



NOAA Spill Science Update

Jordan Stout

NOAA Scientific Support Coordinator

Office: (510) 437-5344

Cell: (206) 321-3320

24-hour Spill Line: (206) 526-4911

E-mail: jordan.stout@noaa.gov



NOAA Overview

(since the last Technology Workshop)

NOAA Supported Incidents (2015-present)

Advances in Observations

- ✓ Weather
- ✓ Currents & circulation models
- ✓ Oil

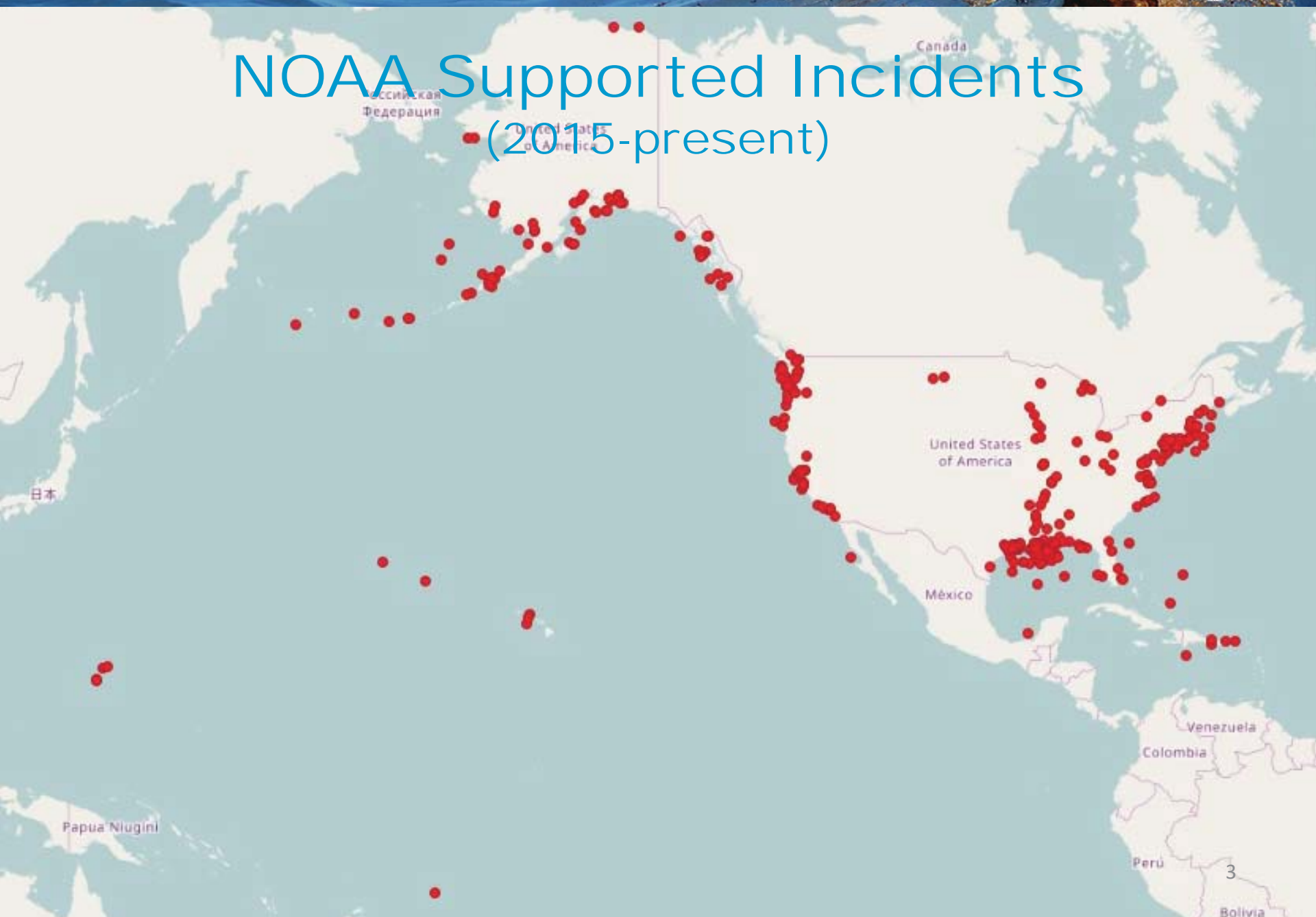
NOAA Spill Studies

- ✓ Dispersants, shoreline cleaners, photo-toxicity
- ✓ Ohmsett (w/BSEE)
- ✓ DWH NRDA

Trainings & Tools

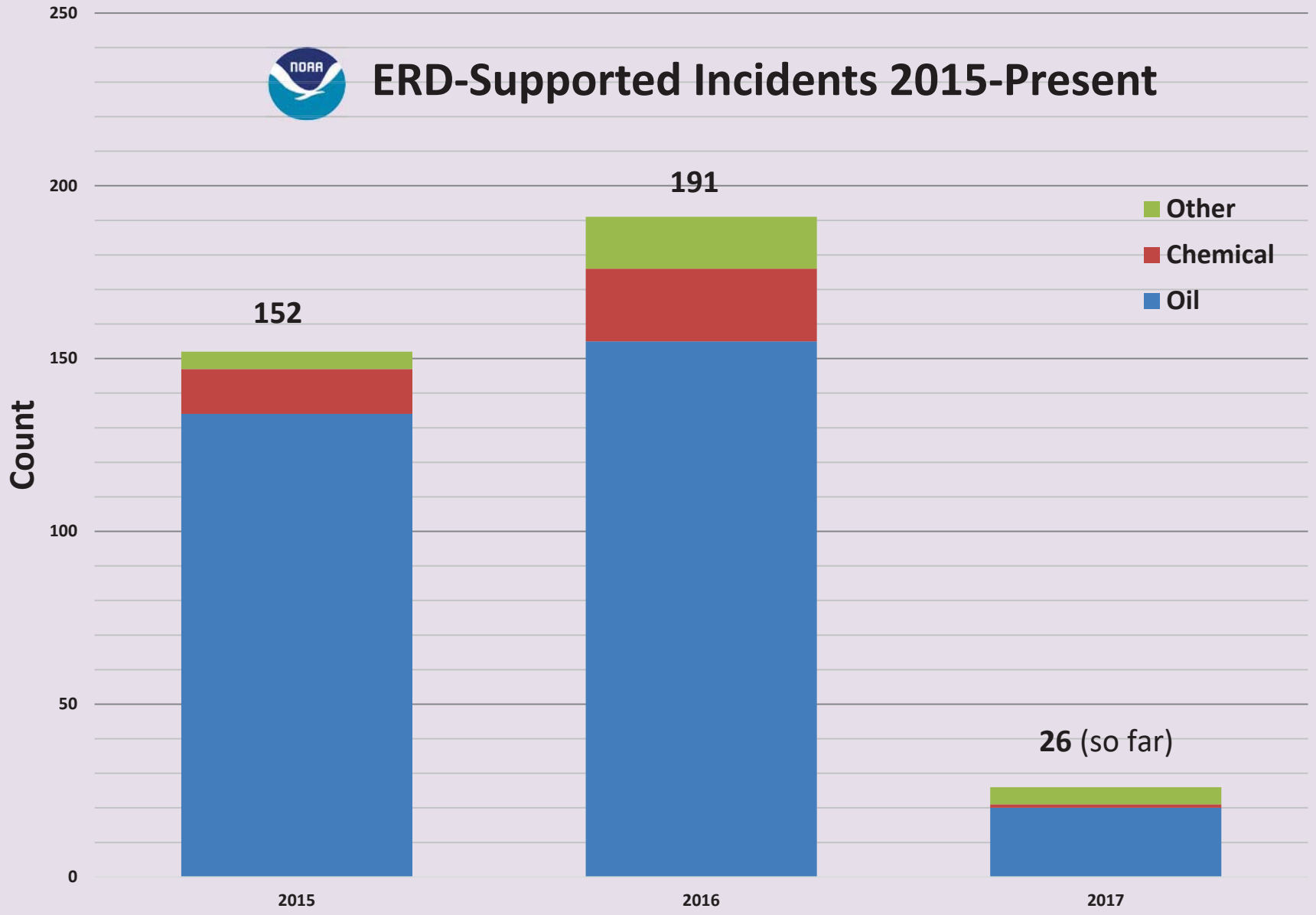


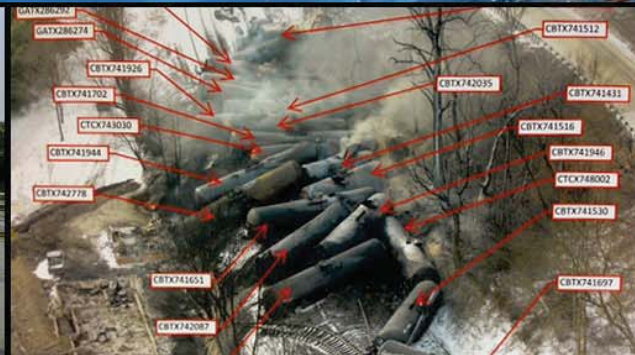
NOAA Supported Incidents (2015-present)





ERD-Supported Incidents 2015-Present

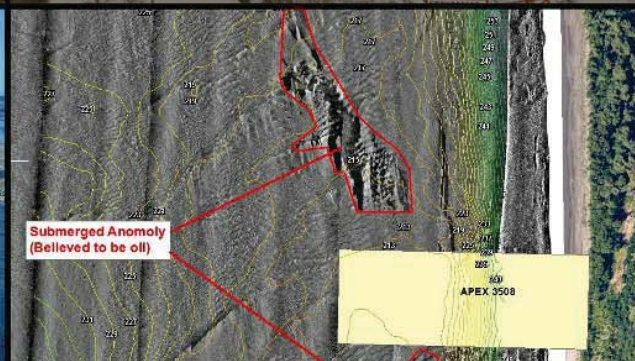




Sundarbans collision (09-DEC-2014): ~94,500 gallons heavy fuel spill, Bangladesh

CSX derailment (16-FEB-2015): 378,000 gallons Bakken crude, Mt Carbon WV

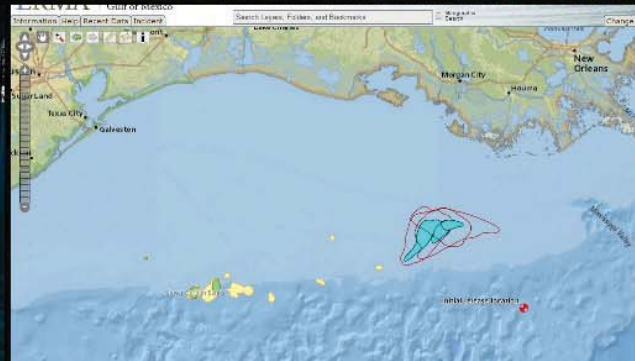
Morgan's Point Collision (09-MAR-2015): ~1.26 million gallons MTBE spill, Houston



Refugio pipeline spill (19-MAY-2015): ~123,000 gallon crude oil, Santa Barbara

Apex 3508 collision (03-SEP-2015): ~120,500 gallon slurry oil spill, Mississippi River MM937

Tank barge Argo (20-OCT-1937/16-SEP-2015): ~33,475 gallon crude oil/benzol spill, Lake Erie



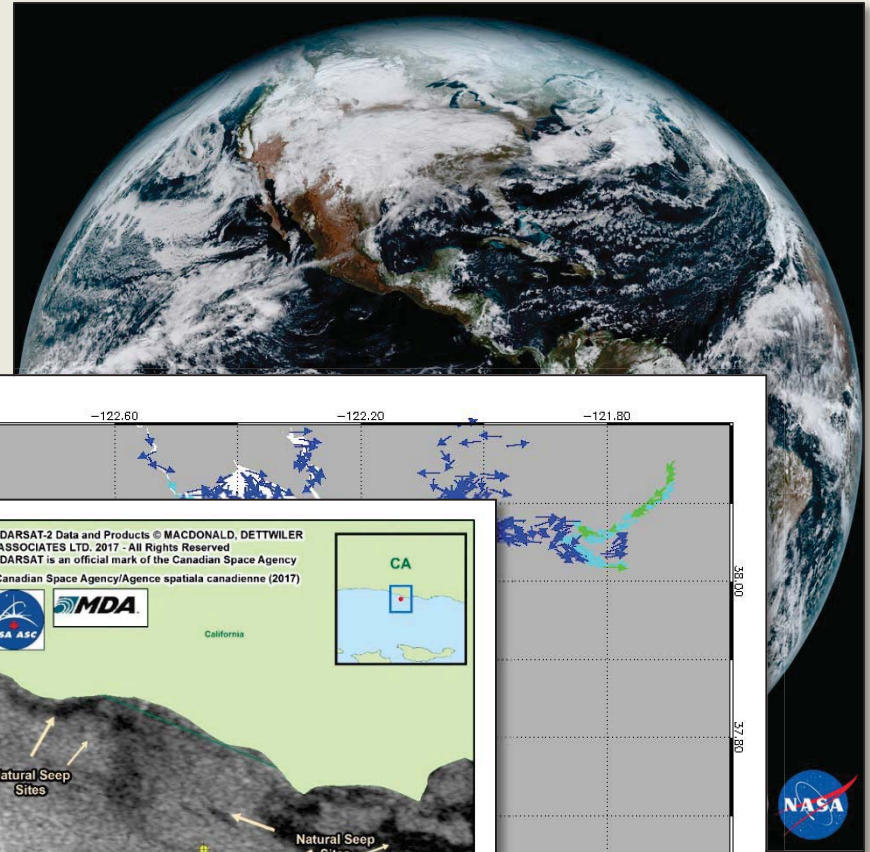
SF Bay Mystery Goo (16-JAN-2016): unknown quantity mystery goo, SF Bay

Green Canyon 248 well release (12-MAY-2016): ~88,200 gallon crude oil release, Gulf of Mexico

Spirit of Sacramento (04-SEP-2016): grounded & capsized paddle-wheeler/barge, Sac. River Delta



Advances in Observations



Weather

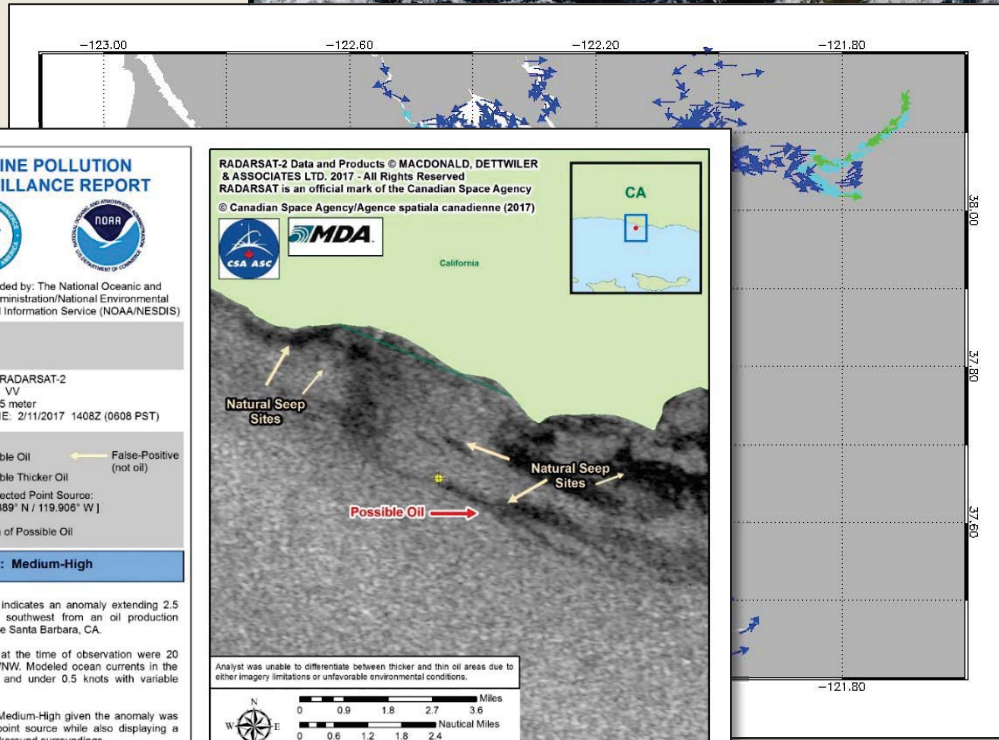
- ☑ Satellites (NWS)

Currents & Circulation Models

- ☑ SFBOFS
- ☑ HF radar / ROMS (UCLA)
- ☑ NOAA Pacific Model

Oil

- ☑ UAS
- ☑ Shoreline (SCAT)
- ☑ Satellites (NESDIS)



MARINE POLLUTION SURVEILLANCE REPORT

Analysis Provided by: The National Oceanic and Atmospheric Administration/National Environmental Satellite, Data and Information Service (NOAA/NESDIS)

REPORT DATE:
REPORT TIME:
ANALYST:

DATA SOURCE: RADARSAT-2
MODE: Standard VV
RESOLUTION: 25 meter
IMAGE DATE/TIME: 2/11/2017 1408Z (0608 PST)

Legend	
■	Possible Oil
■	Possible Thicker Oil
◀	False-Positive (not oil)
⊕	Suspected Point Source: [24.389° N / 119.906° W]
	1.5 km ² Area of Possible Oil

CONFIDENCE: Medium-High

REMARKS:
Satellite analysis indicates an anomaly extending 2.5 NM towards the southwest from an oil production facility just offshore Santa Barbara, CA.

Measured winds at the time of observation were 20 knots from the WNW. Modeled ocean currents in the area were weak and under 0.5 knots with variable directionality.

Confidence was Medium-High given the anomaly was connected to a point source while also displaying a contrast to its background surroundings.

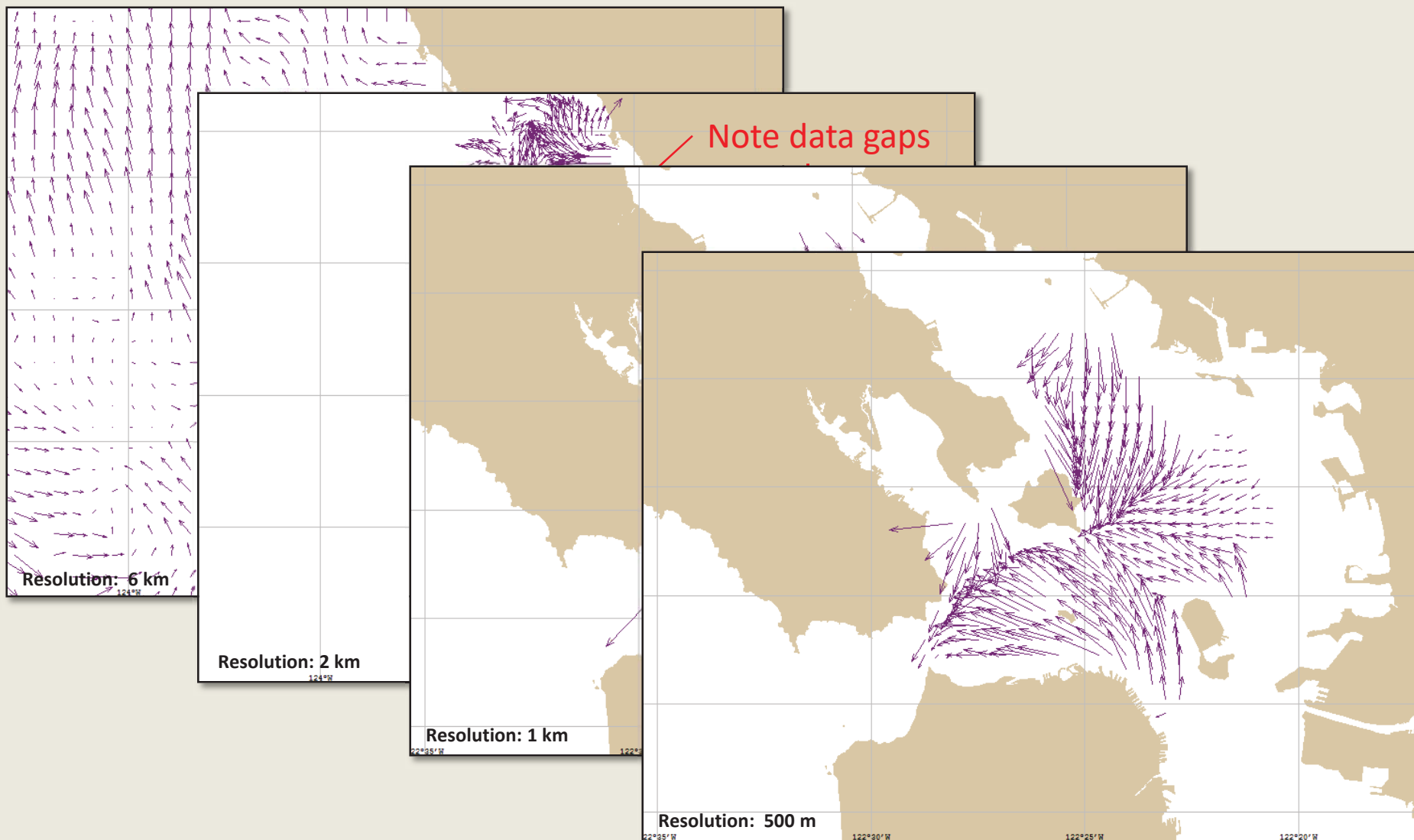
RADARSAT-2 Data and Products © MACDONALD, DETTWILER & ASSOCIATES LTD, 2017 - All Rights Reserved
RADARSAT is an official mark of the Canadian Space Agency © Canadian Space Agency/Agence spatiale canadienne (2017)

Analyst was unable to differentiate between thicker and thin oil areas due to either imagery limitations or unfavorable environmental conditions.

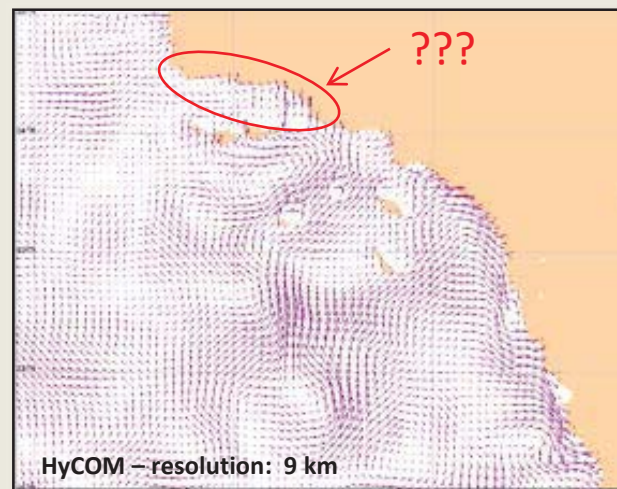
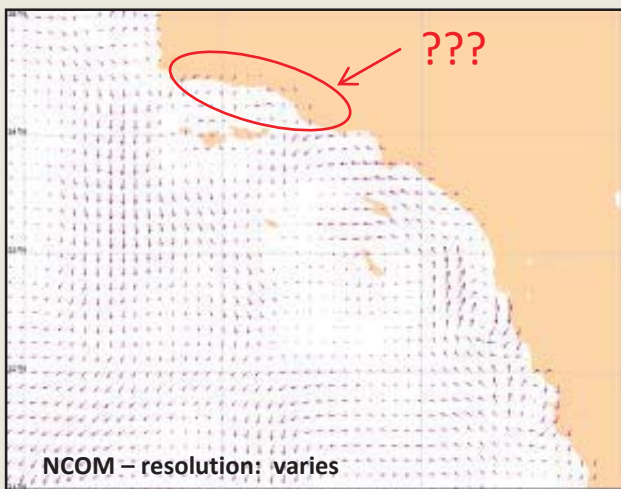
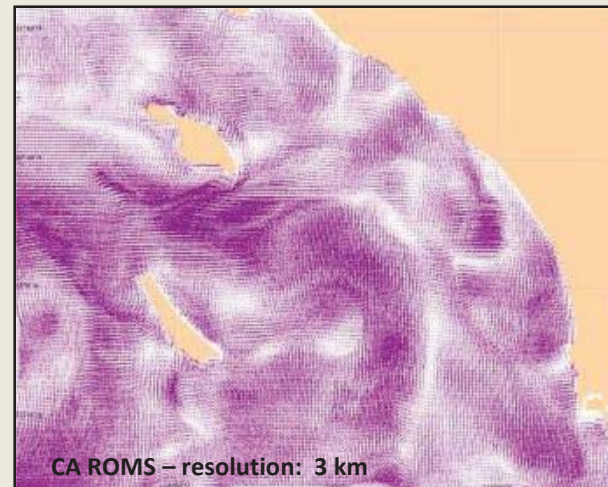
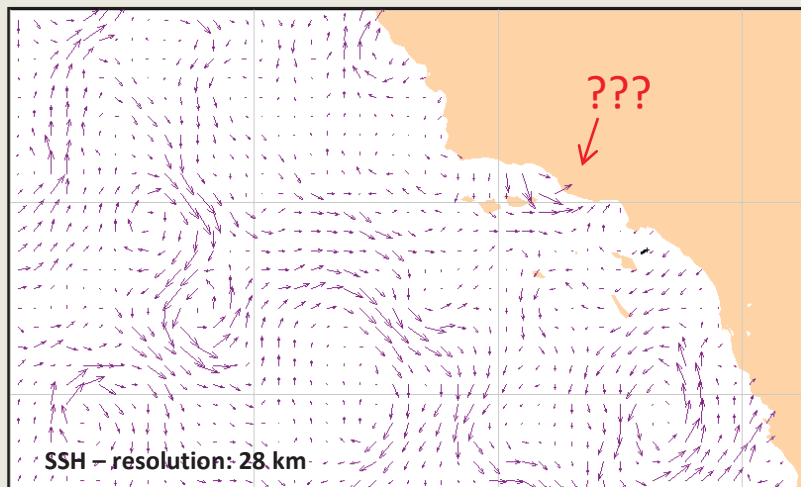
Miles: 0 0.9 1.8 2.7 3.6
Nautical Miles: 0 0.6 1.2 1.8 2.4
Kilometers: 0 1 2 3 4



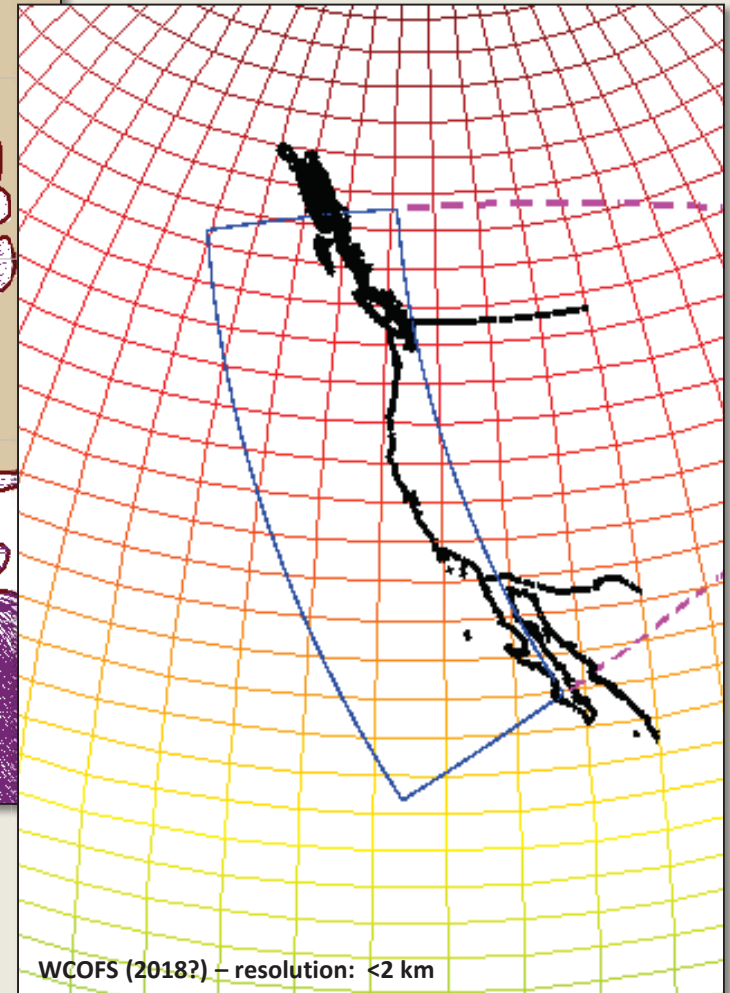
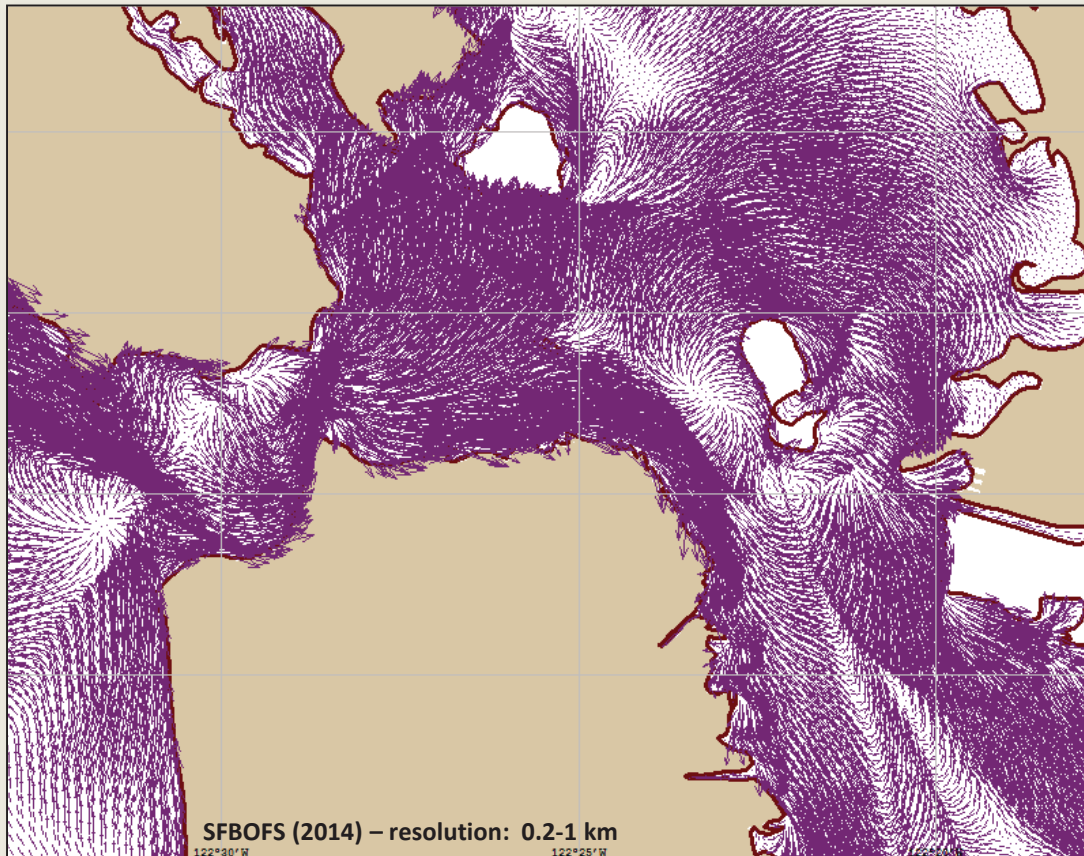
Coastal Circulation Obs (HF Radar)



Some Coastal Circulation Models



Emerging Circulation Models



Advances in Oil Observations

UAS

Shoreline (SCAT)

Satellites (NESDIS)





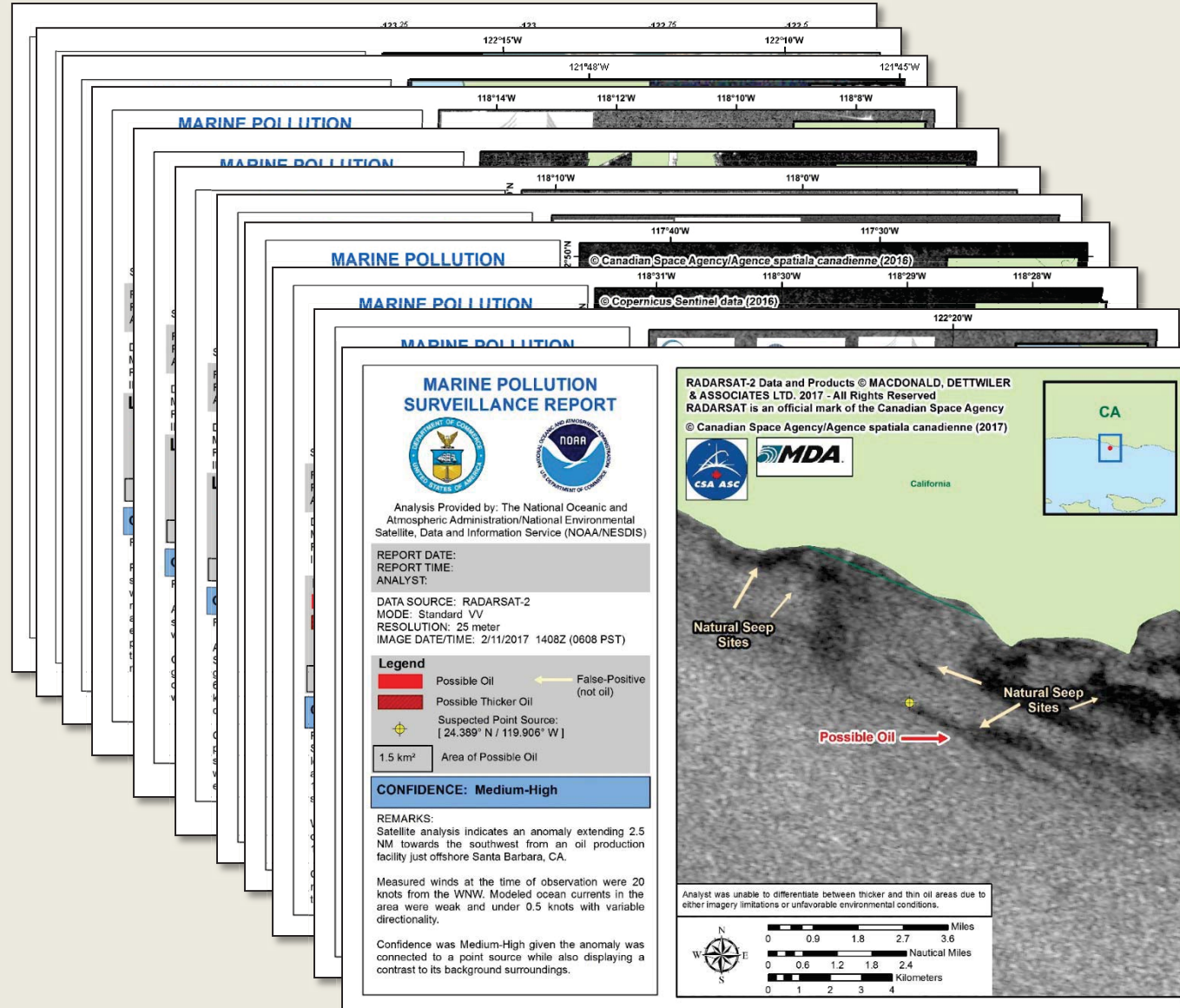
NESDIS Reports in CA

Experimental

- 29-JAN-2010
- 23-SEP-2010

Operational

- 05-MAR-2012
- 08-APR-2015
- 17-OCT-2015
- 22-JAN-2016
- 08-MAY-2016
- 27-MAY-2016
- 16-DEC-2016
- 07-JAN-2017
- 11-FEB-2017





NOAA Spill Studies

NCCOS wetland mesocosm studies

- ✔ Dispersants
- ✔ Shoreline cleaners
- ✔ Photo-enhanced toxicity

Ohmsett (w/BSEE)

- ✔ Dispersants & baleen
- ✔ Remote sensing of oil emulsions

Deepwater Horizon (MC-252) NRDA

- ✔ PDARP/PEIS & publicly available info/data
- ✔ Informing future responses

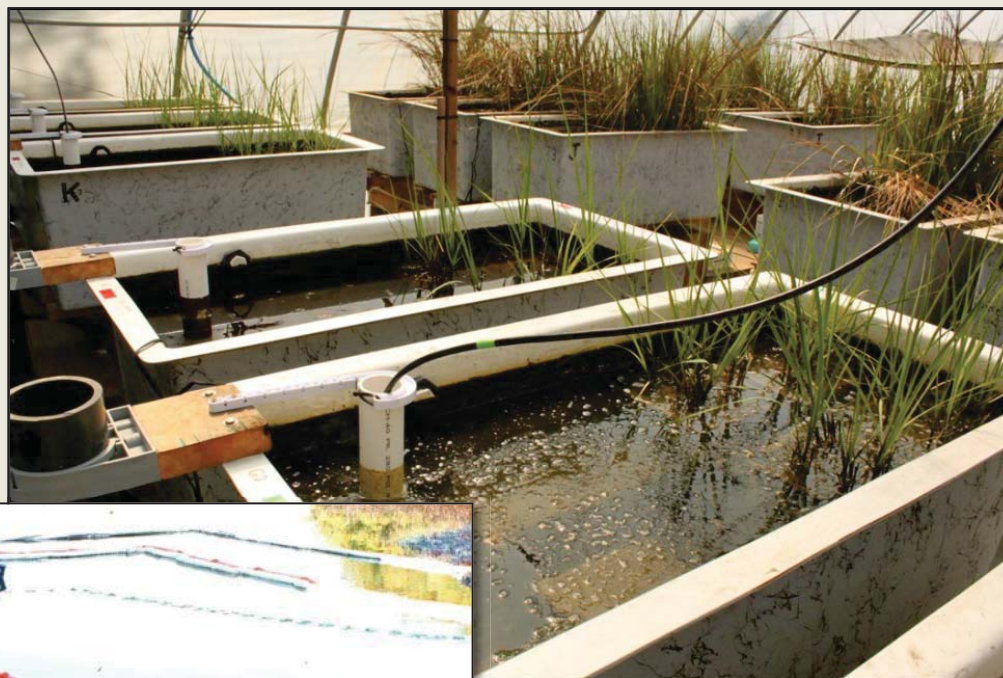
NCCOS Wetland Mescocosms

Dispersants

Shoreline cleaners

Bioremediants

Photo-enhanced toxicity



Julie N spill, Portland, ME (1996)

NOAA Ohmsett Studies (w/BSEE)

Dispersants & baleen

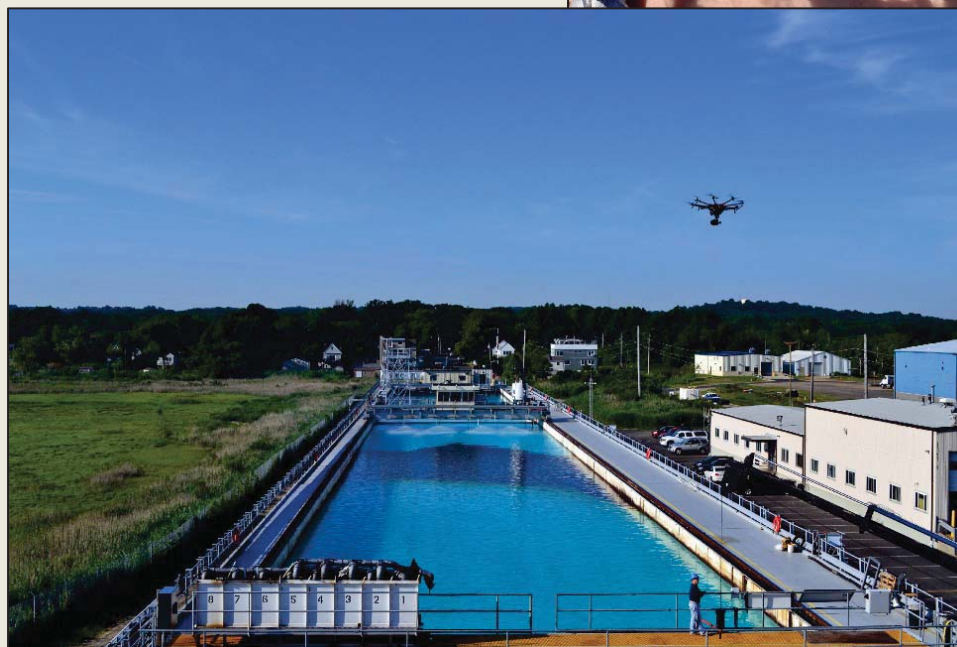
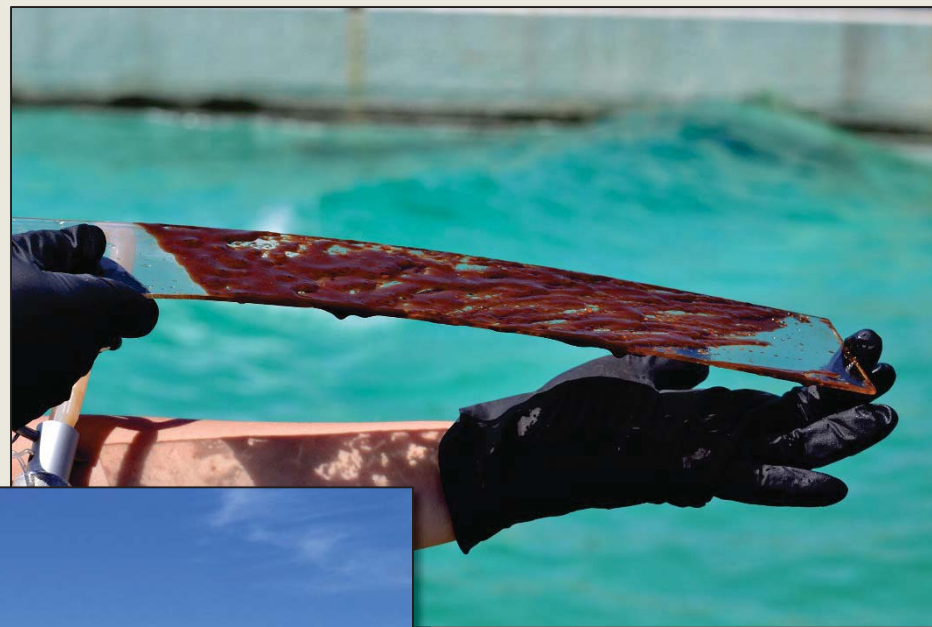
Remote sensing of oil emulsions



NOAA Ohmsett Studies (w/BSEE)

Dispersants & baleen

Remote sensing of oil emulsions





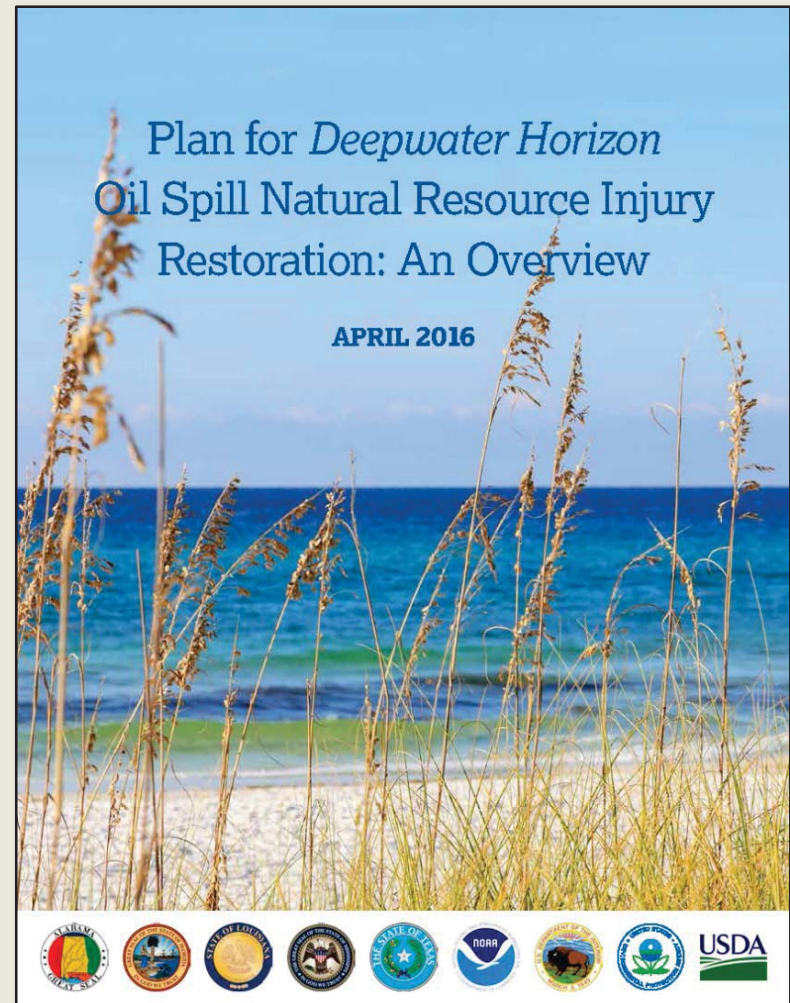
DWH NRDA

**PDARP/PEIS & publicly
available info/data**

“Big Data” tools

New science questions

Informing future responses



NRDA data available at: <https://www.diver.orr.noaa.gov>



NOAA Trainings & Tools

Trainings

- ✓ Aerial observer (On-line)
- ✓ SCAT
- ✓ SOS
- ✓ SOCR

Oil, Hazmat & Toxicology Tools

- ✓ ADIOS
- ✓ GNOME / GOODS
- ✓ TAP
- ✓ CAMEO suite
- ✓ CAFÉ



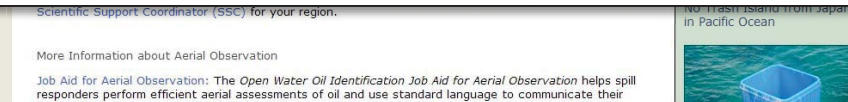
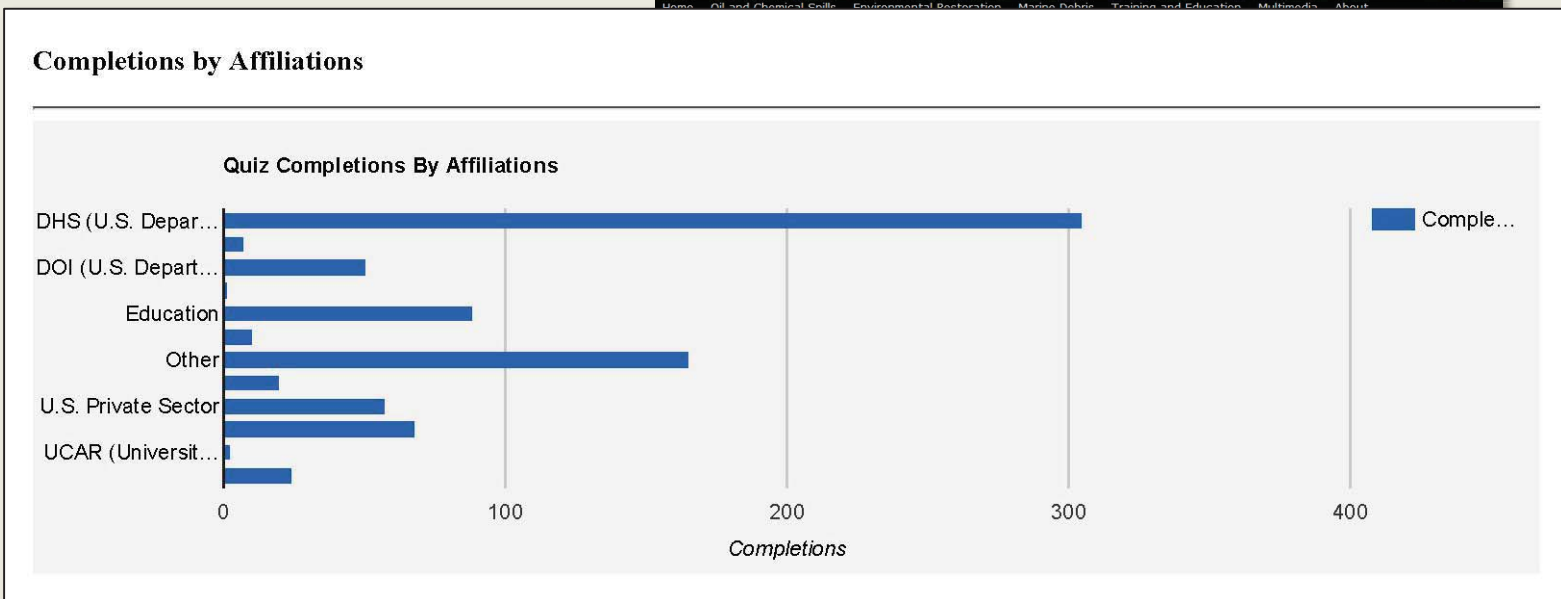
NOAA Trainings

Aerial observer (on-line)

SCAT

SOS

SOCR



Available at: <http://response.restoration.noaa.gov>

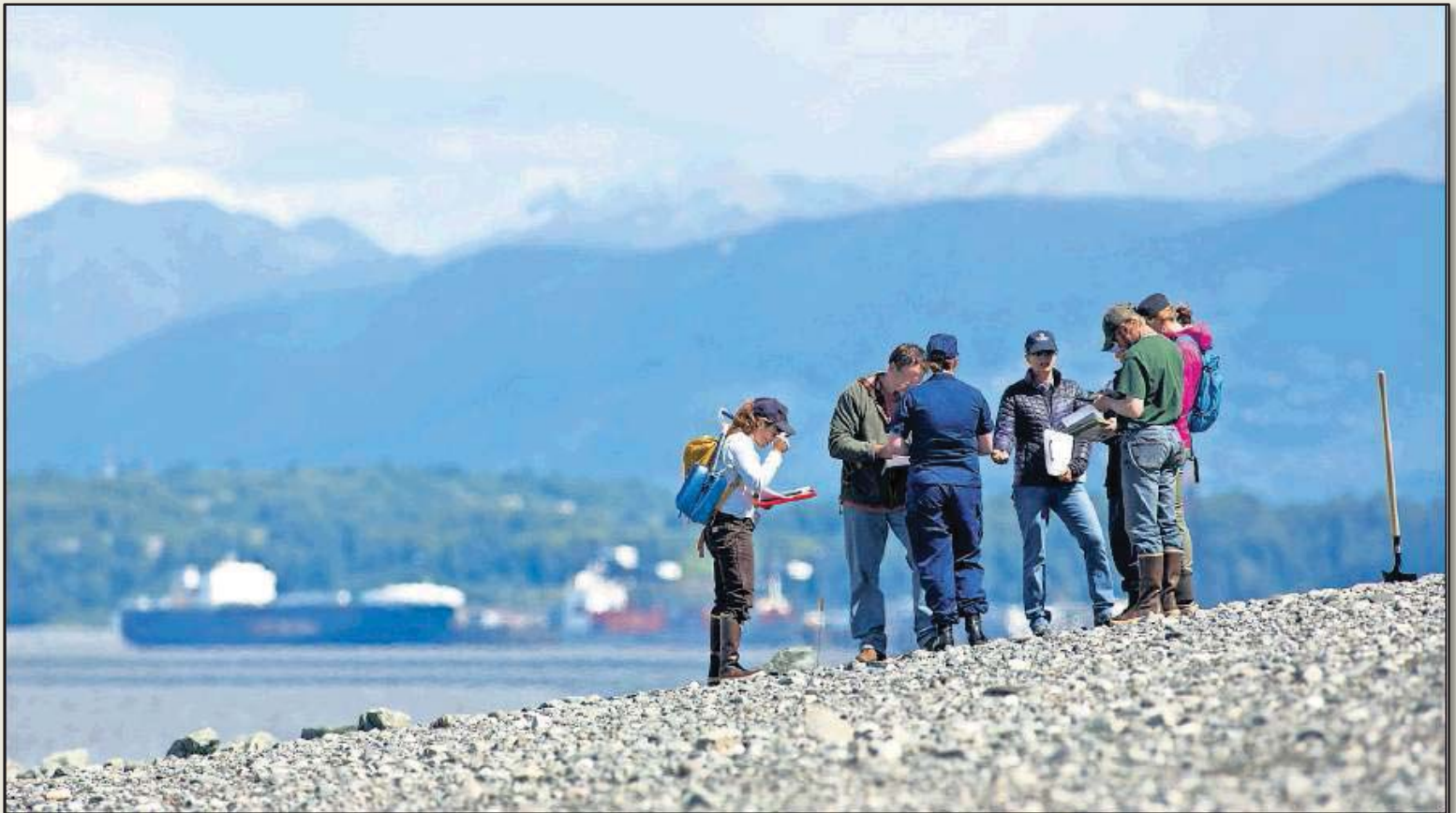
NOAA Trainings

Aerial observer (on-line)

SCAT

SOS

SOCR



NOAA Trainings

Aerial observer (on-line)

SCAT

SOS (Science of Spills)

SOCR



NOAA Trainings

Aerial observer (on-line)

SCAT

SOS

**SOCR (Science of
Chemical Releases)**





NOAA Oil, Hazmat & Tox Tools

ADIOS

GNOME / GOODS

ROC (Response Options Calculator)

TAP (Trajectory Analysis Planner)

CAMEO suite (w/EPA)

CAFÉ (Chemical Aquatic Fate & Effects)

ADIOS2 - [Spill Scenario1]

General NOAA Operational Modeling Environment - For Jordan (22-OCT-2014).SAV

Response Options Calculator v 1.05

Welcome to ROC

Welcome to the Response Options Calculator (ROC)

ROC can be used to assess system performance involving mechanical recovery, dispersant application, and the burning of oil.

ROC predicts:

- How the spilled oil will weather over time
- The volume of oil that can be recovered, burned or treated for the response systems selected.

To use ROC, click the buttons at the top of the page, working left to right. As you enter information graphs and reports become available as you progress through the simulation. Contextual help is displayed when moving the cursor over an input field name.

While some aids and guidelines are provided to help the user characterize certain response systems, the selection of input and the interpretation of results using those guidelines are solely the responsibility of the user. The developers and sponsors of the ROC Calculator assume no responsibility for any conclusions, decisions or actions reached or based upon output generated with the Response Options Calculator.

Assumptions and Limitations

Oil Mass Balance (Natural Processes & Response)

System Performance

RESPONSE OPTIONS CALCULATOR (ROC)

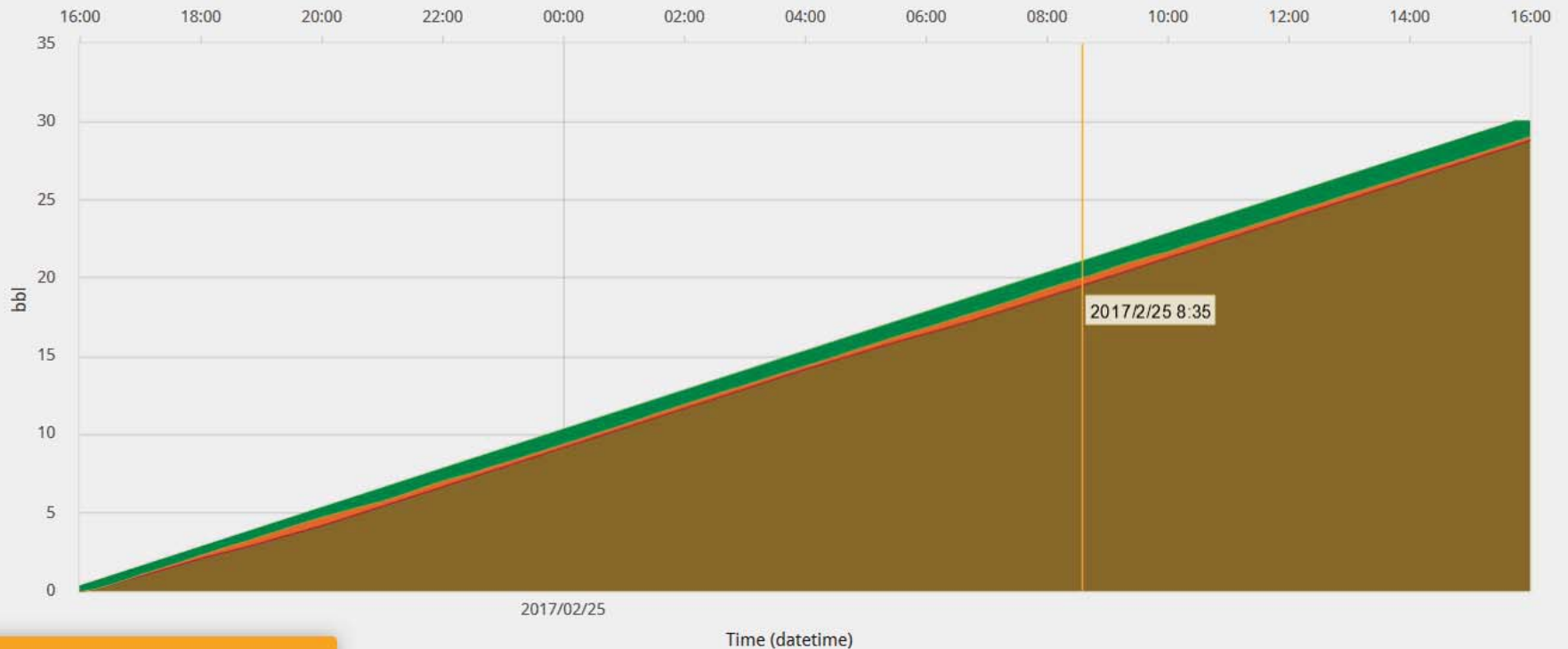


NOAA Oil, Hazmat & Tox Tools

WebG

WebGNOME [Home](#) [+ New](#) [Save](#) [Help](#)

Evaporated	Natural dispersion	Sedimentation	Dissolution	Beached	Off maps	Floating
29 bbl	0 bbl	0 bbl	0 bbl	0 bbl	0 bbl	1 bbl



! wind speed is 0 x

Available at: <http://response.restoration.noaa.gov>

NOAA Oil, Hazmat & Tox Tools

ADIOS

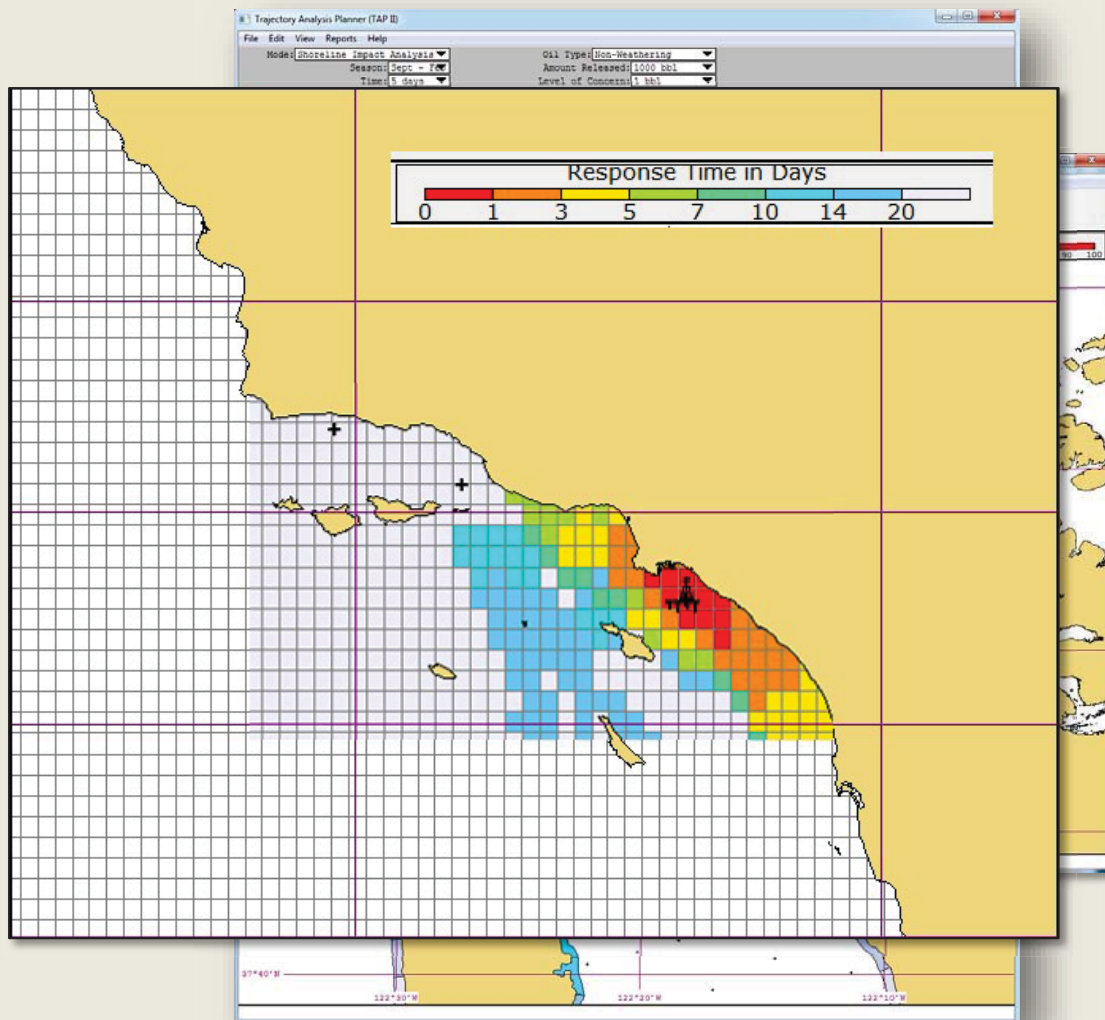
GNOME / GOODS

ROC (Response Options Calculator)

TAP (Trajectory Analysis Planner)

CAMEO suite

CAFÉ (Chemical Aquatic Fate & Effects)



NOAA Oil, Hazmat & Tox Tools

ADIOS

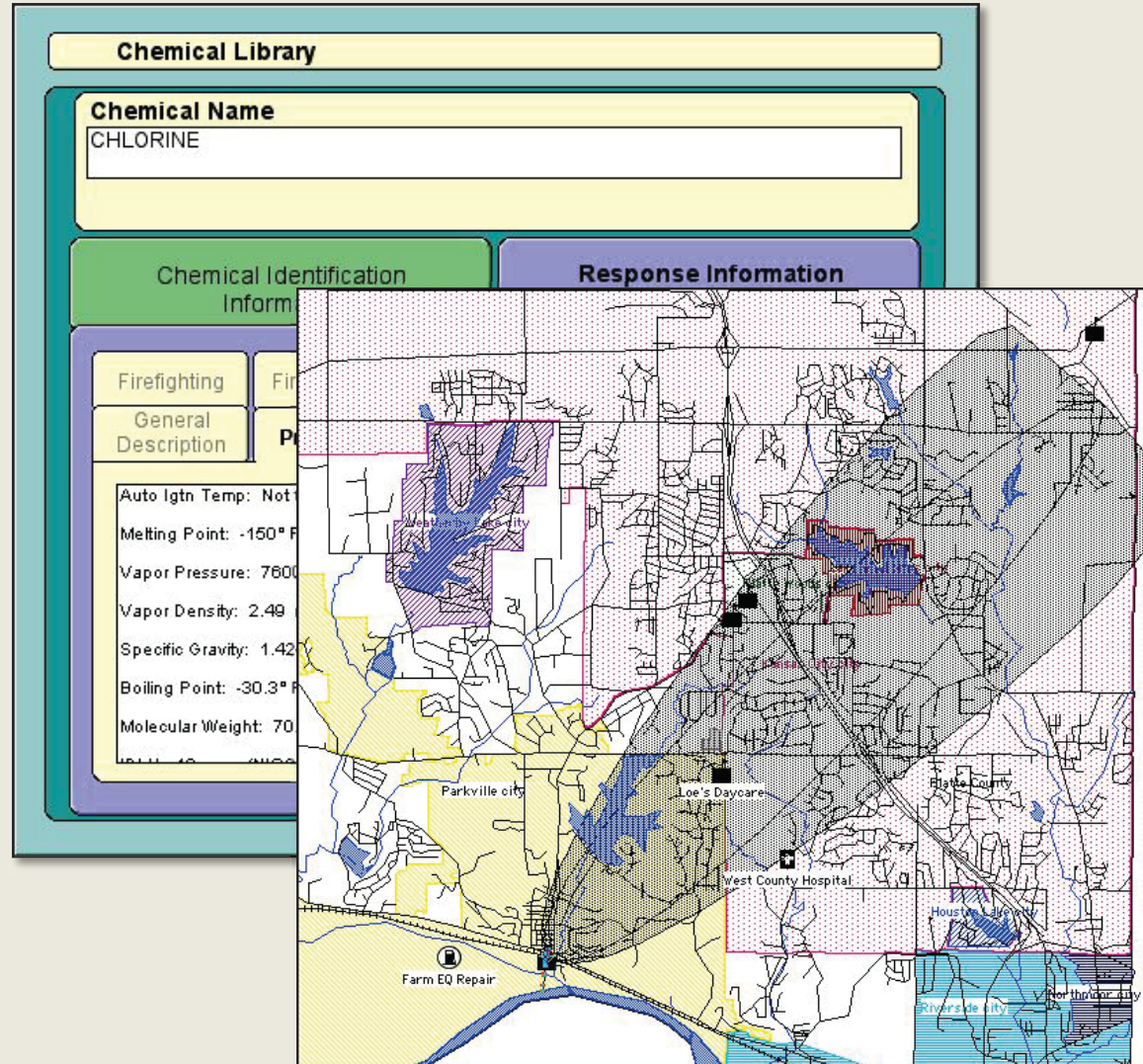
GNOME / GOODS

ROC (Response Options Calculator)

TAP (Trajectory Analysis Planner)

CAMEO suite (w/EPA)

CAFÉ (Chemical Aquatic Fate & Effects)



Chemical Library

Chemical Name
CHLORINE

Chemical Identification

Firefighting
General Description

Auto Ign Temp: Not
Melting Point: -150° F
Vapor Pressure: 7600
Vapor Density: 2.49
Specific Gravity: 1.42
Boiling Point: -30.3° F
Molecular Weight: 70

Response Information

Parkville city
Loe's Daycare
West County Hospital
Farm EQ Repair
Houston
Riverside City



NOAA Oil, Hazmat & Tox Tools

ADIOS

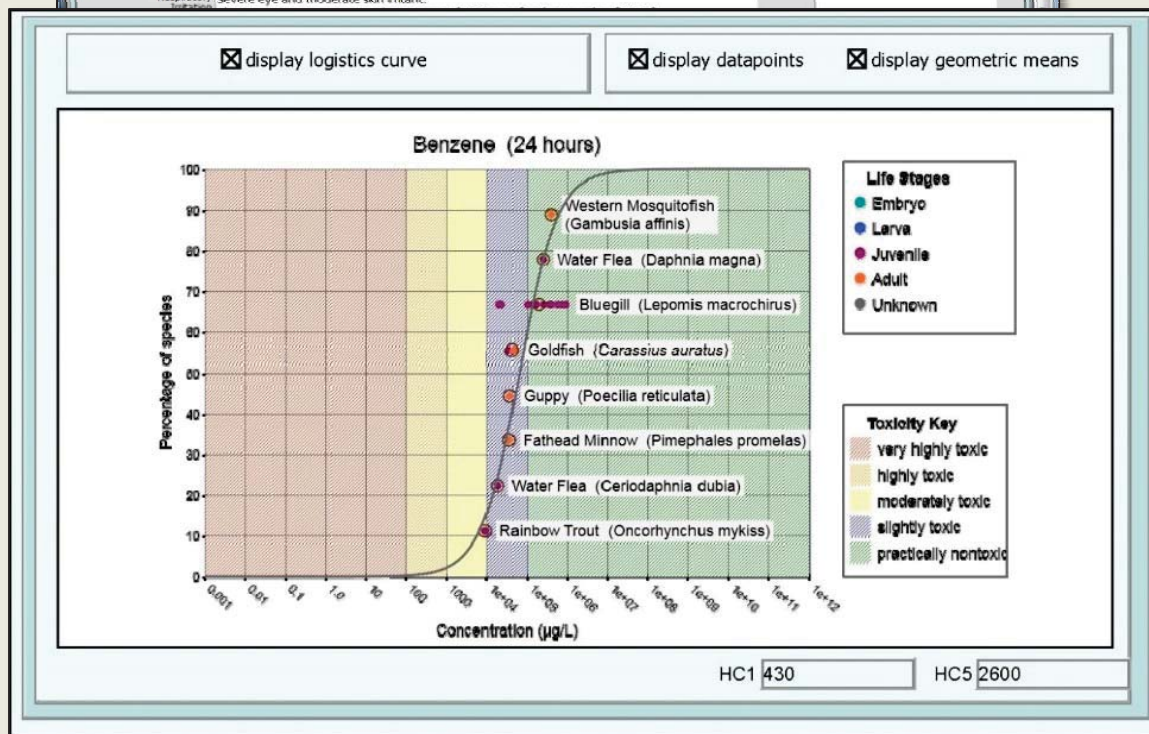
GNOME / GOODS

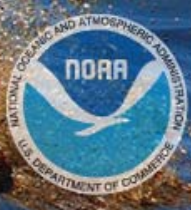
ROC (Response Options Calculator)

TAP (Trajectory Analysis Planner)

CAMEO suite (w/EPA)

CAFÉ (Chemical Aquatic Fate & Effects)





Questions?

Jordan Stout

NOAA Scientific Support Coordinator

Office: (510) 437-5344

Cell: (206) 321-3320

24-hour Spill Line: (206) 526-4911

E-mail: jordan.stout@noaa.gov