring Unit on Dispersant Use Policies**

# **Pre-DWH**

## **Relevant Regulations, Plans, and Documents**

- NCP subpart J, Use of Dispersants and Other Chemicals
- Region 6 Interim Regional Integrated Contingency Plan, May 2010
- One Gulf Plan (ACP), 2010
- RRT 6 FOSC Dispersant Pre-Approval Guidelines and Checklist, version 4.0, 2001
- US DOI Section 7 consultation letter, January 5, 1995
- NOAA Section 7 consultation letter, September 8, 1994

# Specific Requirements Developed During the DWH Spill Response

- Dispersant Monitoring and Assessment Directive – May 9, 2010
  - Proof of concept
  - Characterization plan
  - Operational shutdown criteria
    - Dissolved oxygen below 2 ppm
    - Rototox toxicity deemed excessive by EPA and NOAA.
    - Note: Actual shutdown decision to be advised by RRT.

# Specific Requirements Developed During the DWH Spill Response (cont.)

- Dispersant Monitoring and Assessment Directive – Addendum 1, May 14, 2010
  - Continuous implementation of monitoring
  - EPA/NOAA scientist participation
  - LISST Particle Size Analysis
  - Daily data reporting
- Addenda 2 – 4
  - Dispersant alternatives / reduction
  - DO probe calibration via Winkler titrations

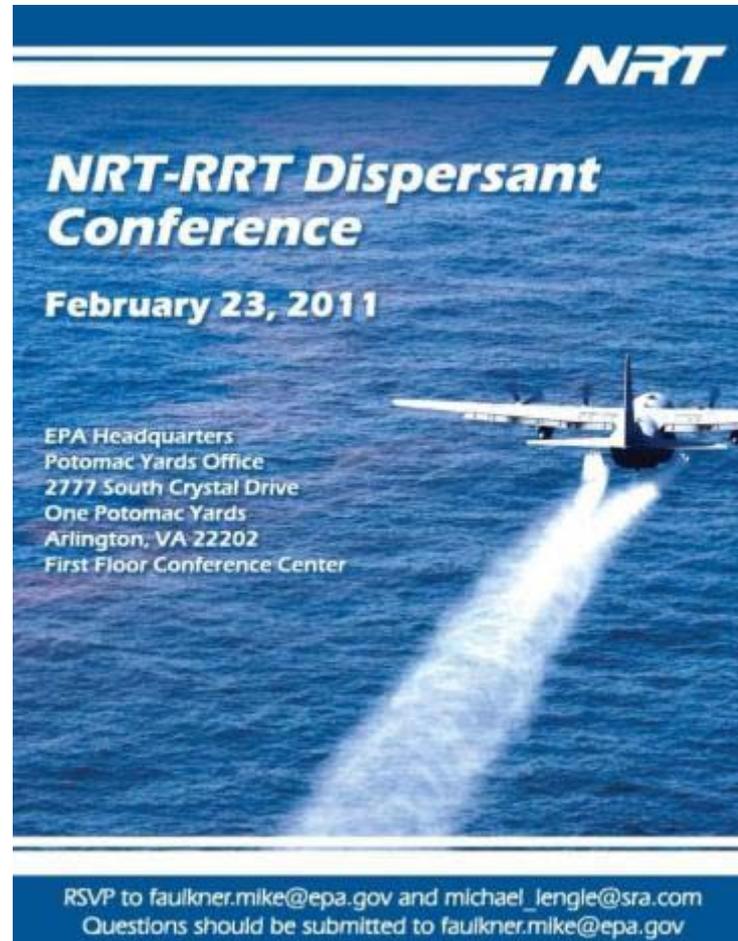
# **RRT6 Winter Meeting, December 2, 2020**

- Examination of Region 6 policies – post DWH
  - Review / Revise Dispersant Pre-authorization Plan – Preparedness Committee
  - Review / Revise Regional Contingency Plan – Response Committee
  - Develop Oily Waste Guidance – Science and Technology Committee

# **NRT Guidance to Regional Response Team Co-Chairs, December 16, 2010**

- When Revising RCPs and ACPs, Consider:
  - Hierarchies
  - Site-specific rationale
  - Limitations on pre-authorization
  - Subsea dispersants
  - SMART protocols
  - Transparency
  - Endangered species protection

# Next Steps in Policy Development

The poster features a blue background with a white and blue NRT logo at the top. Below the logo, the text 'NRT-RRR Dispersant Conference' is written in white, followed by the date 'February 23, 2011'. A photograph of a white aircraft flying over the ocean, releasing a large plume of white dispersant, is positioned on the right side. On the left side, the address for the EPA Headquarters Potomac Yards Office is listed. At the bottom, contact information for RSVP and questions is provided.

**NRT**

***NRT-RRR Dispersant  
Conference***

**February 23, 2011**

EPA Headquarters  
Potomac Yards Office  
2777 South Crystal Drive  
One Potomac Yards  
Arlington, VA 22202  
First Floor Conference Center

RSVP to [faulkner.mike@epa.gov](mailto:faulkner.mike@epa.gov) and [michael\\_jengle@sra.com](mailto:michael_jengle@sra.com)  
Questions should be submitted to [faulkner.mike@epa.gov](mailto:faulkner.mike@epa.gov)

# NRT Committee Actions

- NCP Subpart J Workgroup – will address dispersant listing requirements
- Subsea Dispersant Workgroup developed to:
  - Review DWH subsea dispersant monitoring and application practices
  - Define criteria for subsea dispersant use
  - Develop a checklist for subsea decision making
  - Identify scenarios/conditions where this oil spill countermeasure tool could be used

# Subsea Dispersant Workgroup Roles

- Coordinate guidelines for development of subsea dispersants under National Oil and Hazardous Substances Pollution Contingency Plan (NCP) Subpart J
- Address net environmental benefit and mitigation of health and safety concerns and
- Discuss the trigger for incident-specific ESA consultation when subsea dispersant use is proposed

# EPA Region 6 Interim Policy on Dispersant Use

- Subsurface dispersant may be approved for spills on an incident specific basis as requested by the FOSC. Incident specific monitoring shall be developed consistent with the DWH Subsurface Dispersant Directive and Addendum 1.

<http://www.epa.gov/bpspill/dispersants/subsurface-dispersant-directive-final.pdf>