



NOAA SSC Role and Use of Science During Response

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Outline

Oil – Uses & Sources to the Environment

Response Distribution

Key Roles: NOAA, SSC, ICS, EU

Response Time Line

How Science is Used in Response

– Techniques & Tradeoffs



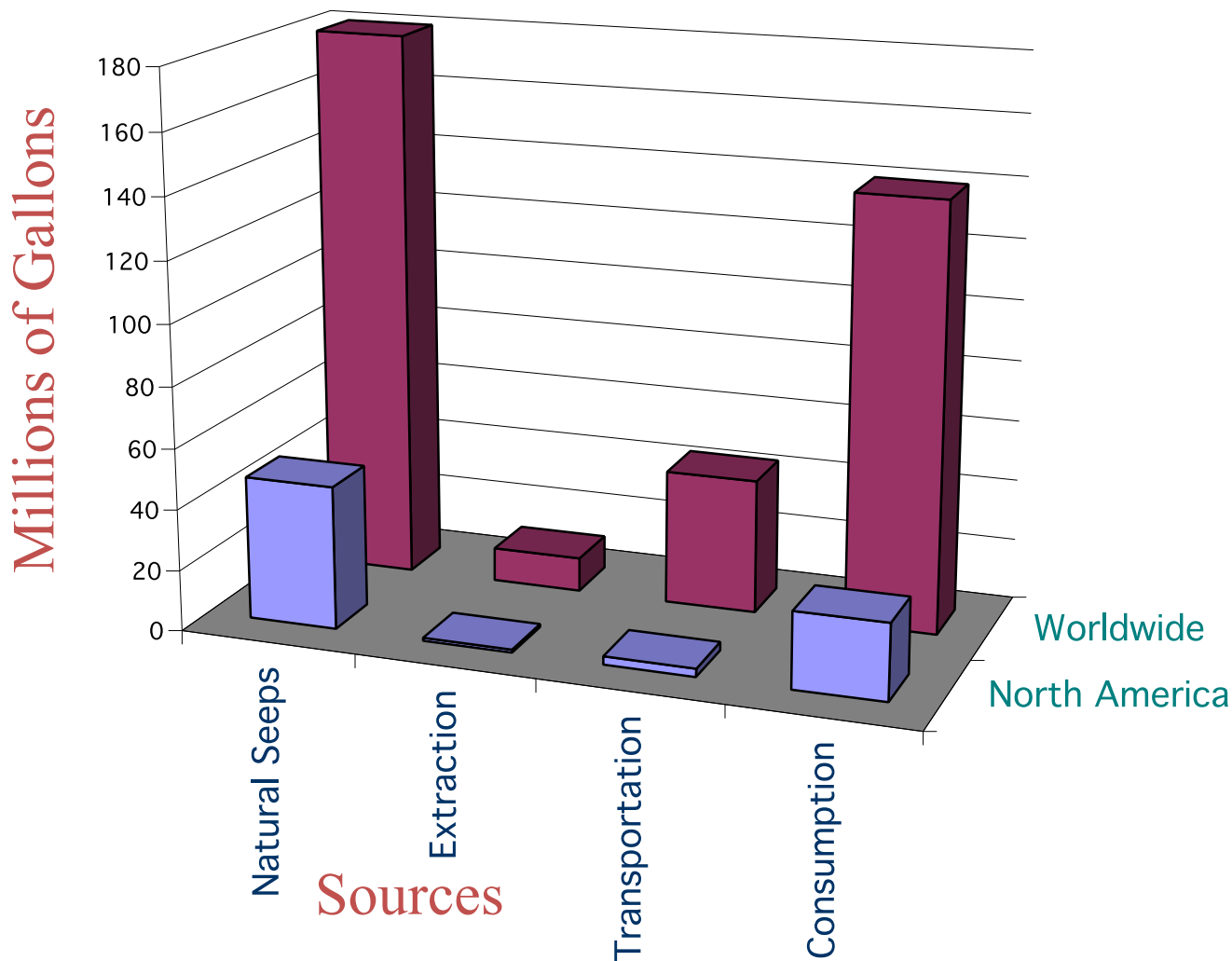
What Is All That Oil Used For?

- * Fuel (for transportation and factories)
- * Electricity generation
- * Machinery
- * Asphalt
- * Heating
- * Wax (crayons, candles)
- * Medicines
- * Ink
- * Plastics
- * Fertilizers
- * Pesticides
- * Paints/varnishes
- * Etc., etc., etc.

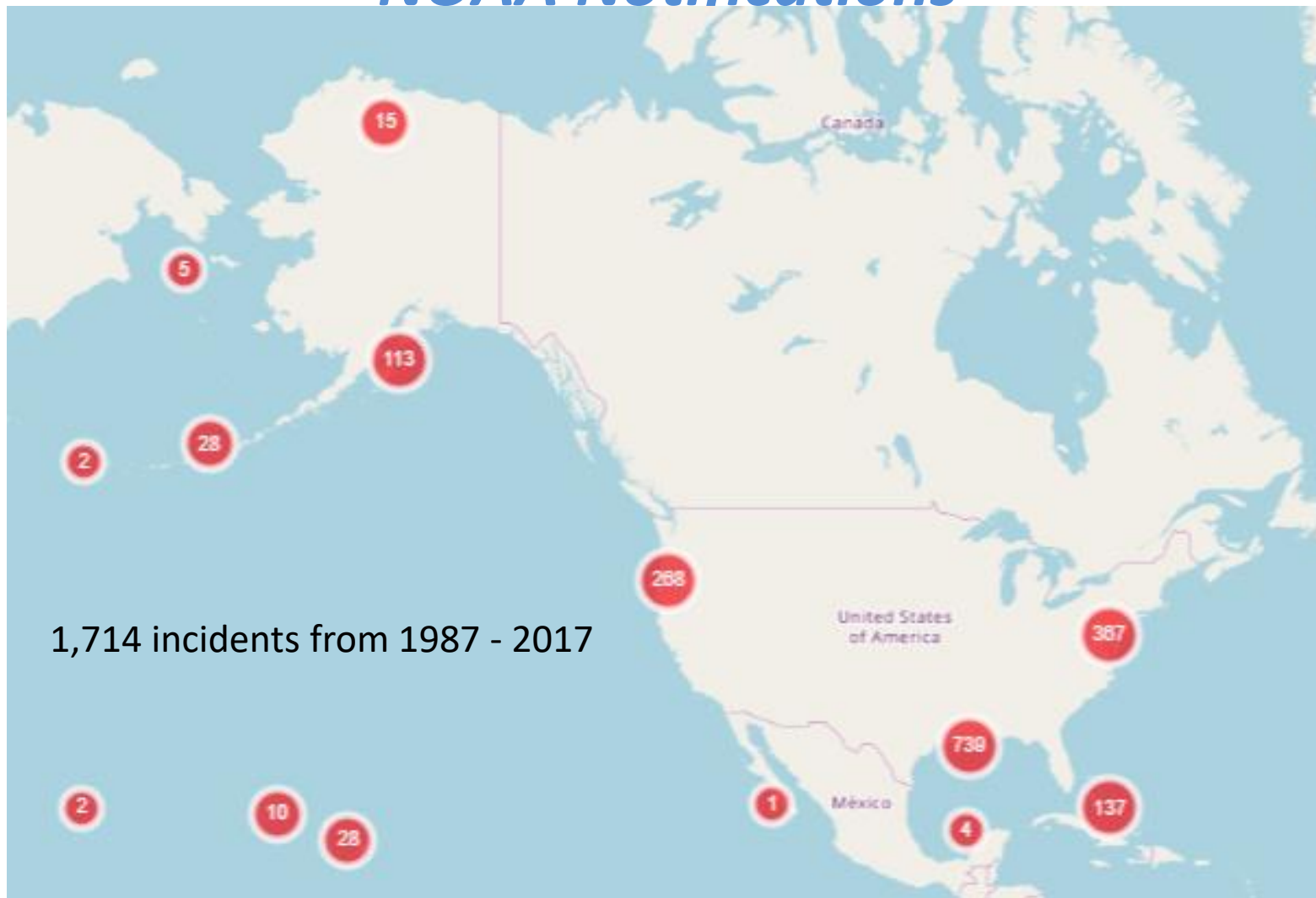
- hair spray
- cosmetics
- sandals/flip flops
- plastic hangers
- polyester clothing
- children's balls
- freezer bags
- storage containers
- egg cartons
- marking pens
- faux fur
- hair gel
- toiletries
- ballpoint pens
- phones
- trash bags
- toys
- shopping bags
- band-aids
- disposable plates
- office equipment
- pantyhose
- balloons
- pet toys
- vertical blinds
- picture frames
- photo albums
- document binders
- Teflon products
- candles
- garden hose
- kitchen utensils
- spray paint

petroleum jelly **and many more products!**

Estimates of Annual Petroleum Inputs to the Sea



30 Year Cumulative US Oil Spills NOAA Notifications



1,714 incidents from 1987 - 2017

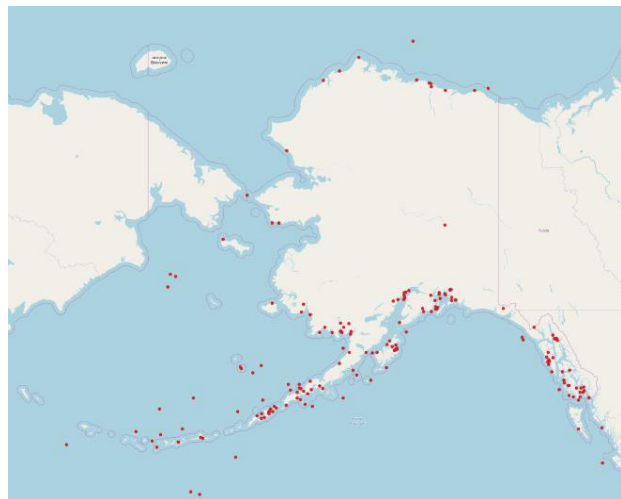
From NOAA ORR Hotline



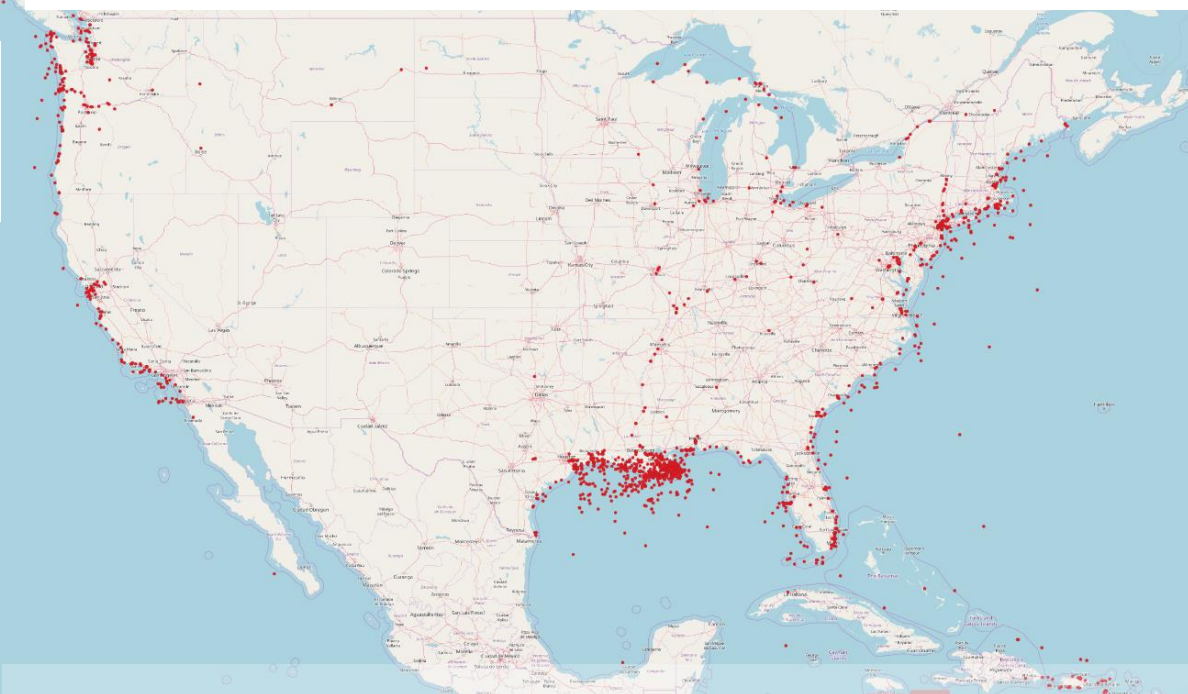
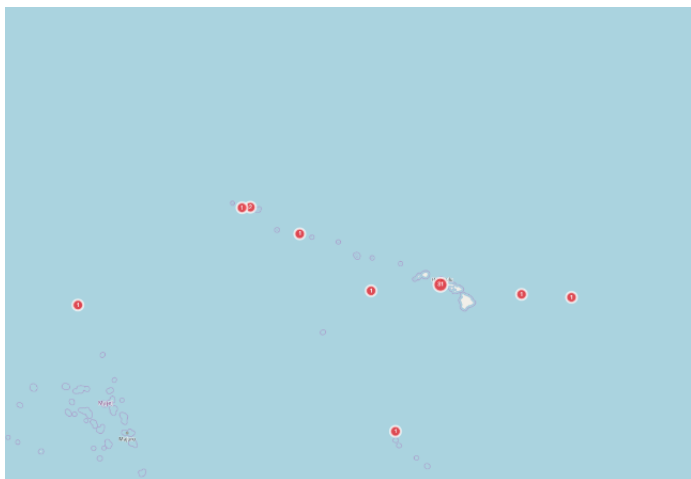
30 Year Distribution of US Oil Spills

NOAA Notifications

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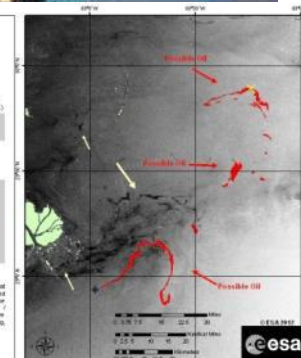
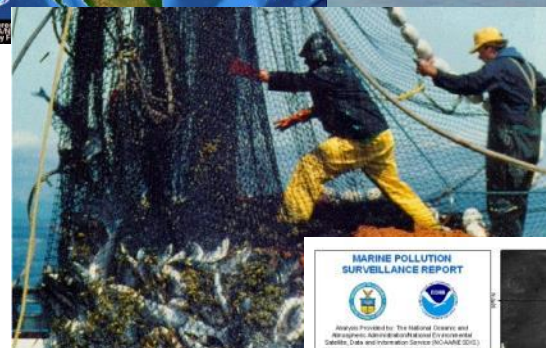
NOAA's Roles & Mandates During Spills

Spill-Specific Roles:

- **Scientific Support Coordinator**
 - SSC as Special Team, 40CFR300.145(c)
- **Natural Resources Trustee (emergency role, Damage Assessment & Restoration)**
 - DOC/NOAA Role (Federal Agency Roles, 40CFR300.175(b))
 - Trustees for Natural Resources (Subpart G, 40 CFR 300.600)
 - NRDA Regulations (43 CFR 11, 15 CFR 990)

Important Supporting Roles:

- Weather Forecasting
- Fisheries Management
- Protected/Endangered Species
- Satellite Interpretation
- Emergency Navigation Hazard Detection





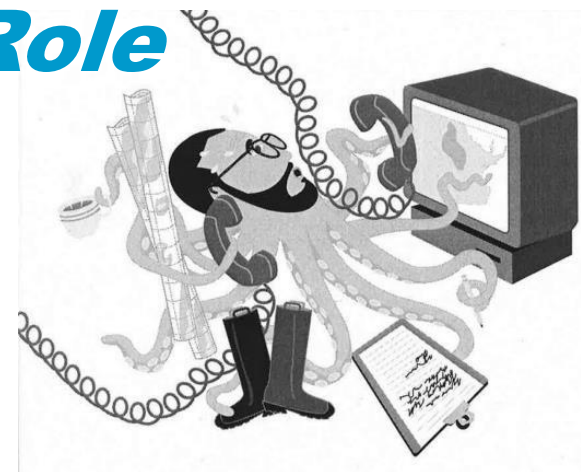
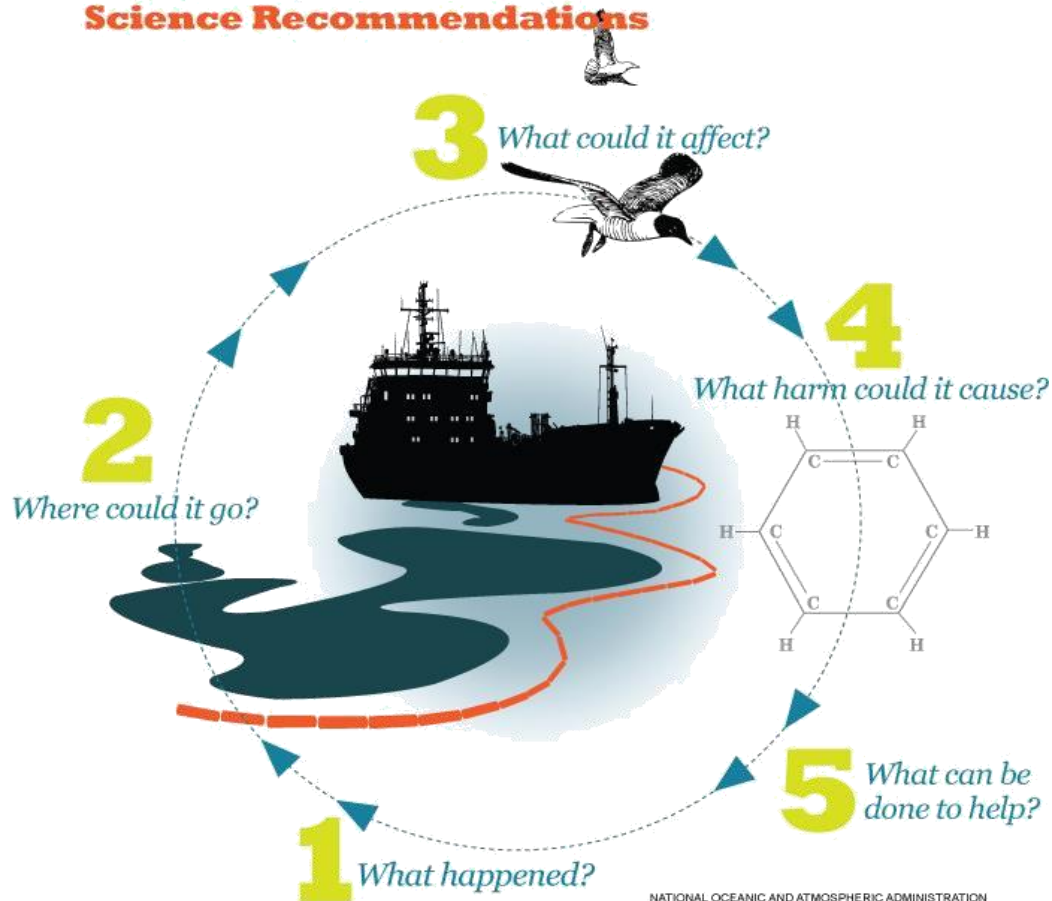
NOAA SSC arrives

Incident occurs.....

Happy Captain!

Scientific Support Role

Questions Guiding NOAA's Oil Spill Science Recommendations



Scientific Support Coordinator

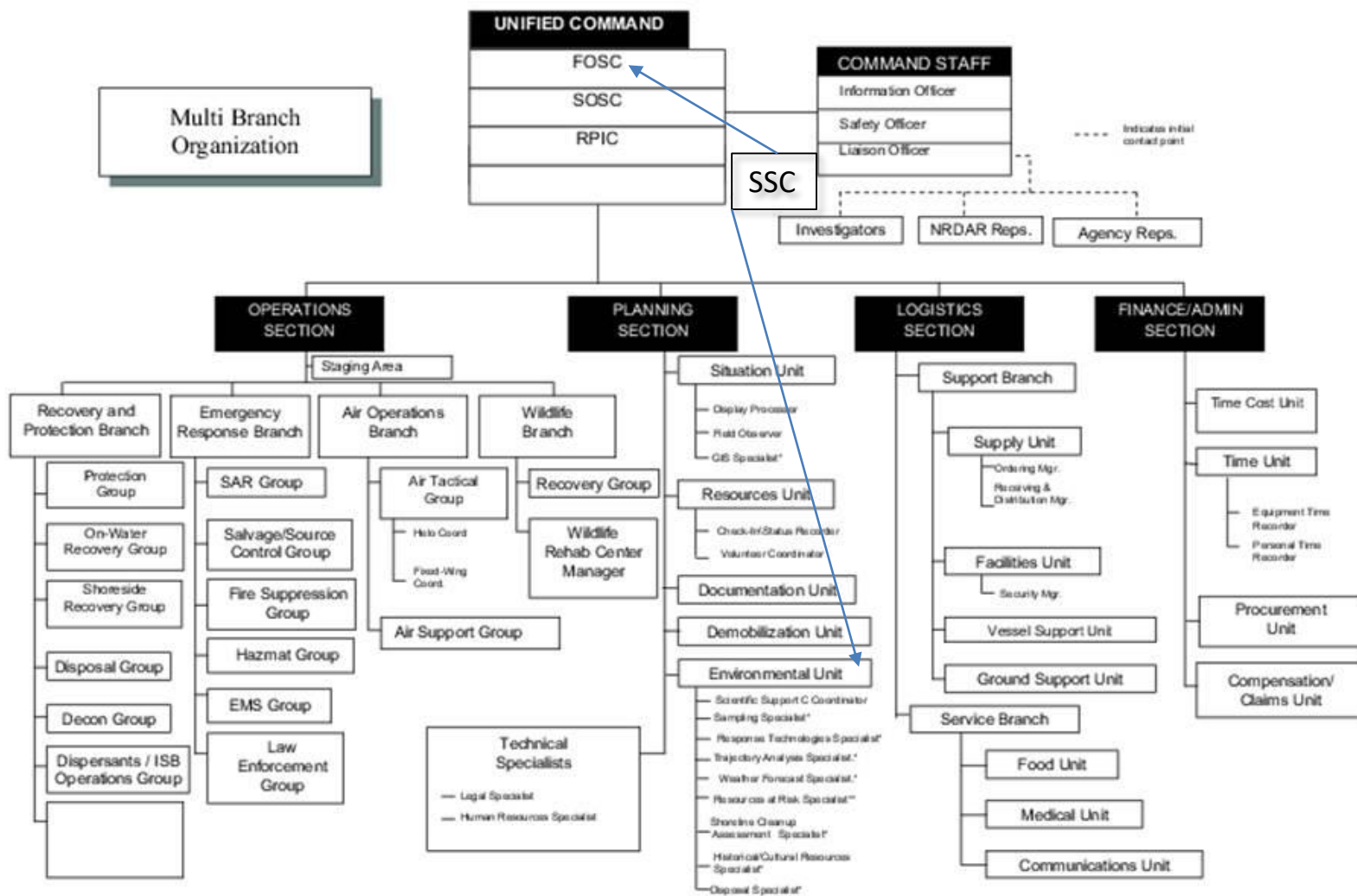
Activities

- Trajectory Modeling
- Identify resources at risk
- Evaluate cleanup strategies
- Perform shoreline assessments and aerial observations
- Coordinate NOAA resources (i.e. forecasts, fisheries)
- Analyze pollutant chemistry & environmental effects
- Data management
- Train emergency responders
- **Coordinate scientific activities with academia and industry**





Incident Command System



* Recommended Possible Assignment of Technical Specialists



Environmental Unit

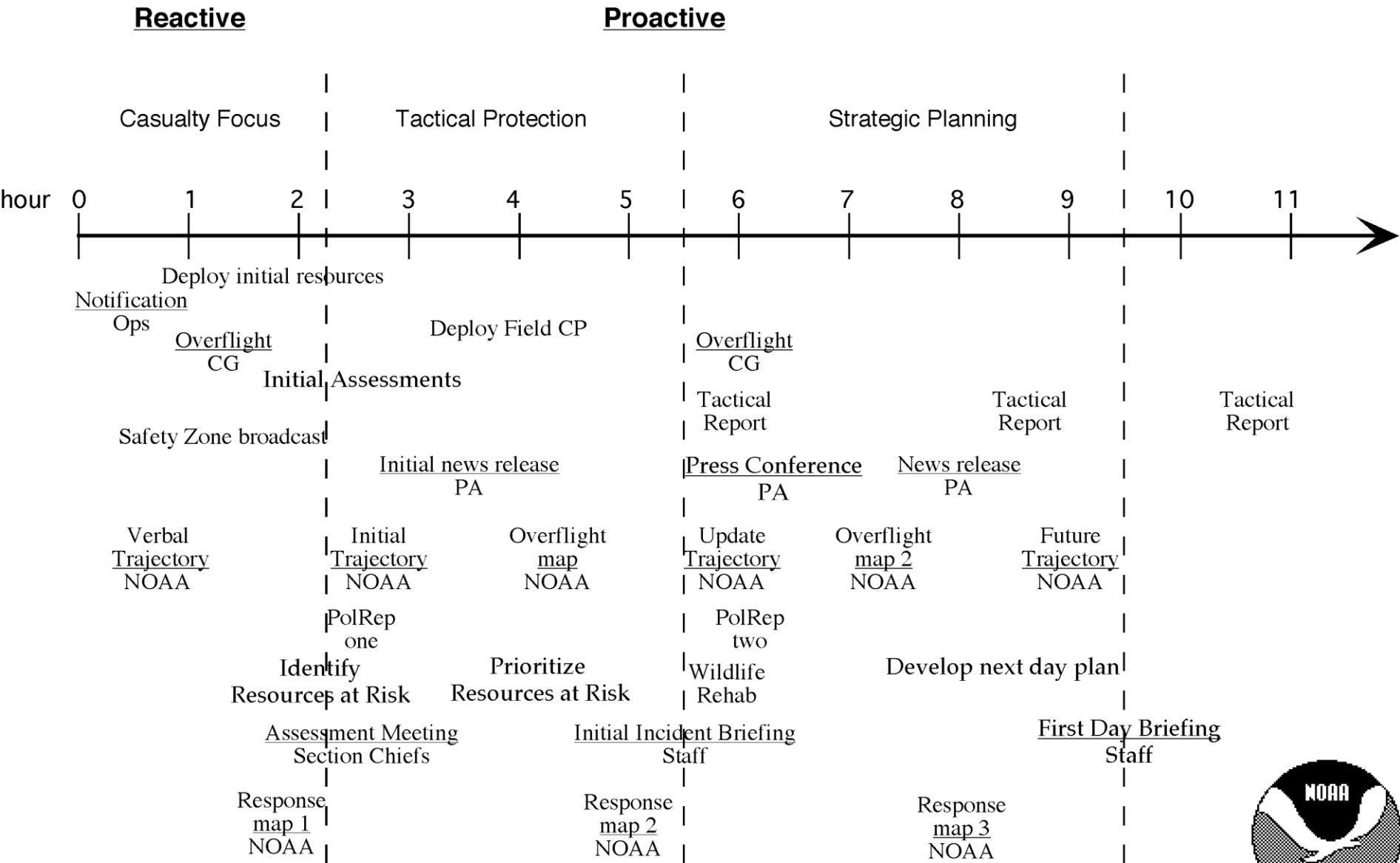
EU works in the Planning Section under the Incident Command System

Key responsibilities to ensure that any response to an incident addresses environmental, cultural, and socioeconomic priorities.

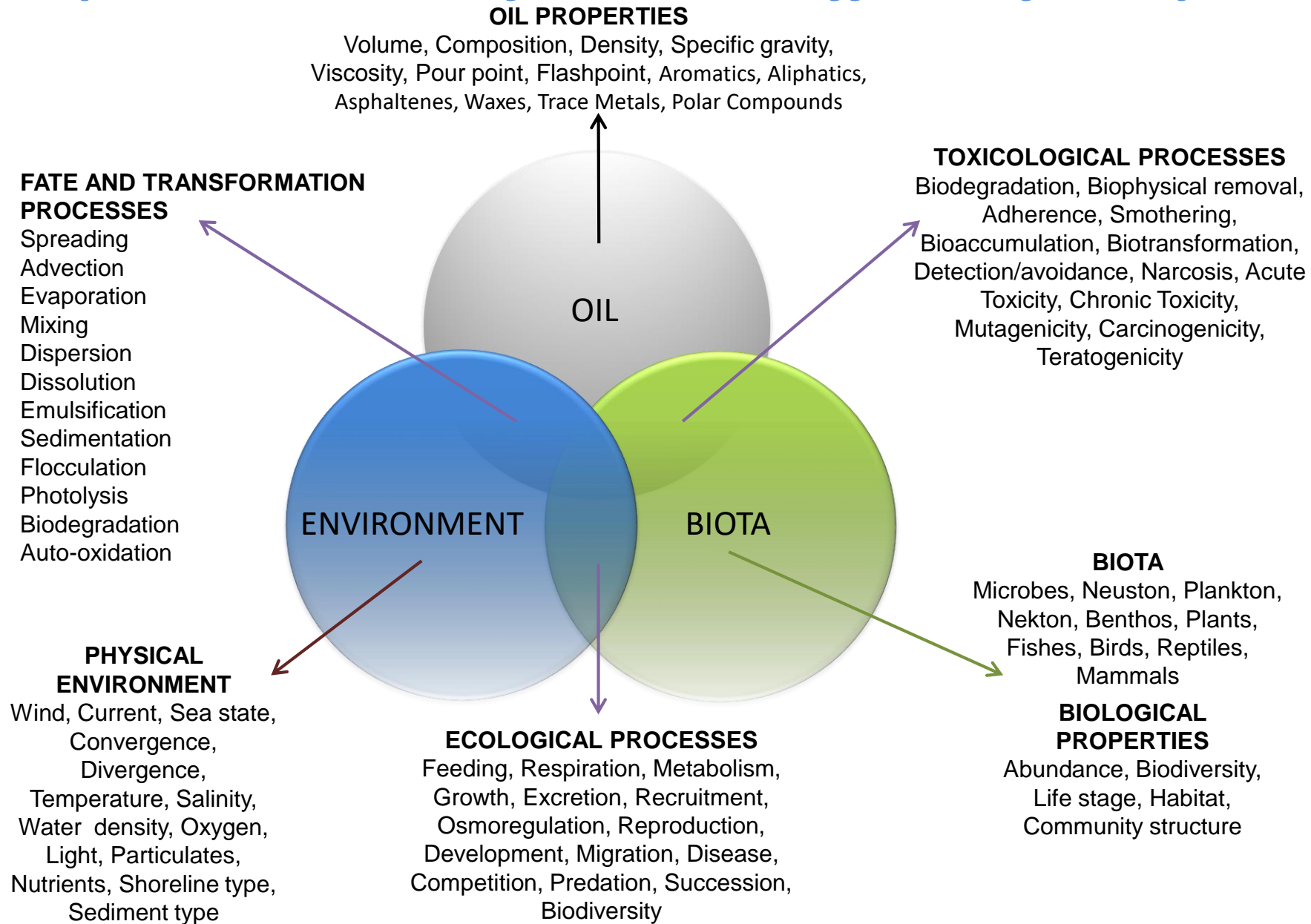
Identifies sites for protection and recommends procedures to minimize impacts from a spill and from response operations.

Provides critical input to the planning process and formulation of Incident Action Plans for Operations through field assessments, recommendations for treatment strategies, response monitoring, sampling and data management, and preparation of plans for activities requiring permits.

Response Activities

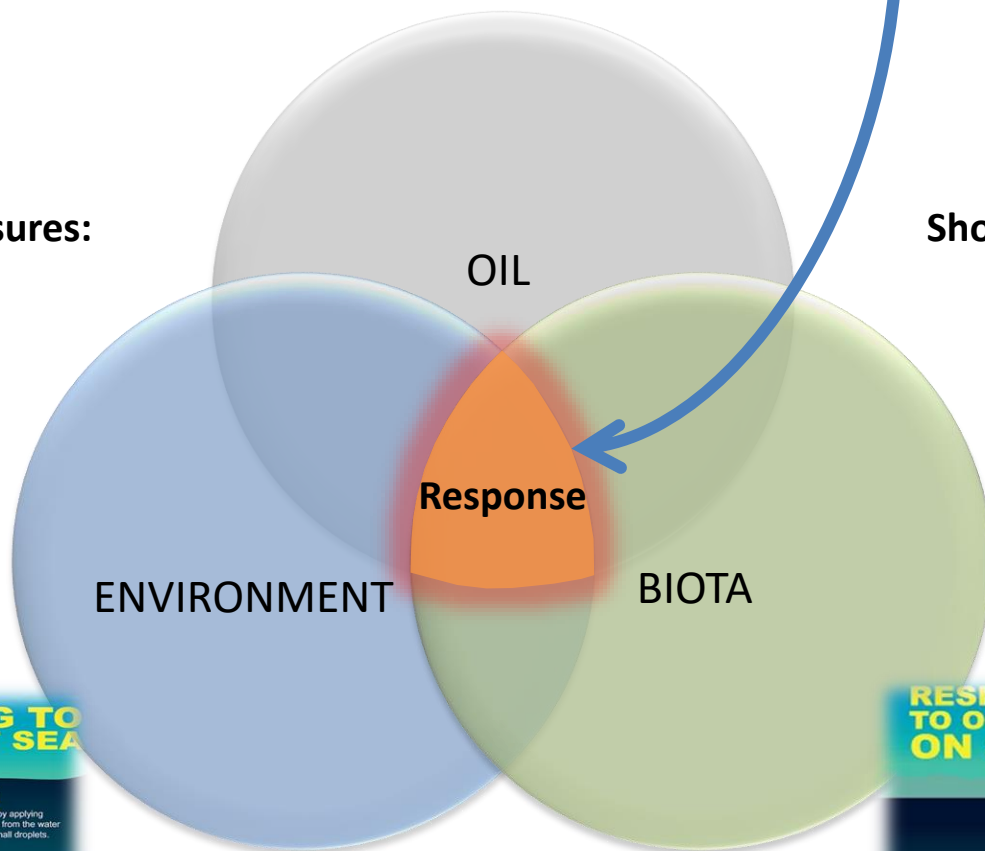


Transport, Fate, Transformation, Effects of Oil Spills





At the Intersections: Spill Response

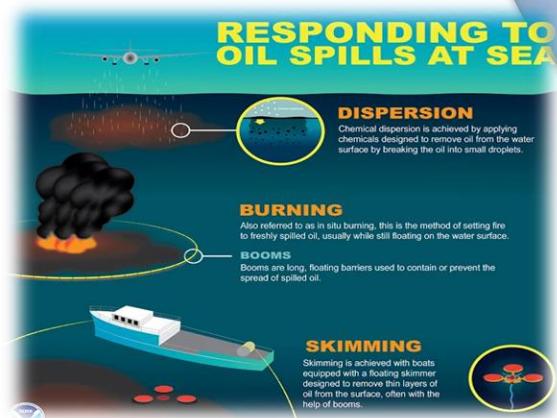


Open Water Countermeasures:

- Boom
- Skim
- Burn
- Disperse
- Etc.

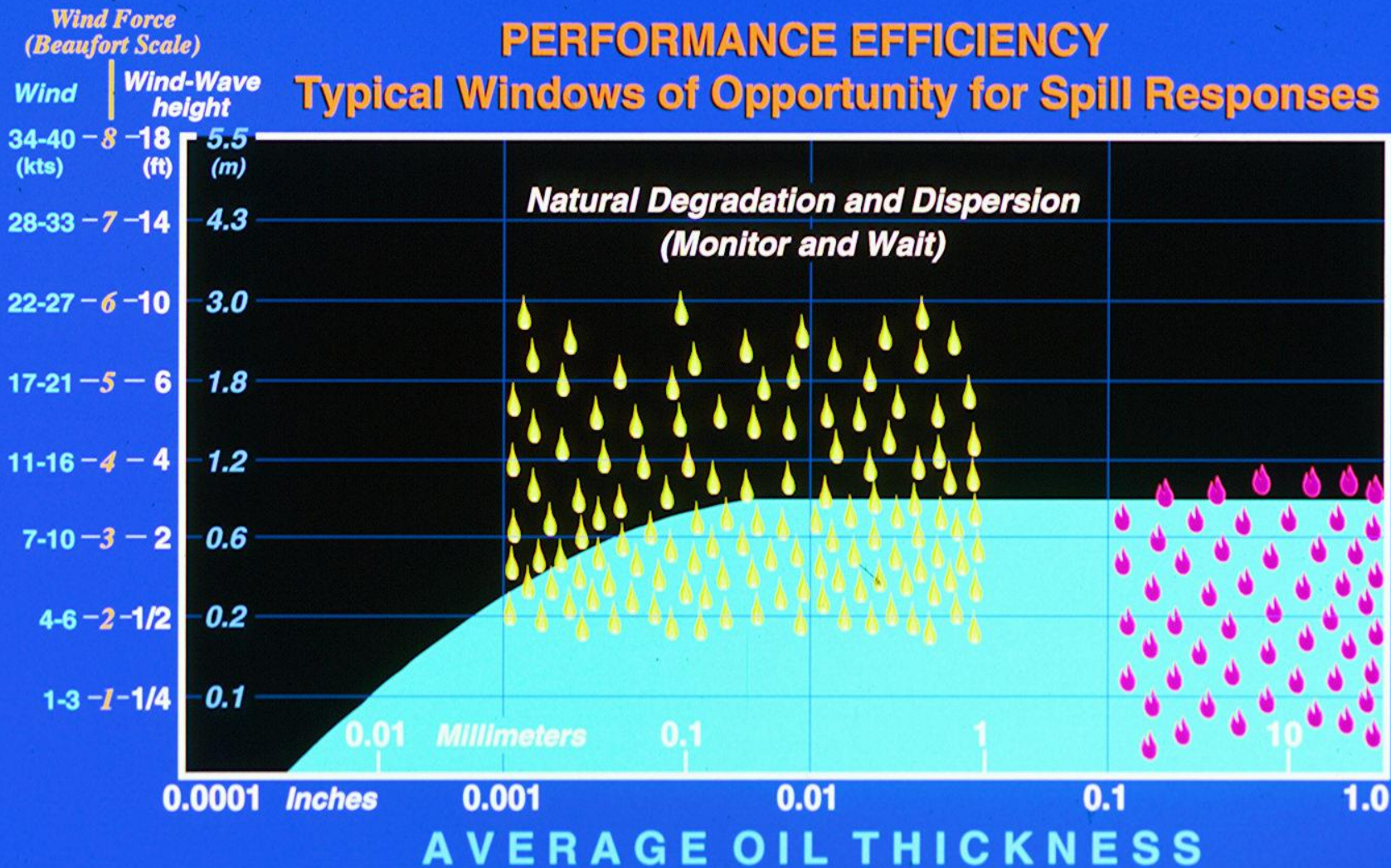
Shoreline Countermeasures:

- Manual
- Mechanical
- Washing
- Chemical
- Bioremediation
- Burn
- Etc.



PERFORMANCE EFFICIENCY

Typical Windows of Opportunity for Spill Responses



(after A.Allen)



Mechanical Clean-Up



Dispersants



Burning

T/V ATHOS I



Science Fueling Decision-making....

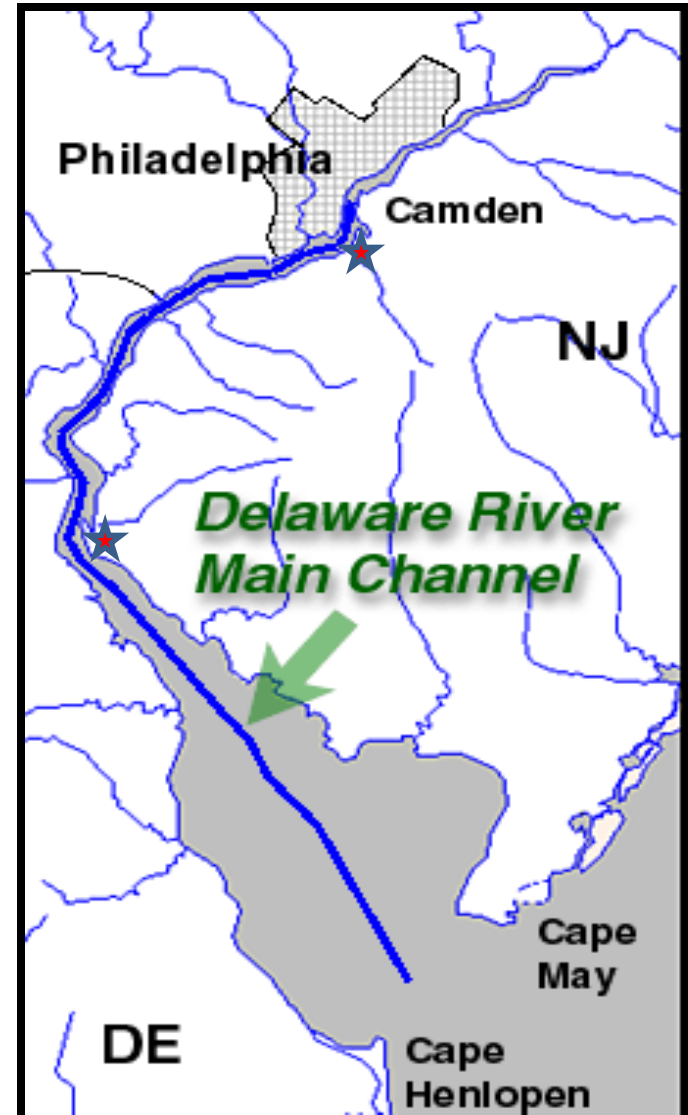
Area Information

COTP Philadelphia Statistics

- Approx 3,000 vessel arrivals/year
- 2nd largest petro-chemical port in the nation (largest for crude oil imports)
- Largest VLCC receiving port in nation
- 1 million barrels of crude oil imported daily
- Largest North American port for steel, paper, and meat imports
- Largest cocoa bean and fruit import port on east coast
- Port system generates \$19 billion in annual revenue

Home to:

- Five of the largest east coast refineries
- Six nuclear power plants
- Three states and two federal regions



**MV Athos I****HAZMAT Trajectory Analysis**

Estimate for: varies, 11/27-29/04

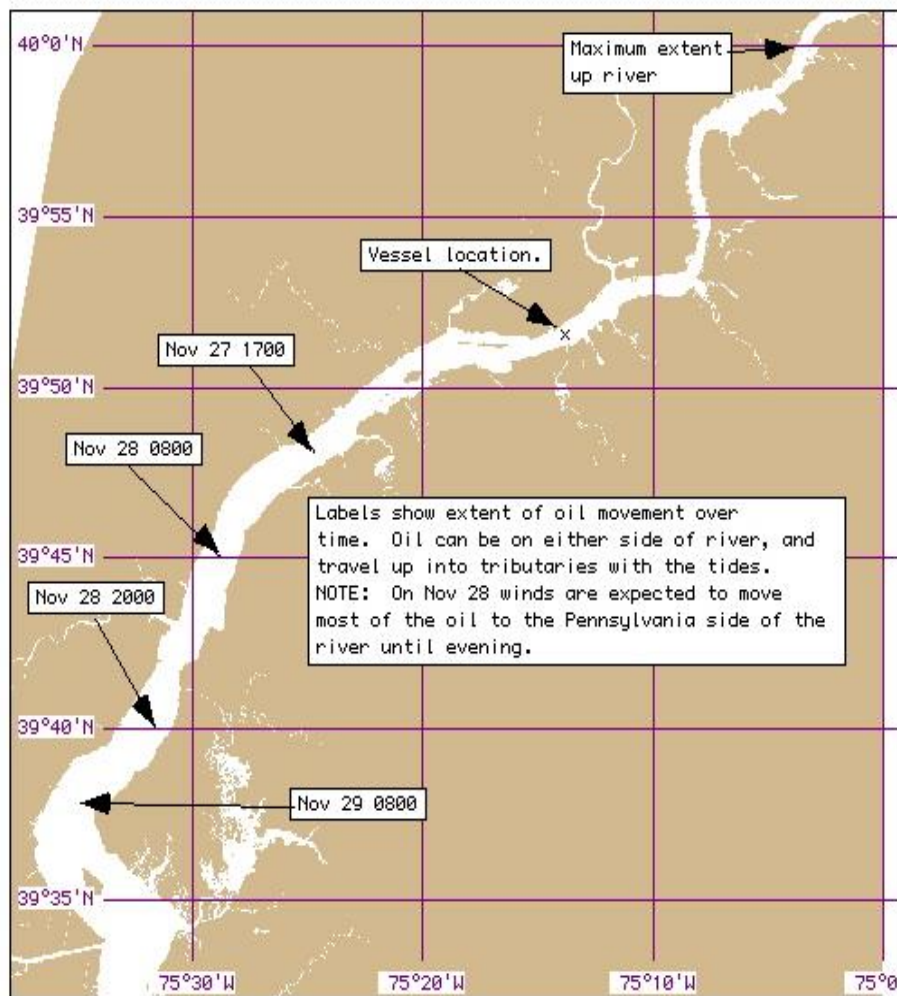
Prepared: 1307, 11/27/04

NOAA/HAZMAT (206) 526-4911



These estimates are based on the latest available information. Please refer to the trajectory analysis briefing and your Scientific Support Coordinator (SSC) for more complete information.

Estimates include knowledge of potential errors in the pollutant transport processes.

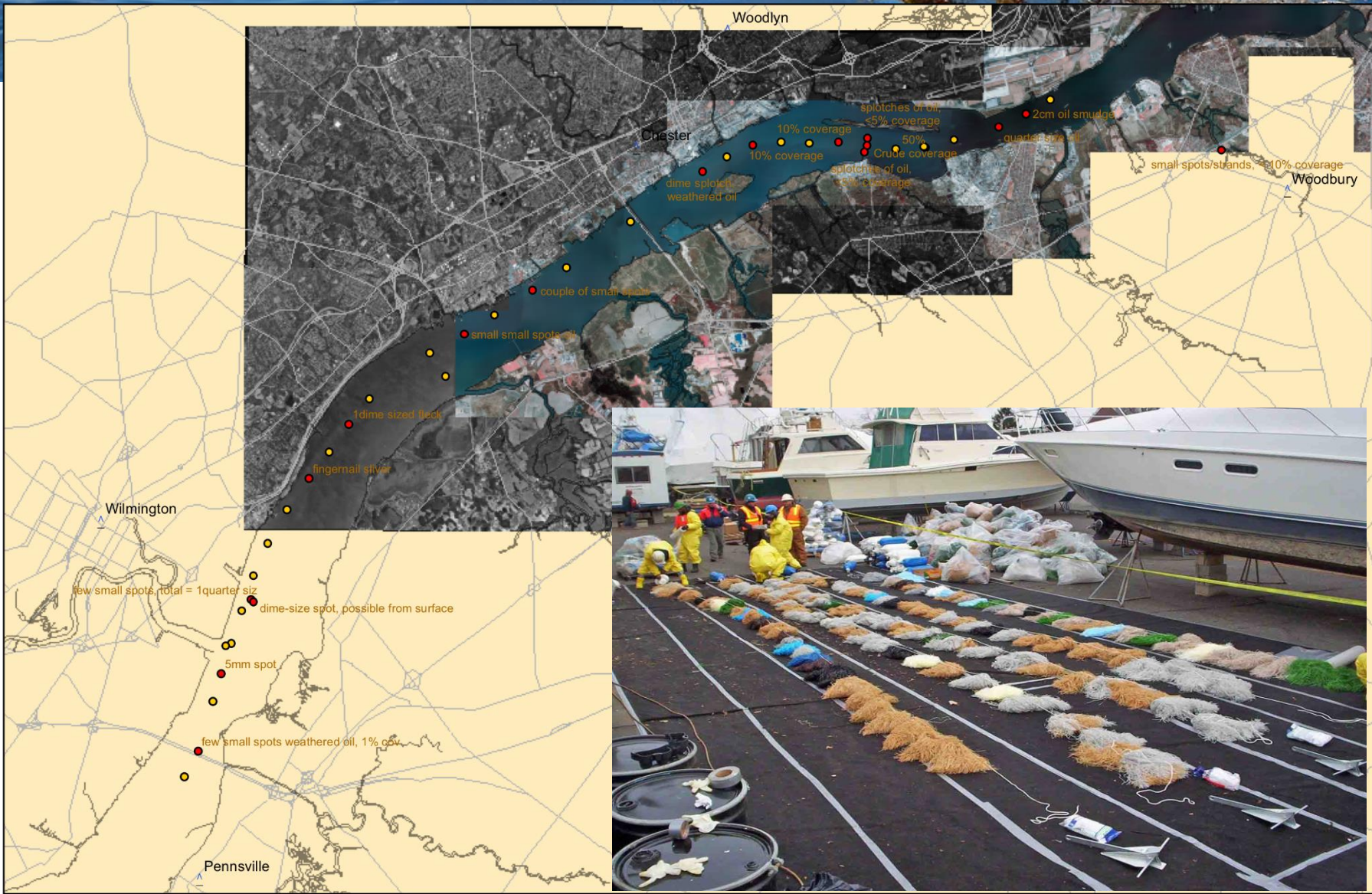


Initial Timeline

- 🔴 **26 Nov** 2130 hrs T/V ATHOS I 8 degree list to port reported
- 🔴 **27 Nov** Initial weather flat calm-oil observed on Delaware River
- 🔴 **28 Nov** Strong easterly winds drives oil against PA shore
- 🔴 **29 Nov** Overflight indicates significant oil has been released
- 🔴 **30 Nov** High level of response effort including shoreline assessment
- 🔴 **1 Dec** Strong westerly winds drives oil against NJ shore

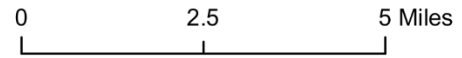


12/06/2004



Legend

- Oiled Pad
- Clean Pad



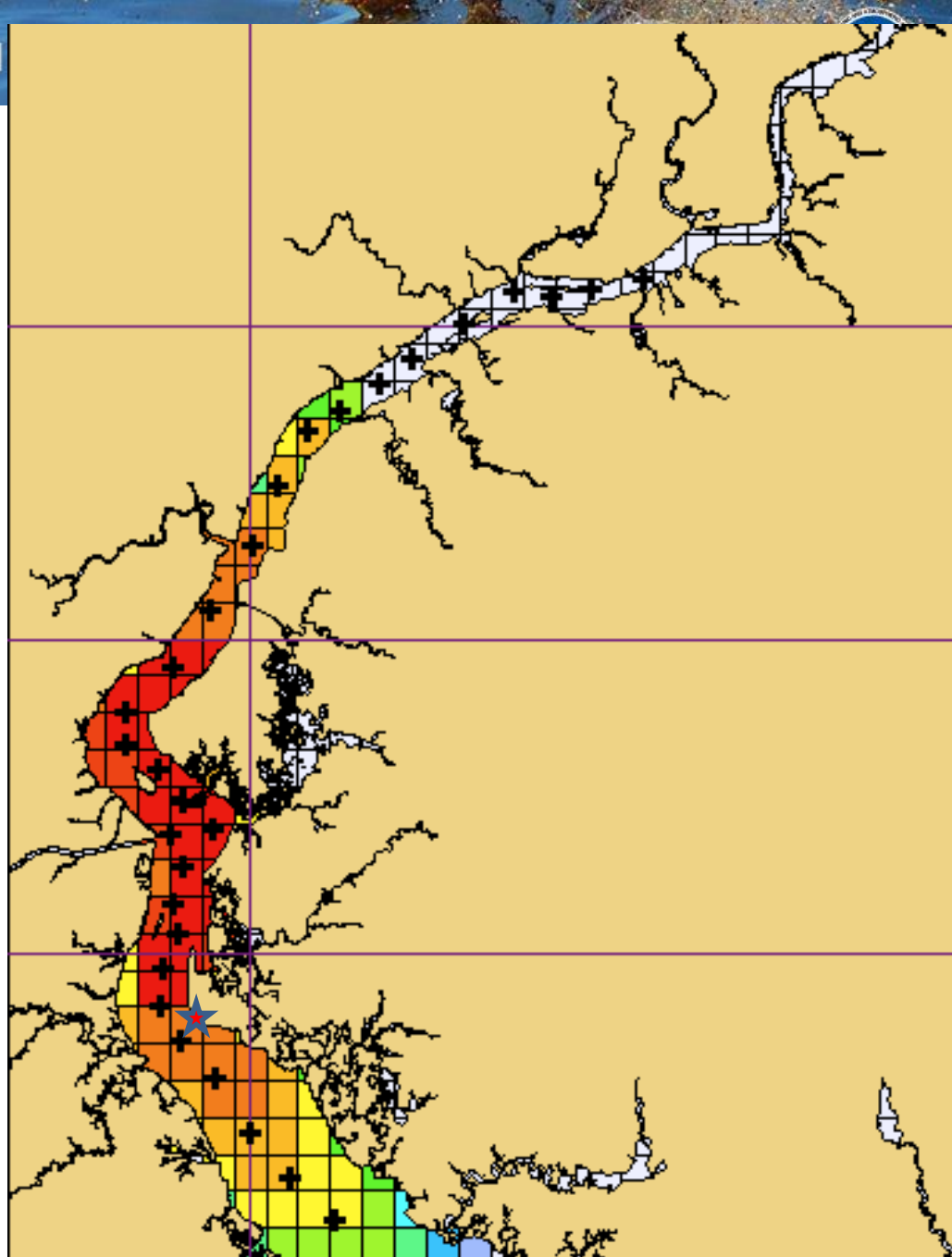
Absorbent Pad Drop Locations
DRAFT

Minimum transit
time for subsurface
oil to power plant
intake area

Red < 6 hours

Orange < 24 hours

Yellow < 48 hours





Who Else Might Be Affected By an Oil Spill? (Socio-Economic Effects)

- * Fishing industry
- * Resorts and recreation areas
- * Water supplies - drinking and industry
- * Etc., etc., etc.

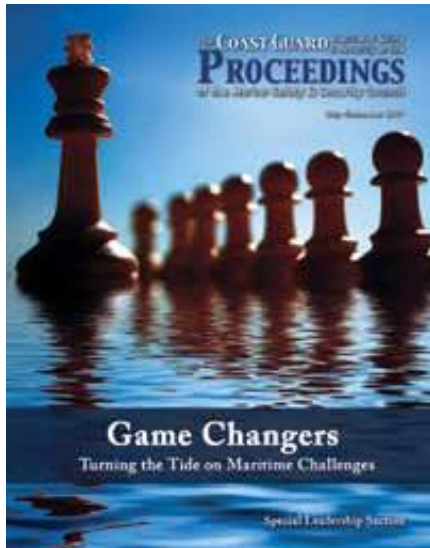


Integrating Science and Technology into Crisis Leadership

by Mr. Scott Lundgren, NOAA

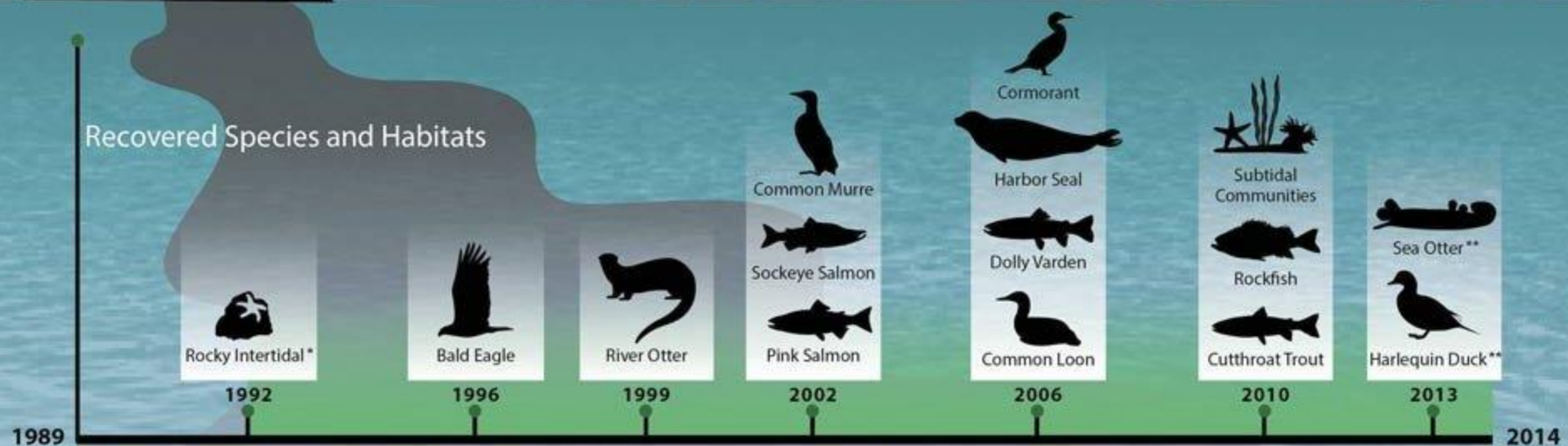
Response Research:

While response professionals may be skeptical of research conducted during incidents due to potential disruptions of response efforts, if it can be accommodated without interference, it is a principal way of advancing the state of response practice. Incidents are unique situations, and providing for site or data access on a non-interference basis with appropriate safety training and procedures will allow knowledge and understanding to progress. Access and information is most compelling for science needed with direct response applicability, and this area is also most likely to be funded by the response.





Post-Spill Science



* Data from NOAA
 ** Data from USGS
 Data were taken from the Exxon Valdez Oil Spill Trustee Council's 2010 Update on Injured Resources and Services (www.evostc.state.ak.us), U.S. Geological Survey, and National Oceanic and Atmospheric Administration's Office of Response and Restoration. This infographic was produced by the National Oceanic and Atmospheric Administration.



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