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REGIONAL RESPONSE TEAM 9 (RRT-9)

AUGUST WEBINAR

AUGUST 19, 2020

OILMAP

A PLANNING TOOL FOR REMOTE TESTING OF SENSITIVE SITE STRATEGIES

Gabrielle McGrath

Senior Scientist / Senior Project Manager

- 26 years on Active Duty in the U.S. Coast Guard, retired in 2018
- Served as Central Coast Area Committee Co-Chair and San Francisco Bay and Delta Area Committee Assistant Co-Chair
- Full rewrite of ACPs when serving as Chief, Marine Environmental Response, USCG Sector San Francisco
- Worked at RPS since July 2018
- Currently leading 5-year project with BSEE to develop offshore response information for RCPs/ACP

Gabrielle.McGrath@rpsgroup.com

Andrew Menton

Senior Software Development Project Manager

- Worked at RPS since March 2010
- Background in Software Engineering
- Manages the development and deployment of desktop and web based products; OILMAP, SARMAP, OceansMap, etc.
- Nationality: Irish

Andrew.Menton@rpsgroup.com

RPS OCEAN SCIENCE

- Formerly known as Applied Science Associates. Environmental scientists and engineers, based in South Kingstown, Rhode Island.
- Member of the RPS Group since October 2011.
- RPS is a global science and technology solutions company. Through consulting, environmental modeling, and application development, RPS helps a diverse range of clients solve their issues of concern.
- Since 1979 and in over 150 countries, RPS provides services and custom solutions to sectors including energy, environment, construction, defense, security, emergency management, transportation, and shipping.
- Significant work – Deepwater Horizon NRDA, Deep Water Port applications, EIAs, etc.
- Developers and users of OILMAP, commercially-available oil spill model for 30 years.

MARKETS SERVED

- Government Agencies, Worldwide
- Oil & Gas Industry
- Port, Harbor, and Coastal
- Renewable Energy
- Power Generation & Distribution
- Dredging & Pipeline Burial
- Water Resources
- Water Quality
- Ecological Risk Assessment
- Environmental Data Systems
- Geospatial Application Development
- Coastal Hazards Assessment
- Operational Forecasting

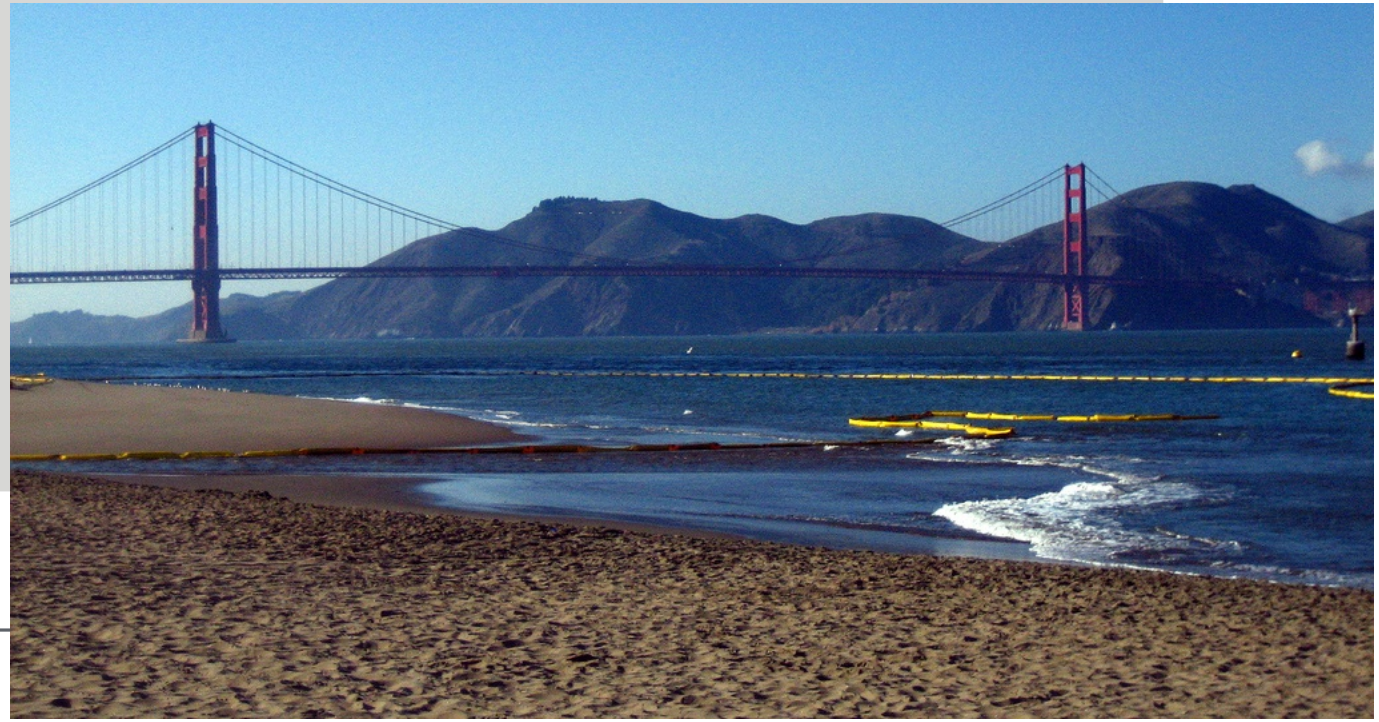
USES OF OILMAP

- EMERGENCY OIL SPILL RESPONSE DECISION SUPPORT
- OIL SPILL DRILLS AND EXERCISES
- OIL SPILL RESPONSE TRAINING
- PRE-POSITIONING OF RESPONSE CAPABILITIES
- LITIGATION SUPPORT
- CONTINGENCY PLANNING
- MANAGEMENT OF SPILL-RELATED DATA
- HINDCASTING
- WELL BLOW-OUT MODELING
- SENSITIVE SITE TESTING

BACKGROUND

- ACPs include Sensitive Site Strategies.
- For Sensitive Sites Testing in California, CA DFW OSPR leads the SSSEP (Sensitive Site Strategy Evaluation Program).
- Challenges of testing sensitive site strategies:
  - Ø Man hours
  - Ø Safety risk
  - Ø Social distancing requirements
  - Ø Regulatory consultations
  - Ø Limited environmental conditions

- OILMAP can reduce physical challenges of field deployments by enabling the user to test multiple strategies under different conditions within minutes from an office environment
- Benefits FOSC, State, Facility Owners, Public, Natural Resource Trustees, etc.



Containment of an oil spill with a boom near the Golden Gate Bridge, San Francisco, Nov 2007. Photo: Megan Jankowski / Marine Photobank

U.S. COAST GUARD AND OILMAP

- OILMAP includes unique capability of testing response strategies, including booming, skimming, and dispersants.
- OILMAP is perfect tool to test Sensitive Site Strategies without field deployments.
- USCG already subscribes to on-demand weather forecasts which drive the model.
- Currently being used by USCG Exercise Support Team for all PREPEX since 2015.
- Meets all USCG IT requirements.
- USCG D1 (Boston, MA), D5 (Portsmouth, VA), and Coast Guard Academy (CGA) purchasing OILMAP in FY20.
- CGA cadets tested Sector Delaware Bay Geographic Response Strategies as Directed Studies project in 2019-2020.

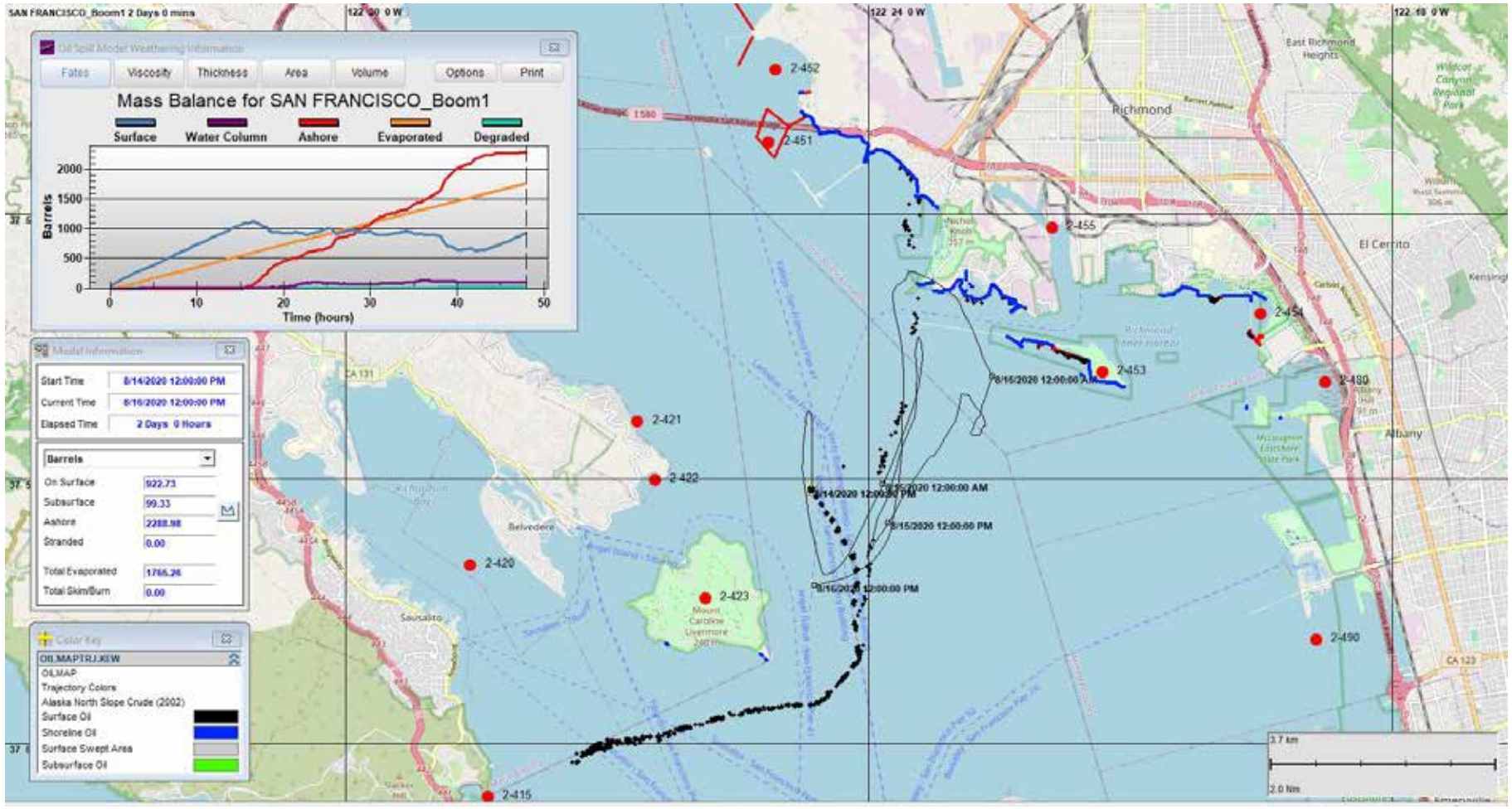
U.S. COAST GUARD AND OILMAP

- Meets requirements of CG-MER Manual for Geographic Response Strategy (GRS) Validation Levels 1 and 2.
- “Supplemented with computer simulations.”

Validation Level	Name	Description	Requirements
I	Desktop	Evaluation of GRS data by subject matter experts (i.e., natural resource trustees) in an office or workshop setting. Can be supplemented with computer simulations.	All data should attain Level I validation.
II	Visual Confirmation	Deployment of subject matter experts to specified geographic area. Visual inspection of operational environment and verification of tactical strategies. No equipment deployment. Can be supplemented with computer simulations.	Targeted for moderate to high-risk areas where a degree of uncertainty exists.
III	Equipment Deployment	Deployment of identified equipment to verify its performance in the specified operating environment.	Targeted for inconclusive Level II validation strategies. Performed in high-risk areas where rapid and efficient response is critical.
IV	Full Scale Exercise (FSE)	Deployment of all appropriate response personnel and equipment under an area full scale exercise setting.	As dictated by the area exercise design/objectives.
V	Incident	Deployment of all appropriate response personnel and equipment for an actual incident.	Real world event.

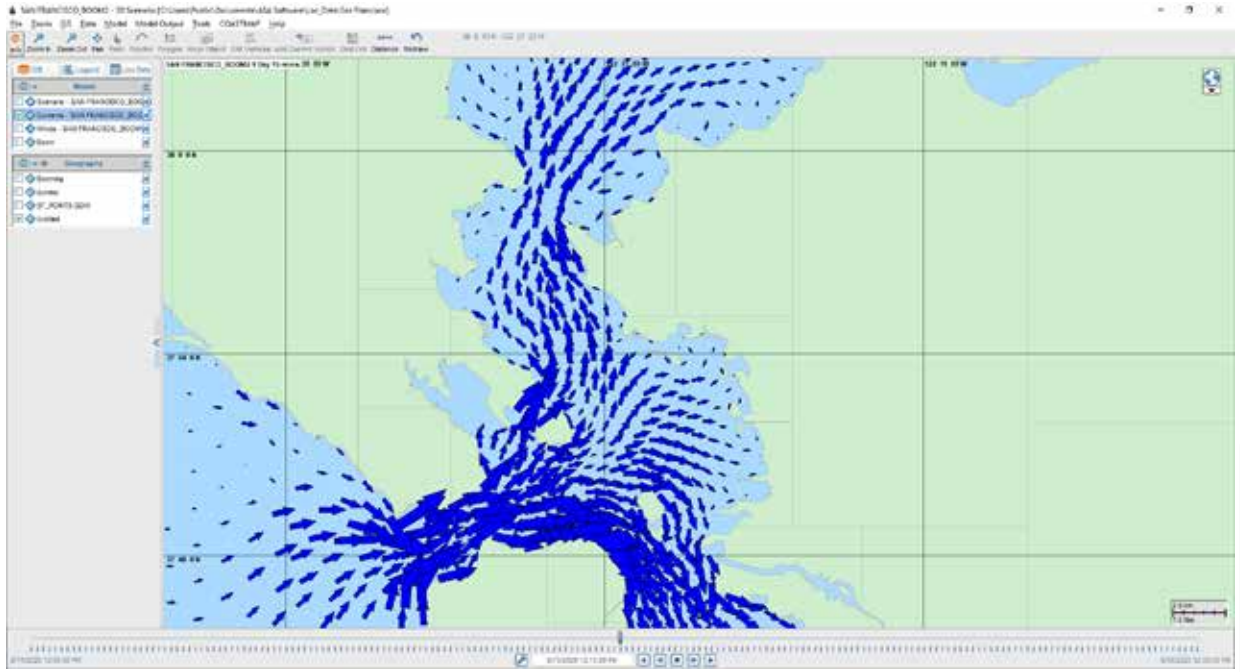
Table 4-1: Geographic Response Strategies (GRS) Tiered Validation Levels

MODELING RESPONSE STRATEGIES WITH OILMAP



ENVIRONMENTAL INPUTS TO OILMAP: CURRENTS

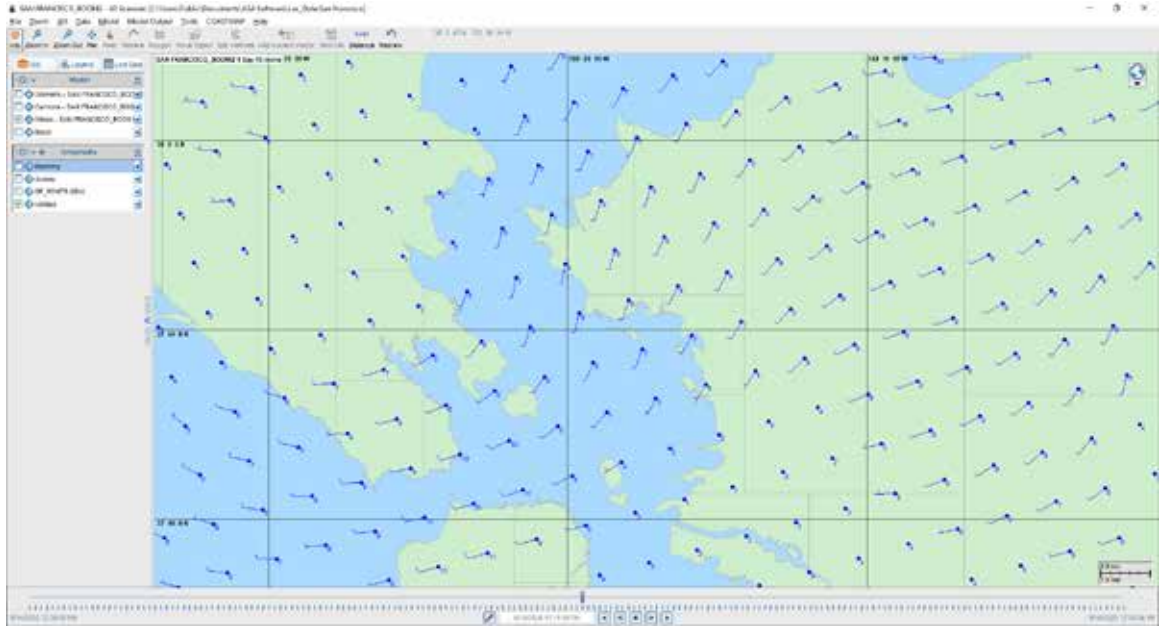
- Data distributed by RPS' Environmental Data Server (EDS)



Example uses regional ADCIRC current model

ENVIRONMENTAL INPUTS TO OILMAP: WINDS

- Data distributed by RPS' Environmental Data Server (EDS)
  - Model Forecasts
  - Measurements and Observations
  - Local, Regional, & Global Datasets Available
  - Ongoing Integration of New Data Sources
  - Critical input to trajectory and fate model
  - Spatially- and temporally- varying
  - Downloaded for extent of simulation
  - Wind speed by color/arrow size
- User can define wind field manually



Example uses North America 5km wind model

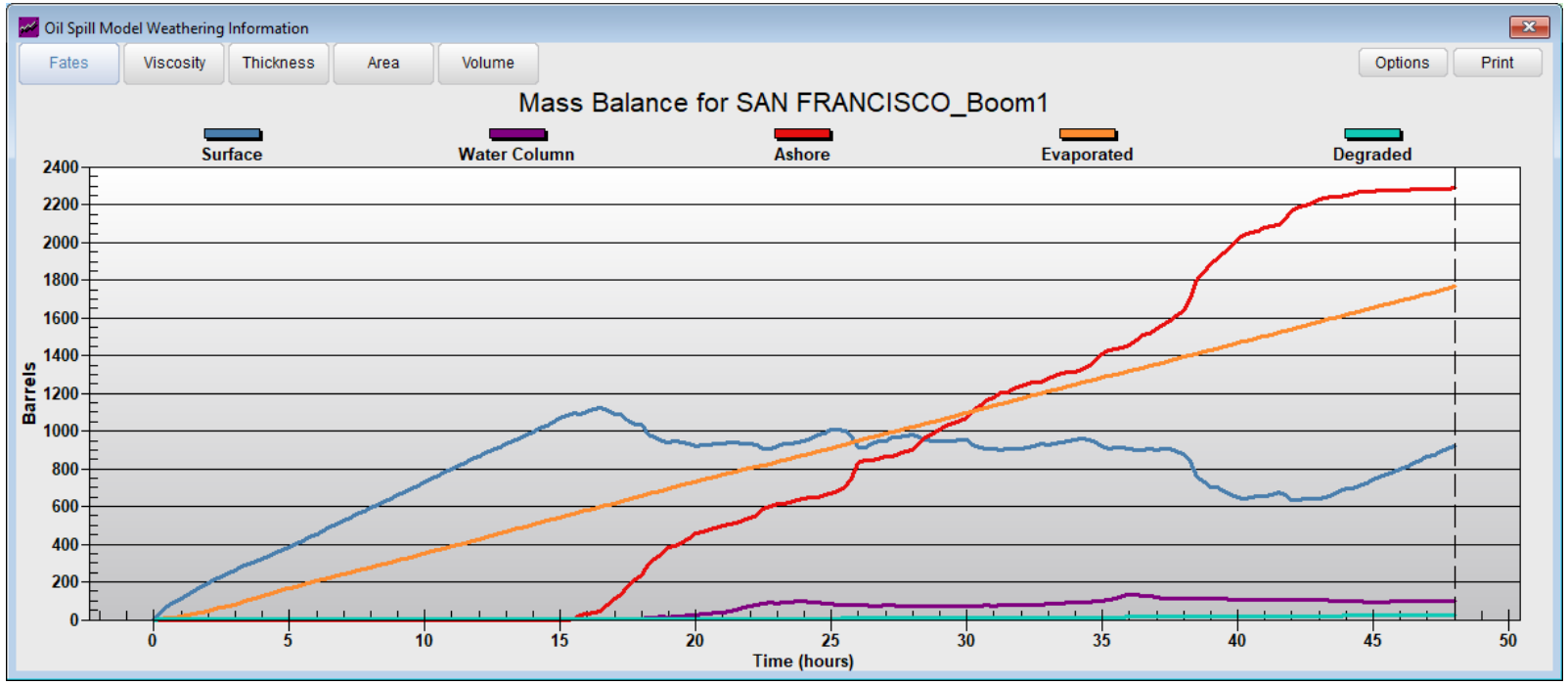
Capabilities:

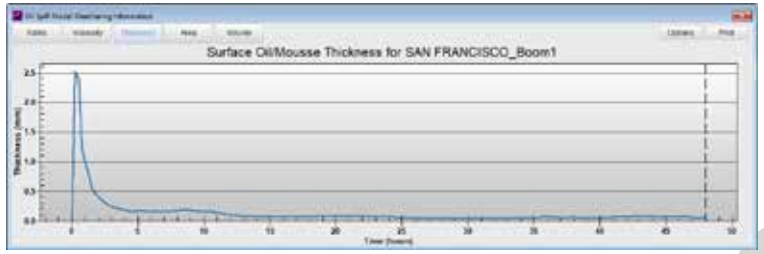
- Full 3D Trajectory & Fate Model
- Near-Field Blowout Model
- Air Model
- Integrated GIS
- Blowout plume dynamics
- Response activities

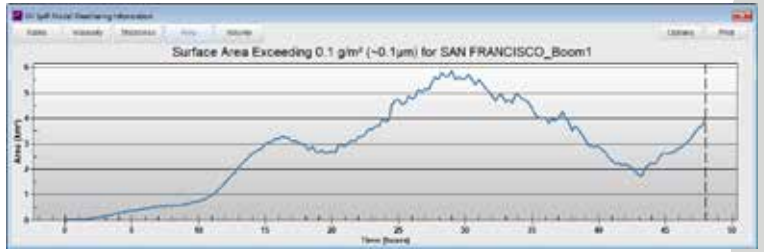
Outputs:

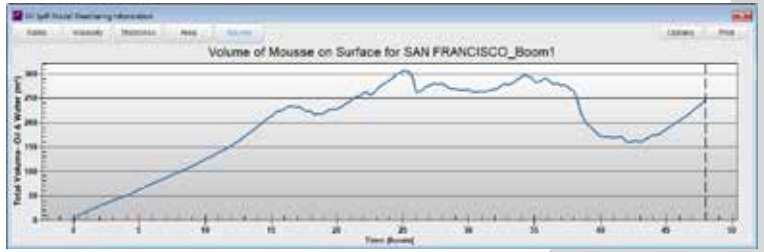
- Oil particle characteristics
- Floating surface oil
- Water column concentrations
- Shoreline oiling
- Evaporated hydrocarbons

OILMAP OUTPUTS



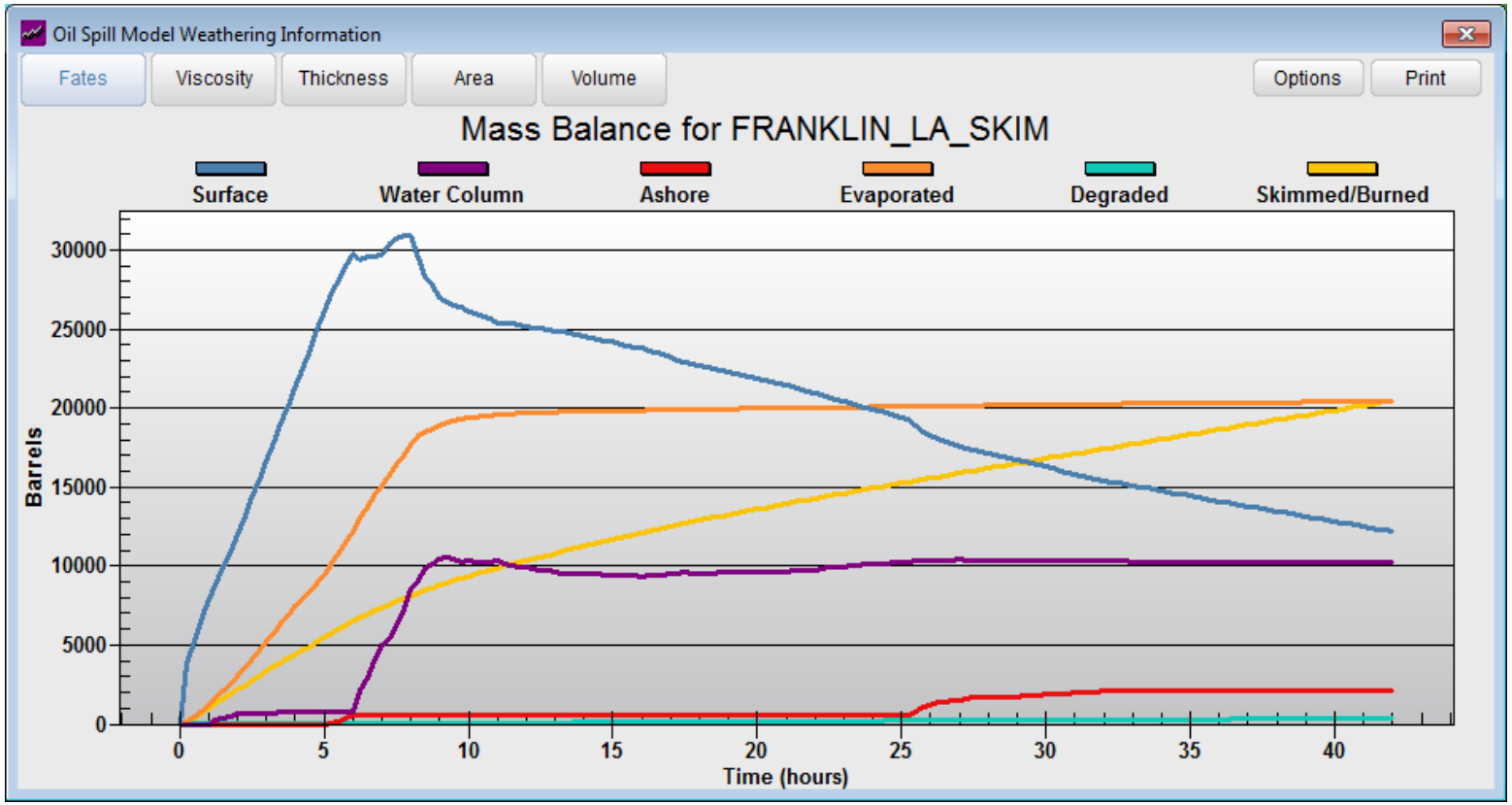




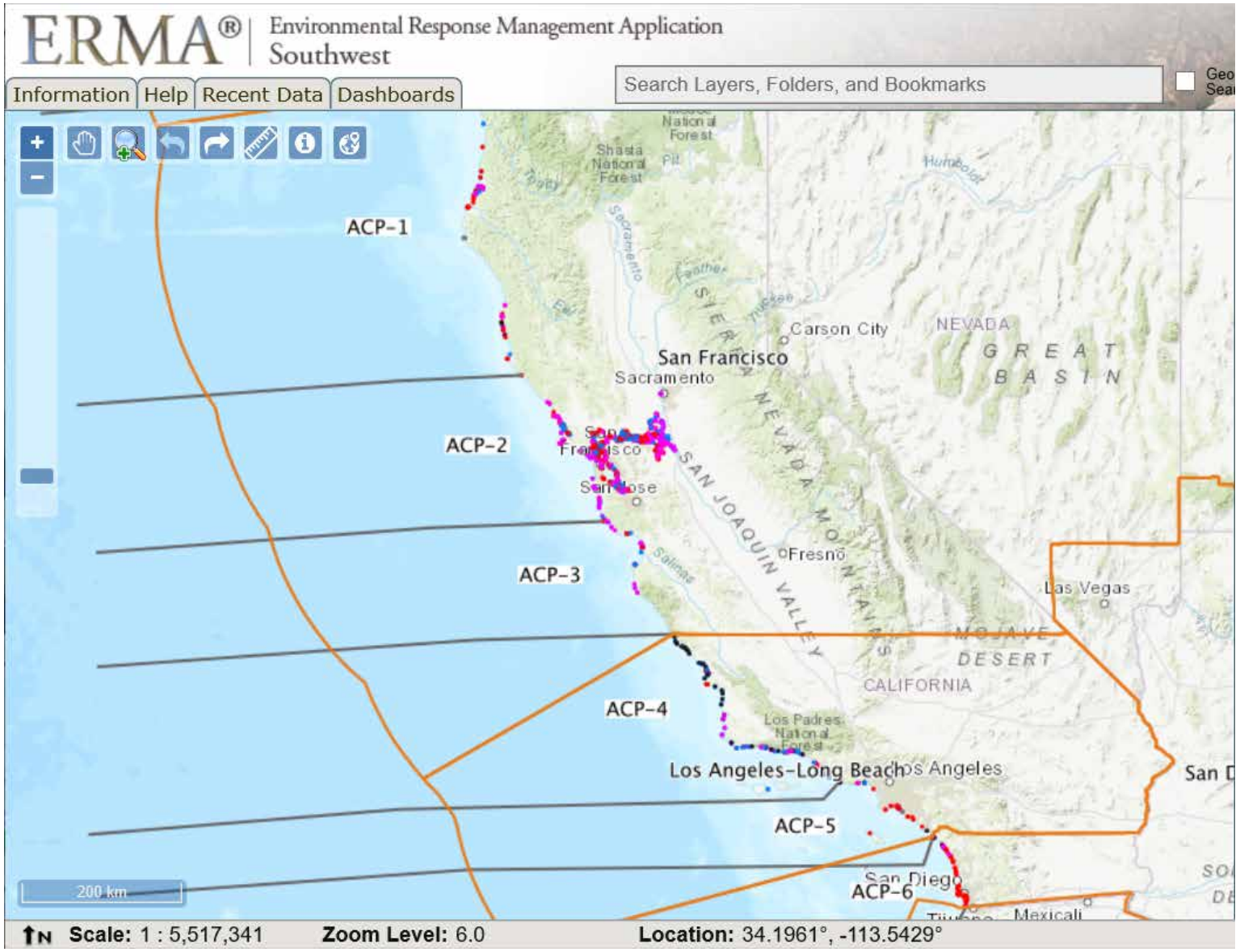


- Trajectory Maps
- Mass Balance
- Surface Area, Viscosity, Volume, Thickness
- All Temporally and Spatially-Varying
- Plots, graphs, tabular data, SHP, and KML exports

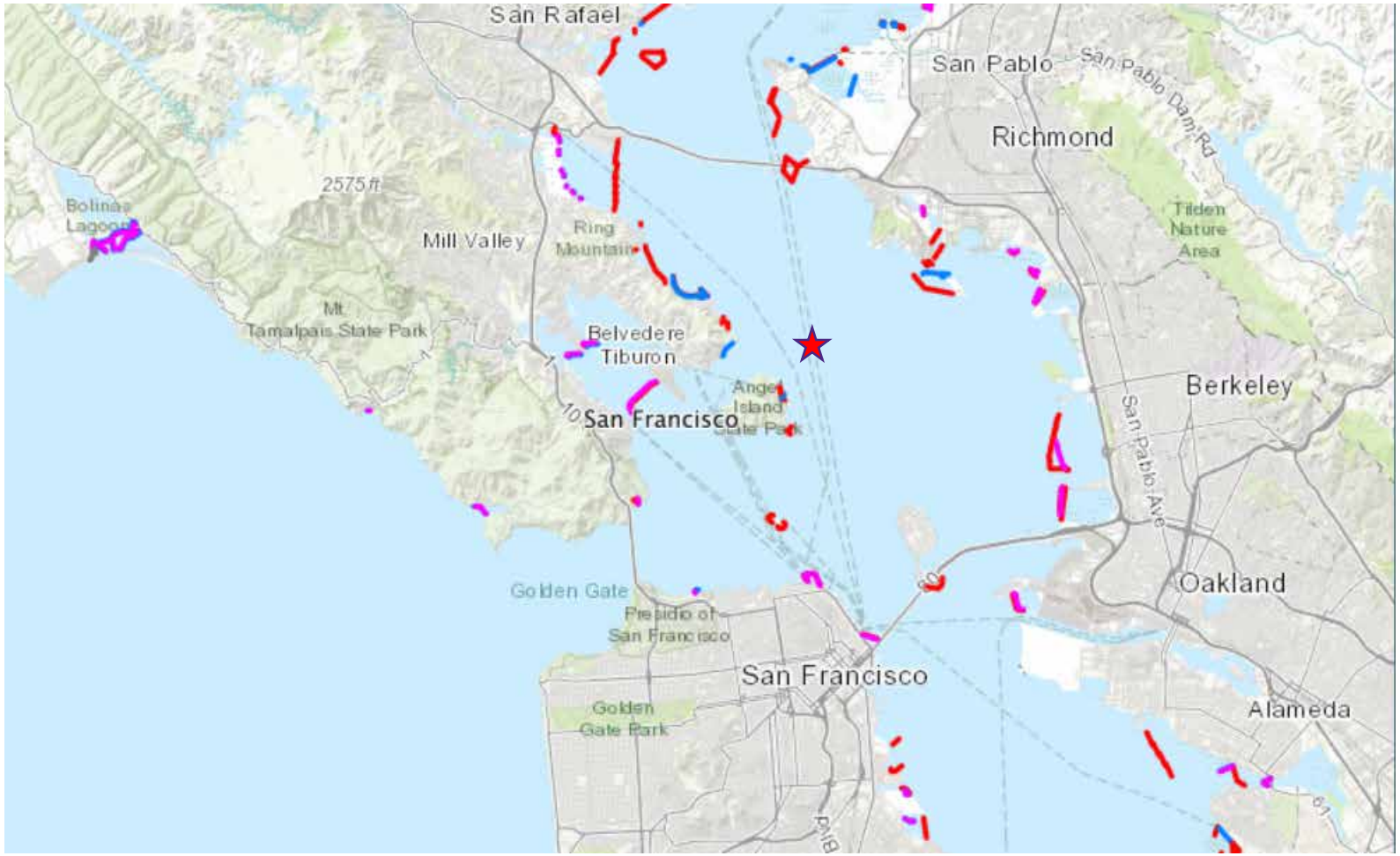
RESPONSE ACTIVITIES IN OILMAP



Sample Scenario in San Francisco Bay Using ACP Sensitive Site Strategies

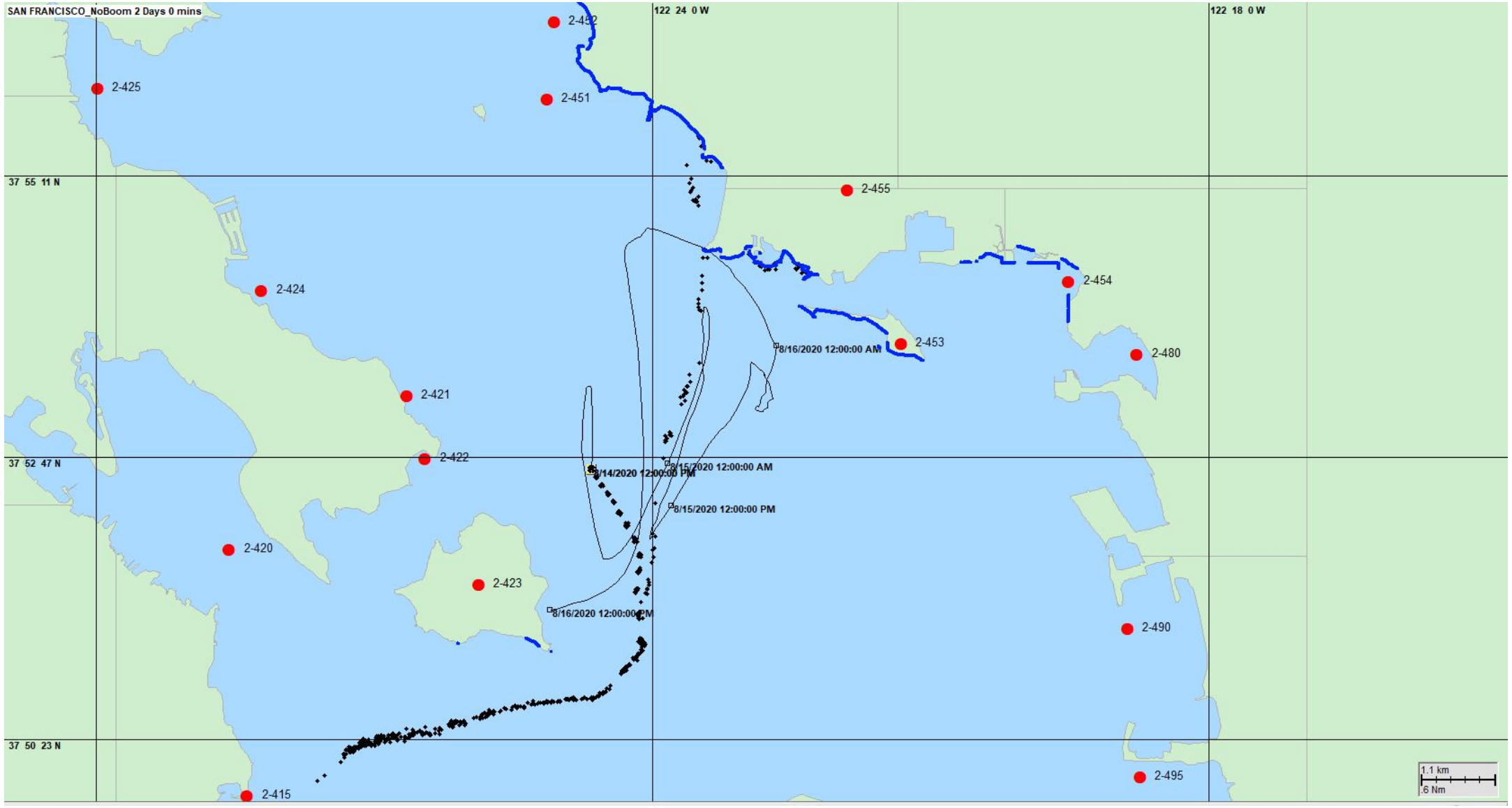

ERMA®
Environmental Response Management Application
Southwest
Information
Help
Recent Data
Dashboards
Search Layers, Folders, and Bookmarks
ACP-1
ACP-2
ACP-3
ACP-4
ACP-5
ACP-6
San Francisco
Sacramento
Carson City
NEVADA
GREAT BASIN
Fresno
Las Vegas
MOJAVE DESERT
CALIFORNIA
Los Angeles-Long Beach
San Diego
Mexicali
200 km
Scale: 1 : 5,517,341
Zoom Level: 6.0
Location: 34.1961°, -113.5429°

SCENARIO PARTICULARS

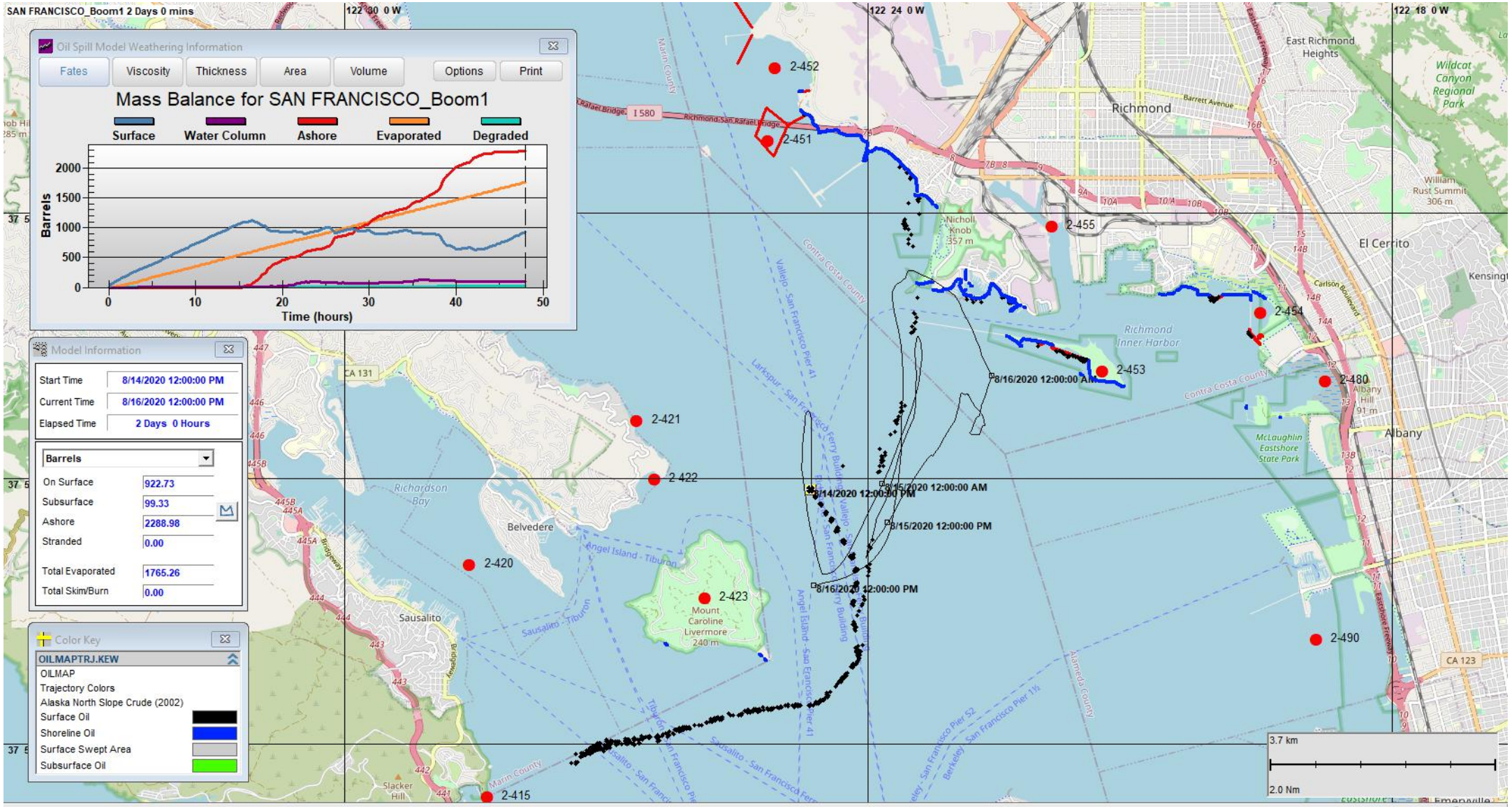


- Tanker loaded with Alaska Crude headed inbound to Chevron Richmond facility collided with outbound tanker in fog
- 14th August 2020 12:00PM
- 5000 Barrel continuous release over 48 hrs
- (105 per hr)

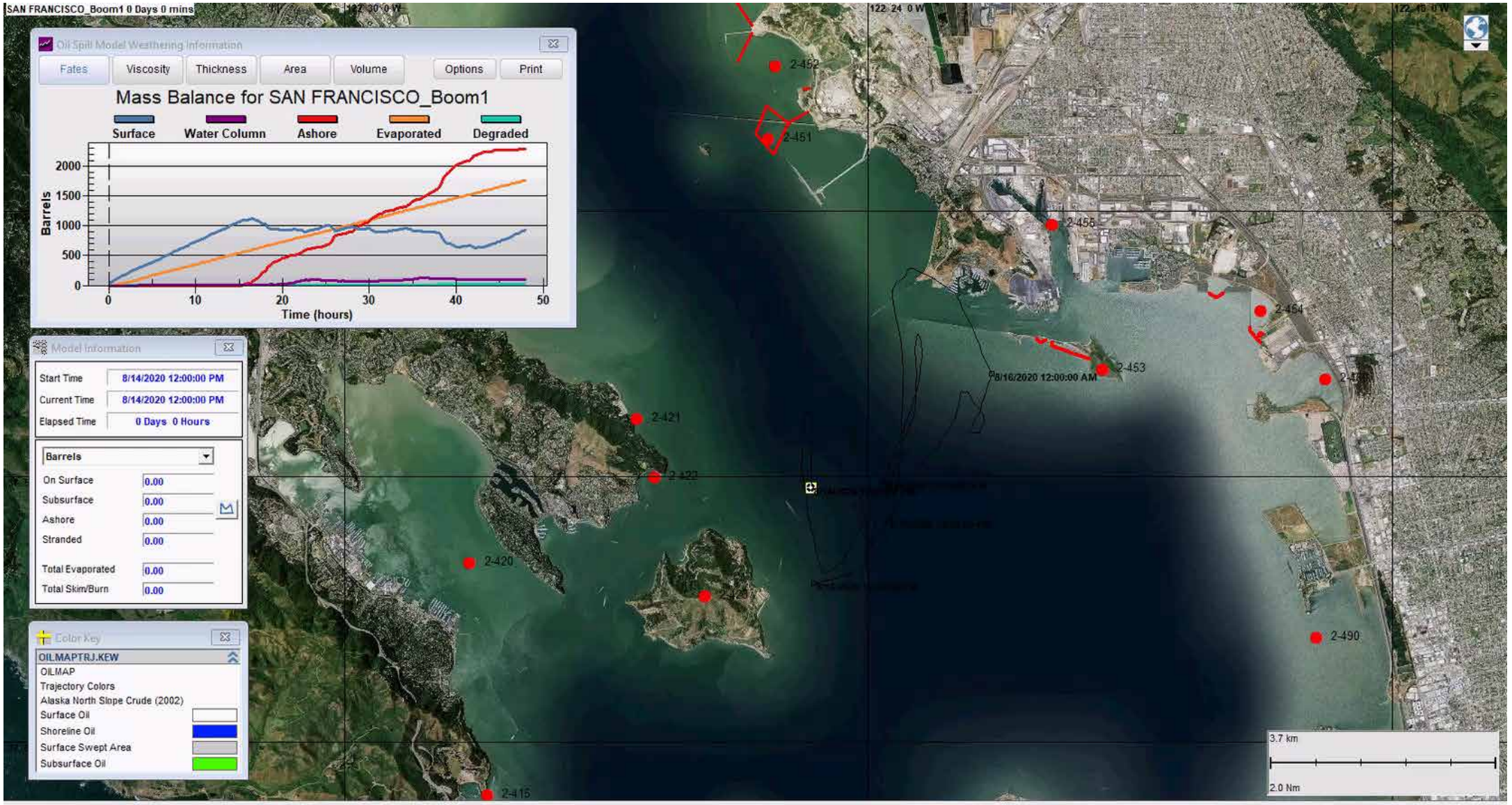
MODELING RESPONSE STRATEGIES WITH OILMAP – BASIC BASEMAP



MODELING RESPONSE STRATEGIES WITH OILMAP – STREET BASEMAP



MODELING RESPONSE STRATEGIES WITH OILMAP – VIDEO



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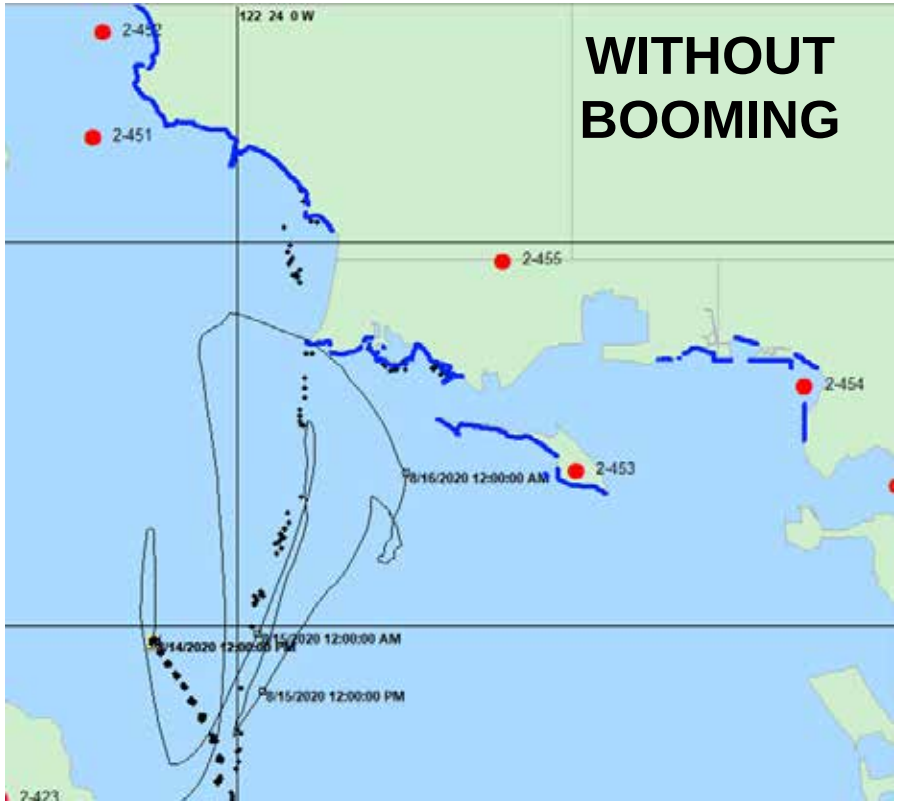
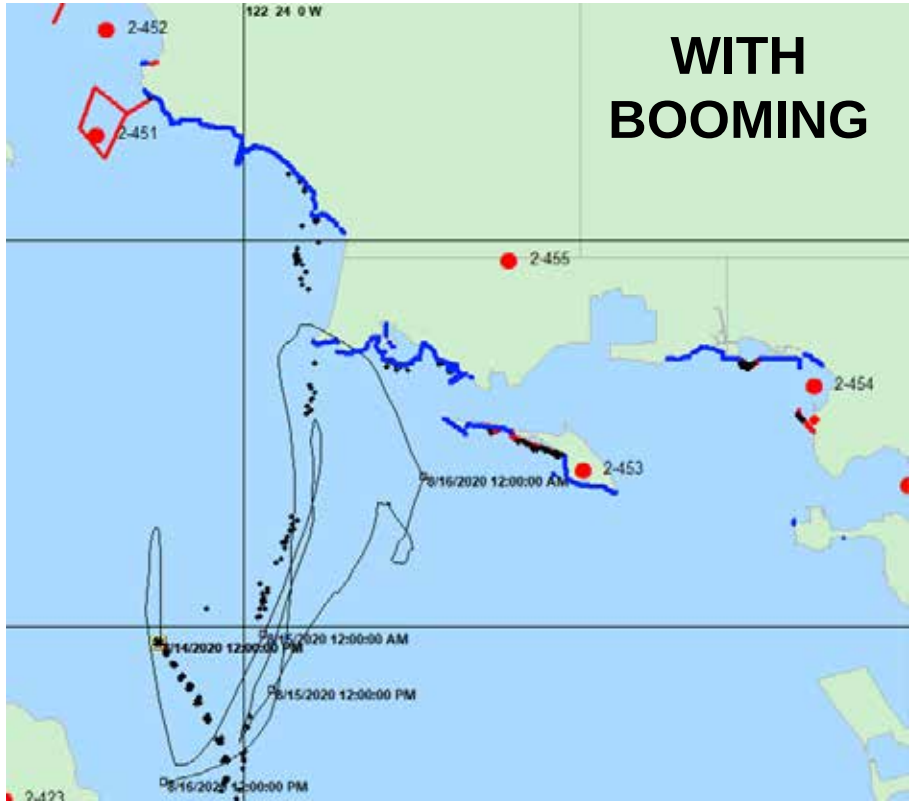




Deploy Time: 10 hours
Current Thres: 1 knot
Wave Thres: 2 feet
Wind Thres: 10 knots

BENEFITS OF TESTING SENSITIVE SITE STRATEGIES WITH COMPUTER SIMULATIONS

- Quickly evaluate a wide range of response activities.
- Assess each response strategy under varying environmental conditions (winds, currents, temperature, salinity).
- Make edits to response strategy based on model results and re-test.
- Compare and assess all strategies.
- More cost-effective, safer, and more efficient than field deployments.
- Better preparation for incidents for inclusion in the ACP for use by all responders.

QUESTIONS?

GABRIELLE McGRATH

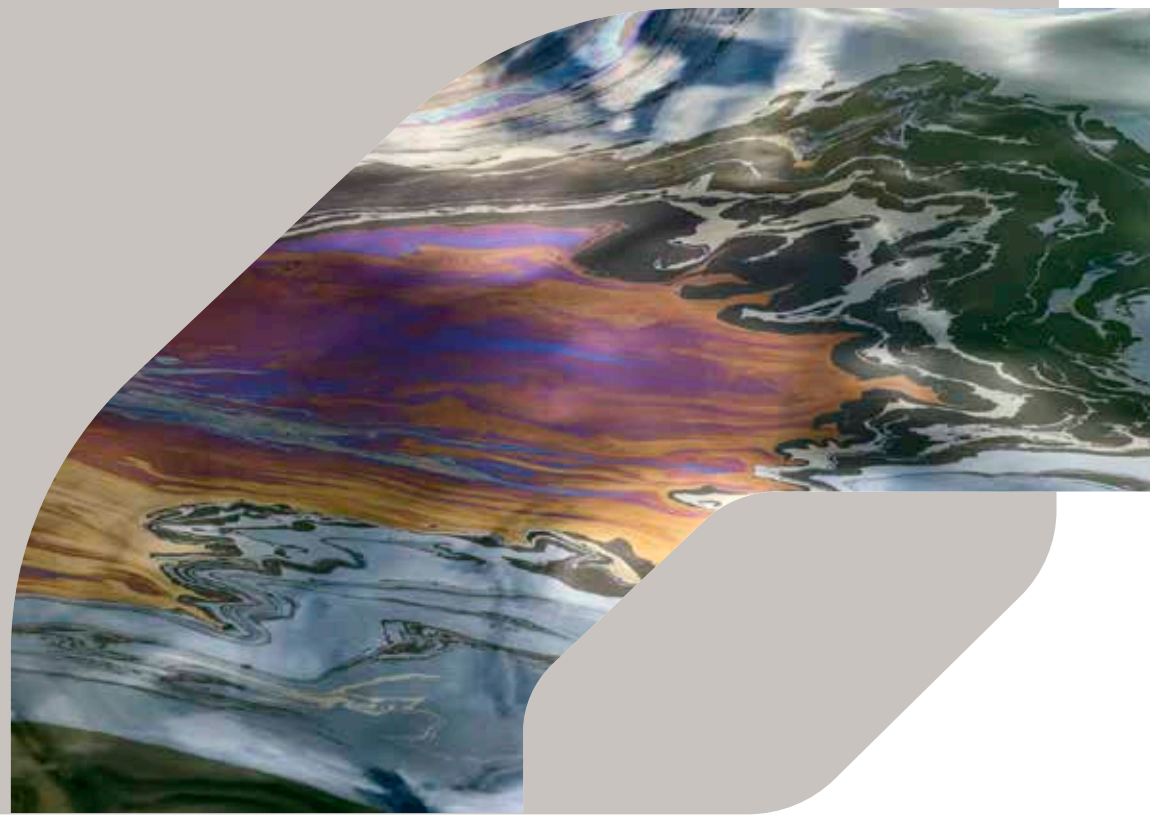
Senior Scientist / Senior Project Manager

Gabrielle.McGrath@rpsgroup.com

ANDREW MENTON

Senior Software Development Project Manager

Andrew.Menton@rpsgroup.com



55 Village Square Drive

South Kingstown, RI 02879

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