



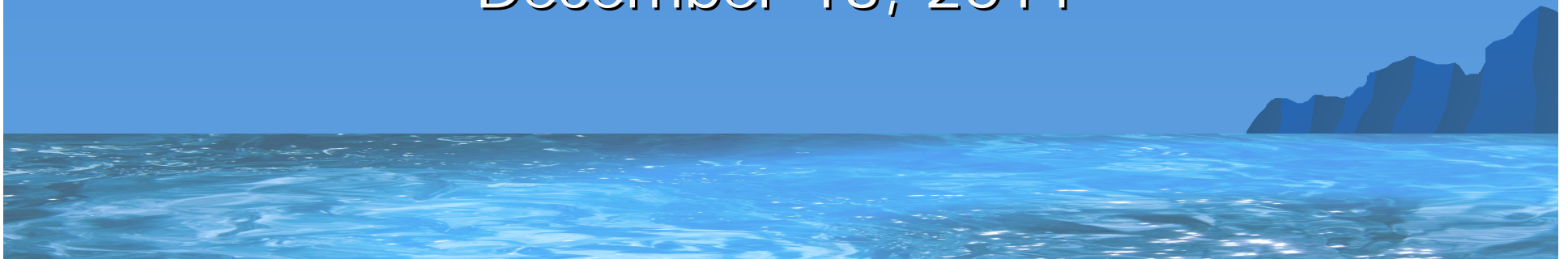
Oil Spill Research and Oil Spill Modeling

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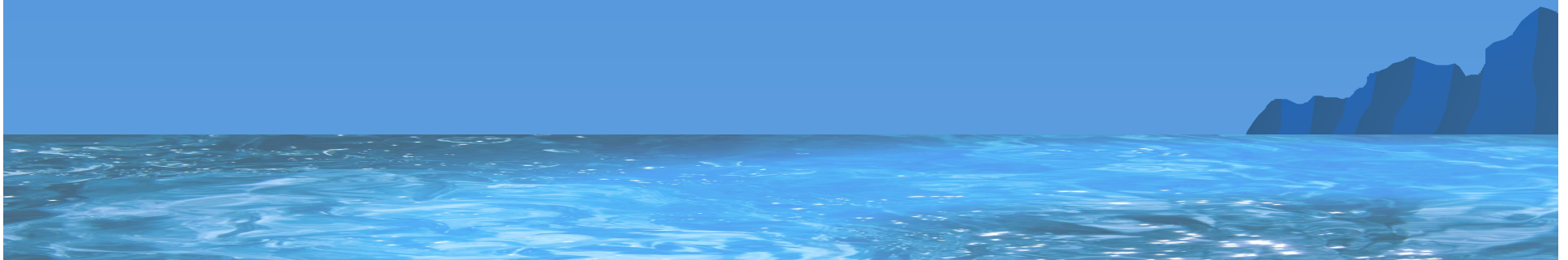
Division of Environmental Sciences

December 13, 2011



Environmental Studies Program

- ◆ Develops and oversees applied scientific studies required for making responsible decisions for managing energy and marine mineral resources on the U.S. Outer Continental Shelf





Oil Spill Research Programs

Ohmsett: Oil Spill Response and Renewable Energy Facility

667 feet long
65 feet wide
8 feet deep



2.6 million gallons of water

Tow bridge speeds 6.5 knots max.

Ohmsett
Oil Spill Response
Renewable Energy Facility

NEW JERSEY

NEW YORK

New York City

Newark



JFK



LaGuardia


Ohmsett



Ohmsett
Oil Spill Response Research &
Renewable Energy Facility

Types of Activities at Ohmsett

- Testing response equipment and oil spill clean up technology
- Training in oil spill response technology (English and Spanish classes)
- Testing renewable energy wave equipment
- Develop testing protocol



Development of a Portable Aerial Thickness Sensor



Ocean Imaging Corp.

Cal Fish & Game

Objective: Develop a portable aerial sensor to map the thickness & distribution of spilled oil.

Three Options for Oil Spill Response For Arctic Environments

- Mechanical Containment and Recovery
- In Situ Burning of Oil
- Chemical Dispersants



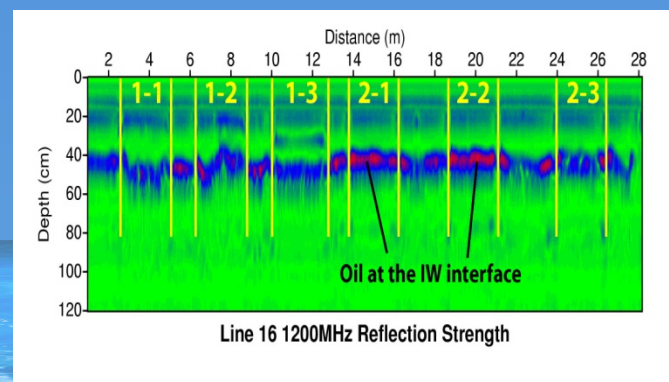
Remote Detection of Oil in and Under Ice

November 2004 - Successful test program with ground penetrating radar detecting crude oil under 40 cm ice in CRREL test tank

April 2005 - Successful Prudhoe Bay, AK radar trials in 2 meters ice, -20°C (April 2005) - no oil

March 2006 – Intentional oil spill at Spitsbergen, Norway to test airborne ground penetrating radar, ethane flux, and acoustics (3,500 liters of crude oil were used)

Phase 2 Funding Partners (8) MMS, ADEC, ACS, Statoil, Shell Technology, ConocoPhillips Canada, ExxonMobil, Store Norske Spitsbergen Kulkompani



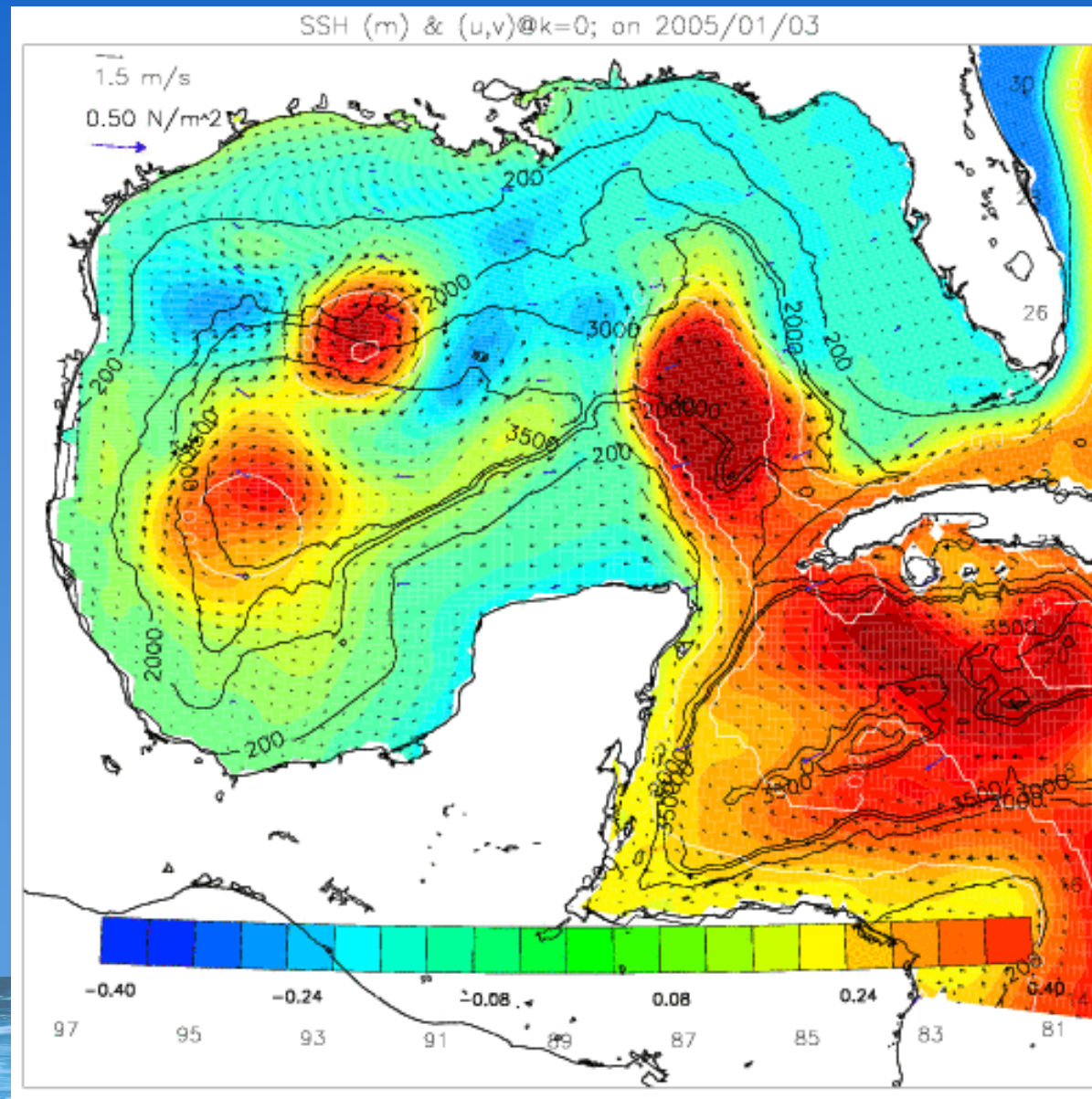


Oil Spill Research Program

- ◆ Physical Oceanography and Meteorology Studies
- ◆ Fate and Effects Studies of Oil Spills
- ◆ Ocean Circulation Modeling
- ◆ Remote Sensing of Ocean Properties



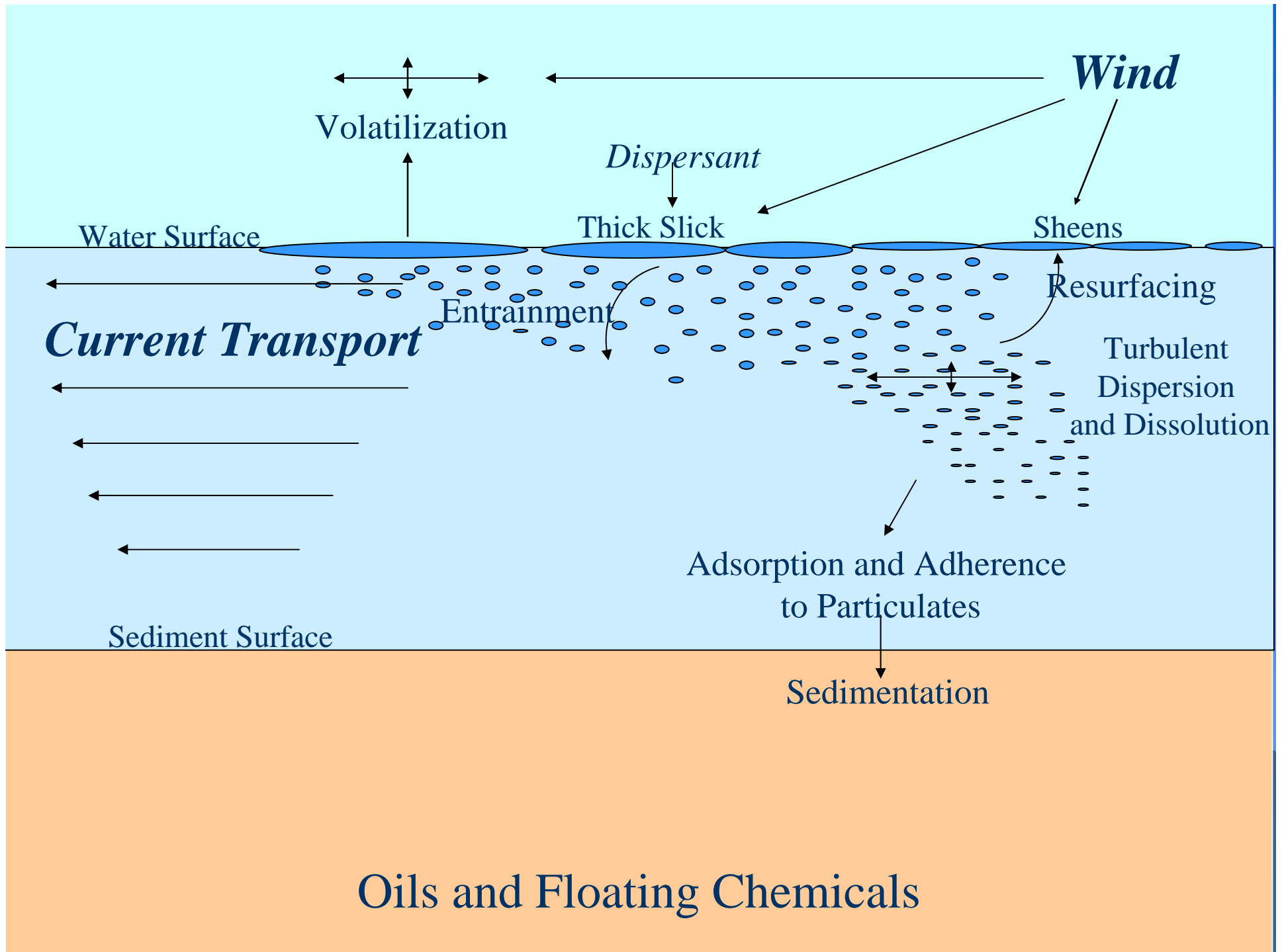
Princeton Ocean Model sub-domain



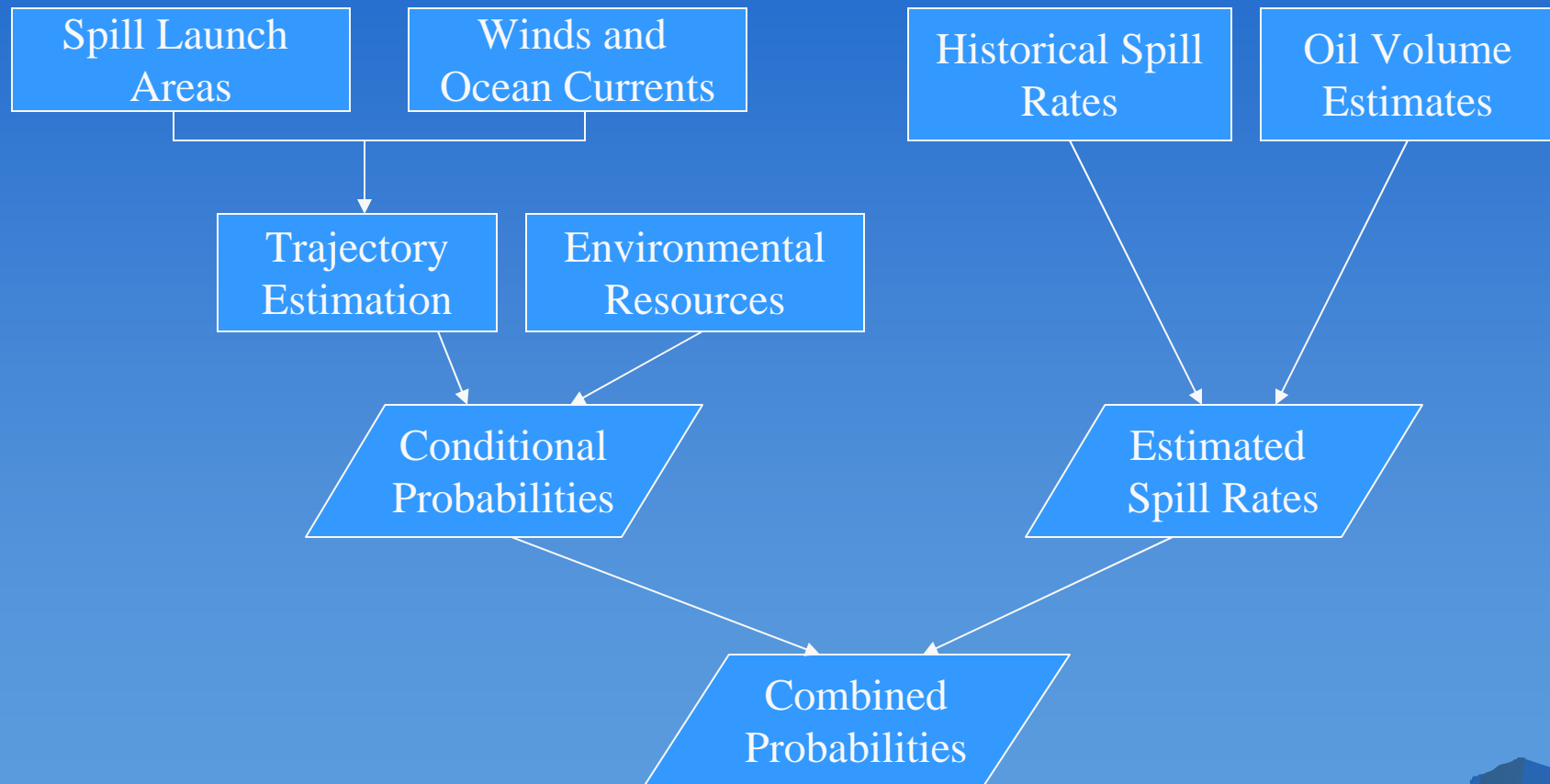


Oil Spill Modeling Program

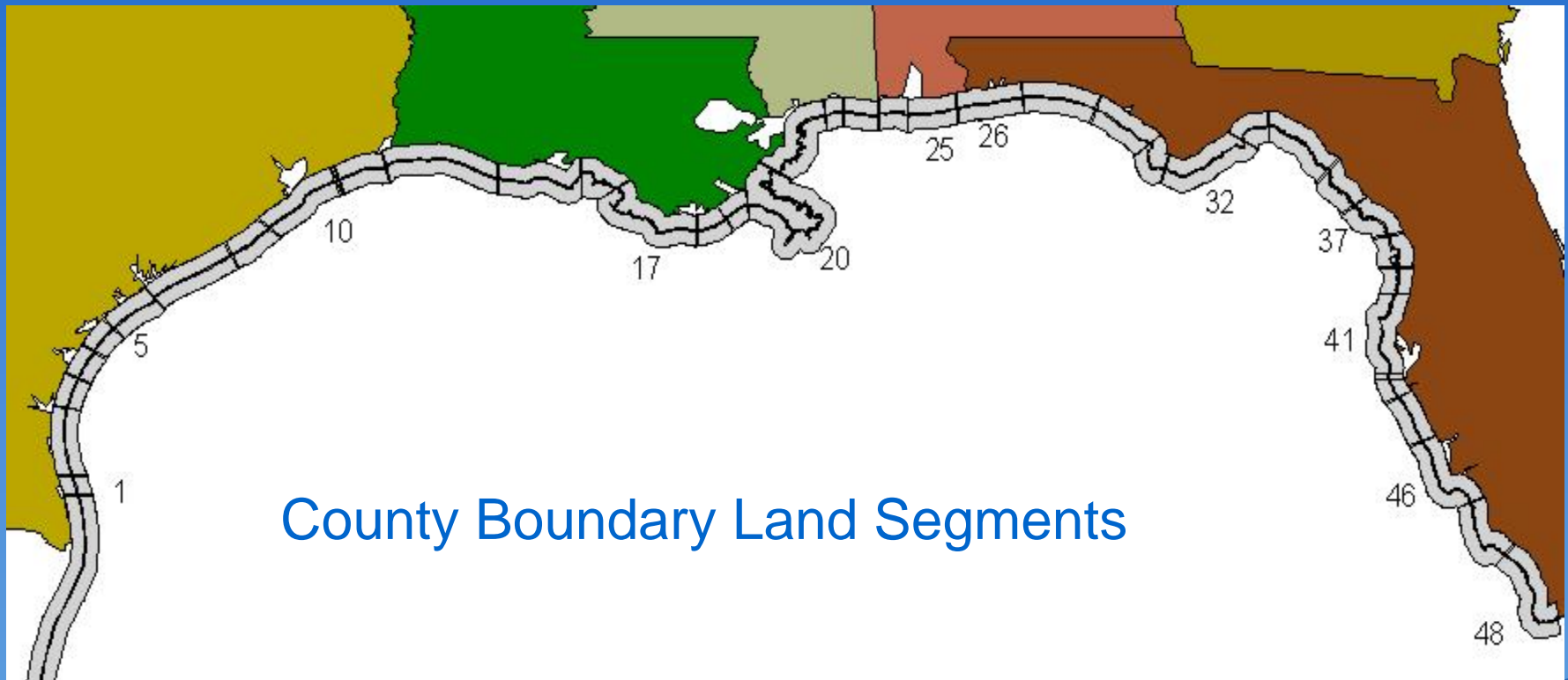
- ◆ Bureau-wide Modeling of hypothetical Oil Spills: the OSRA model
- ◆ Uses the results of Physical Oceanography and Meteorology Studies and Ocean Circulation Modeling



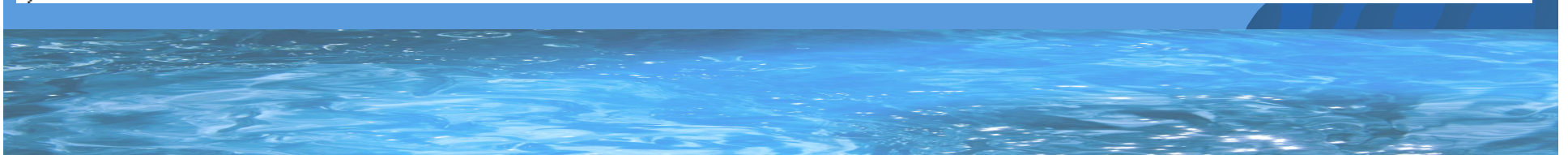
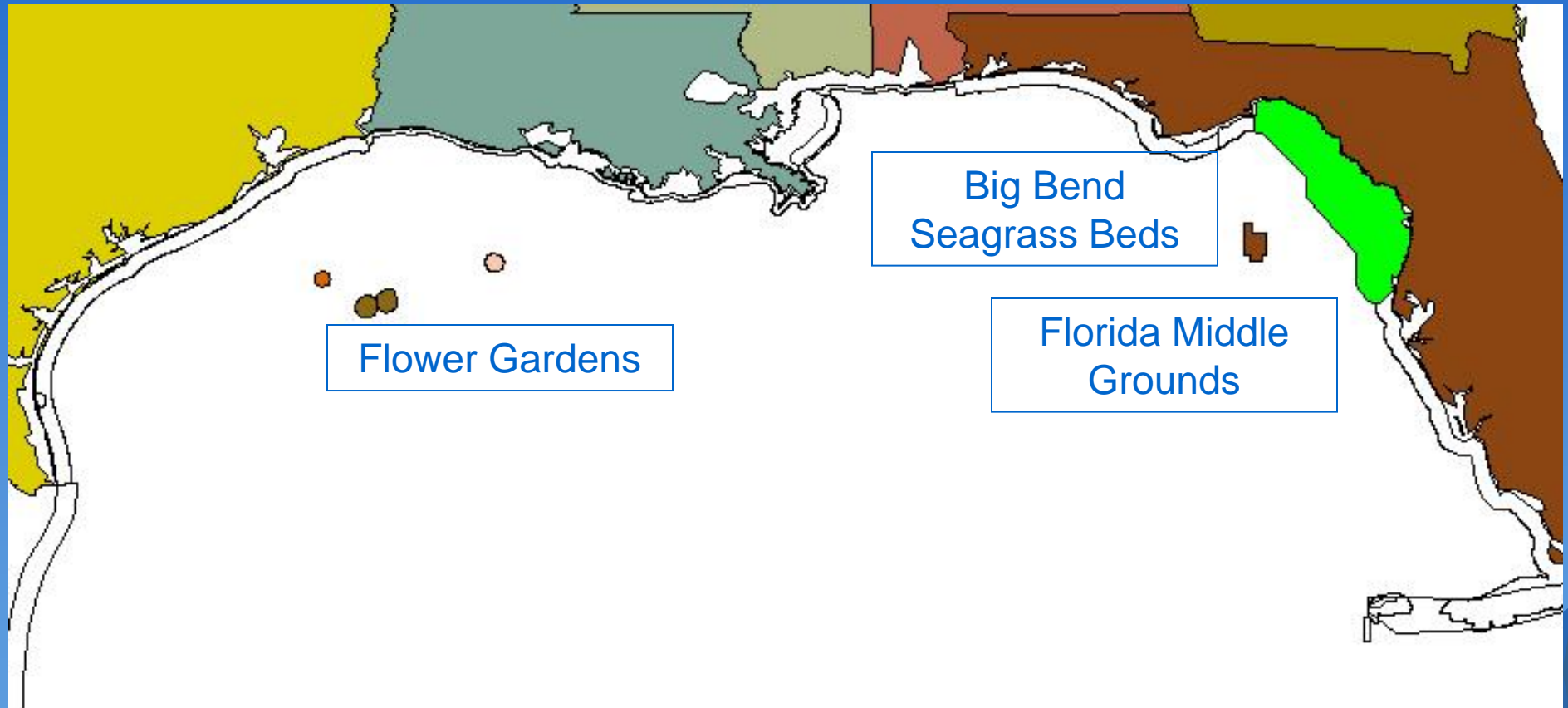
OSRA Process



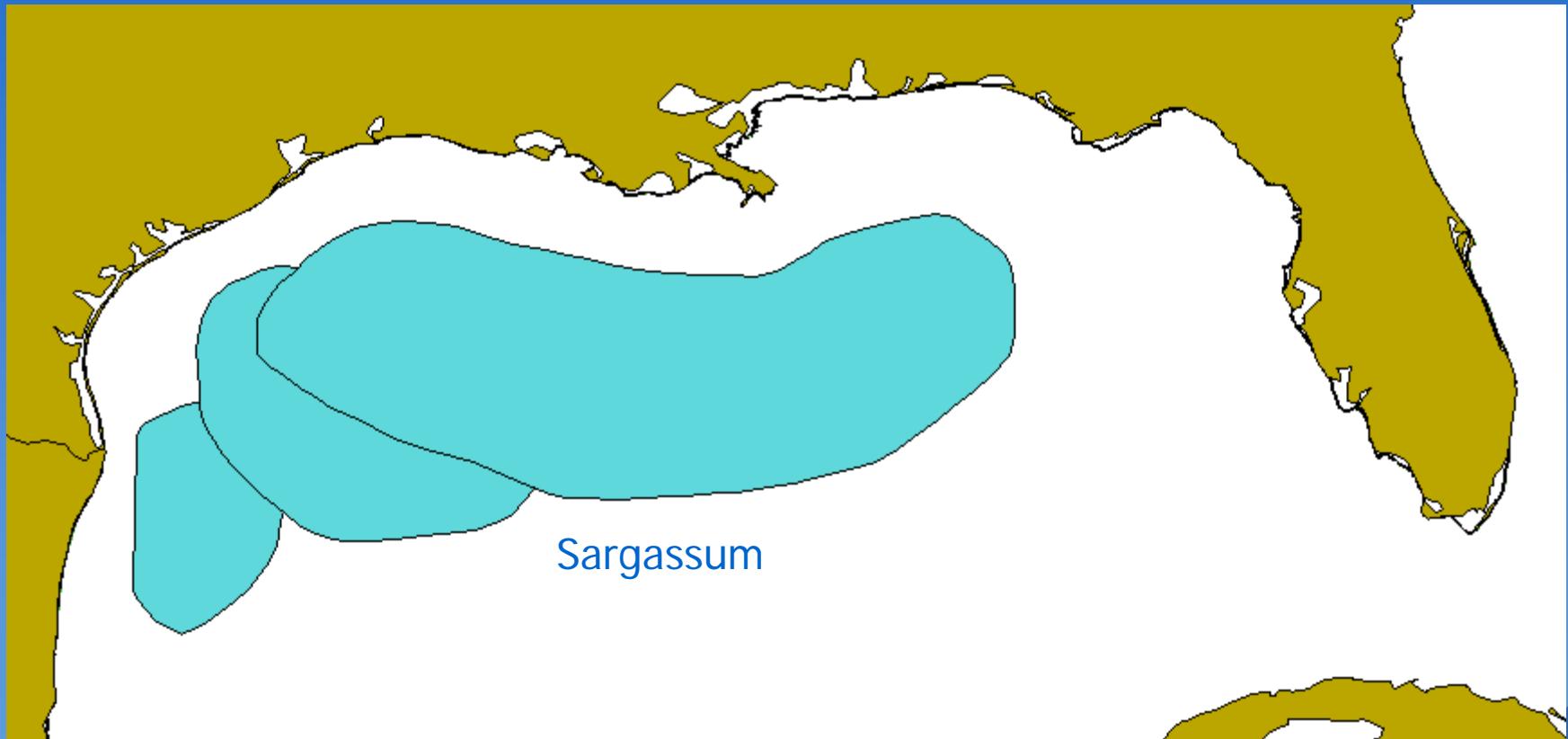
Gulf of Mexico County Land Segments



Gulf of Mexico Environmental Resources



Gulf of Mexico Environmental Resources



Gulf of Mexico Example

GNOME™ 1.3.3

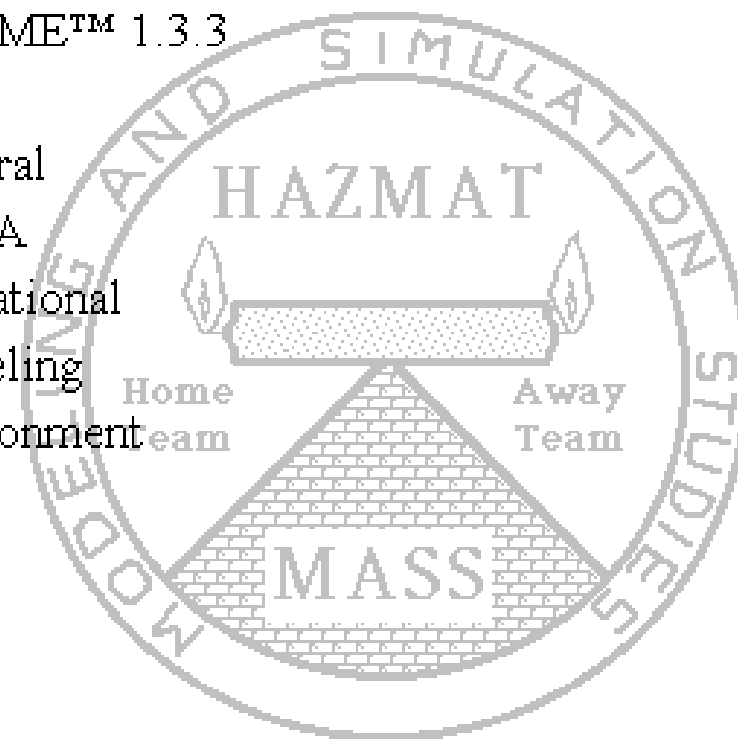
General

NOAA

Operational

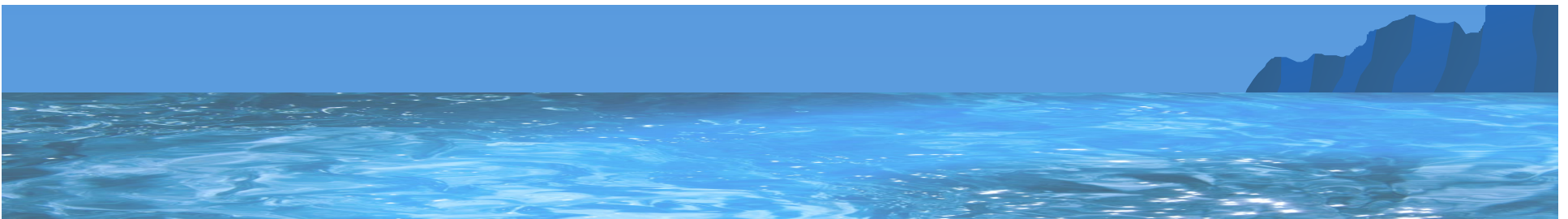
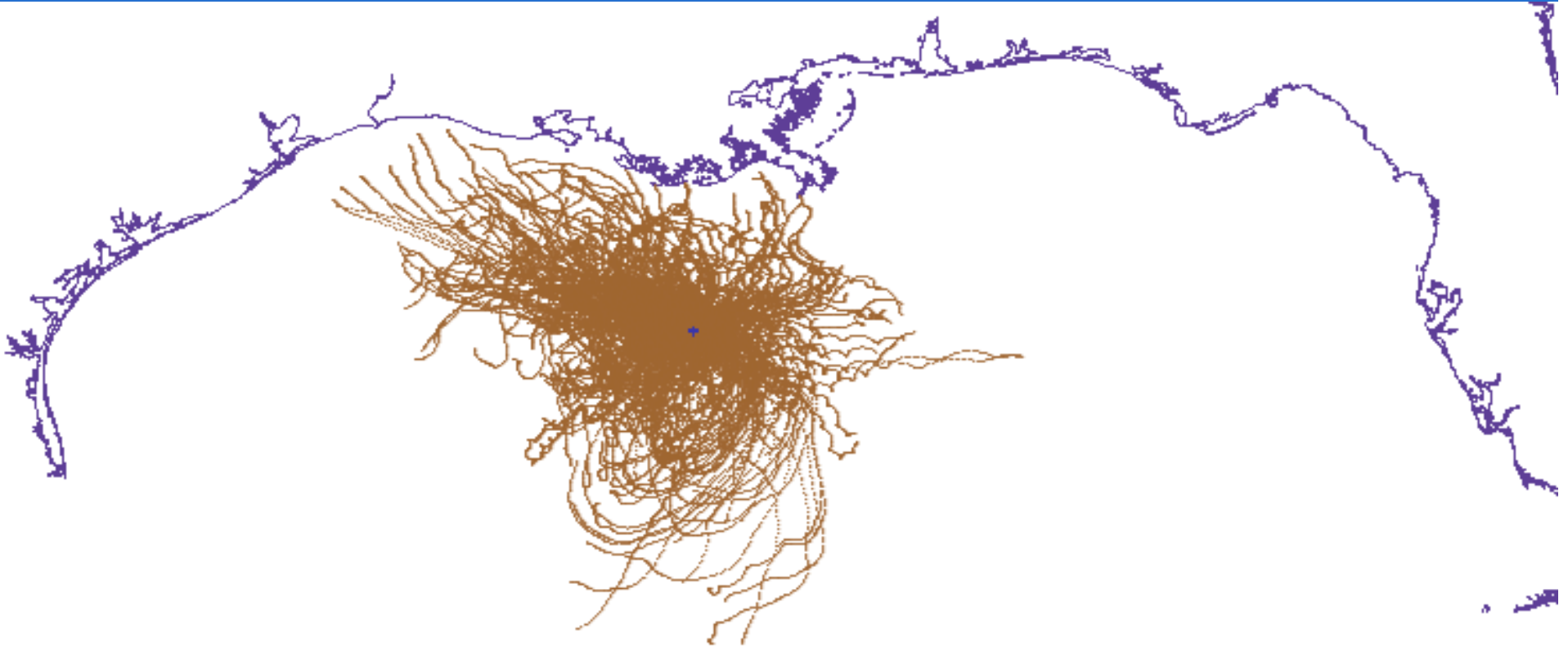
Modeling

Environment



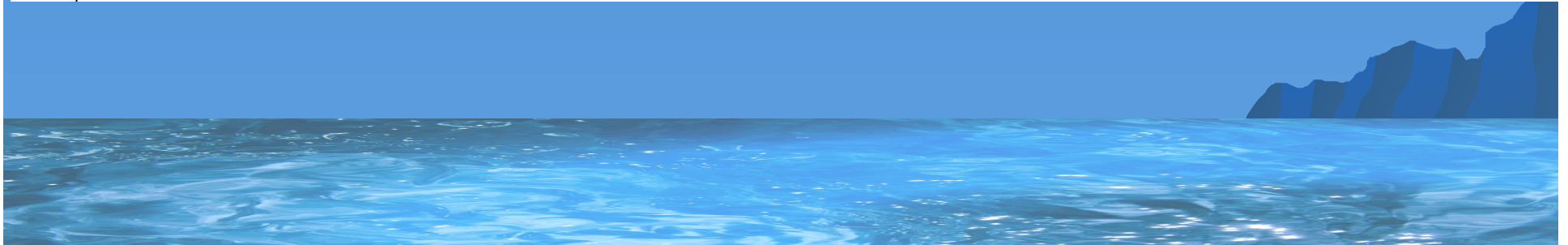
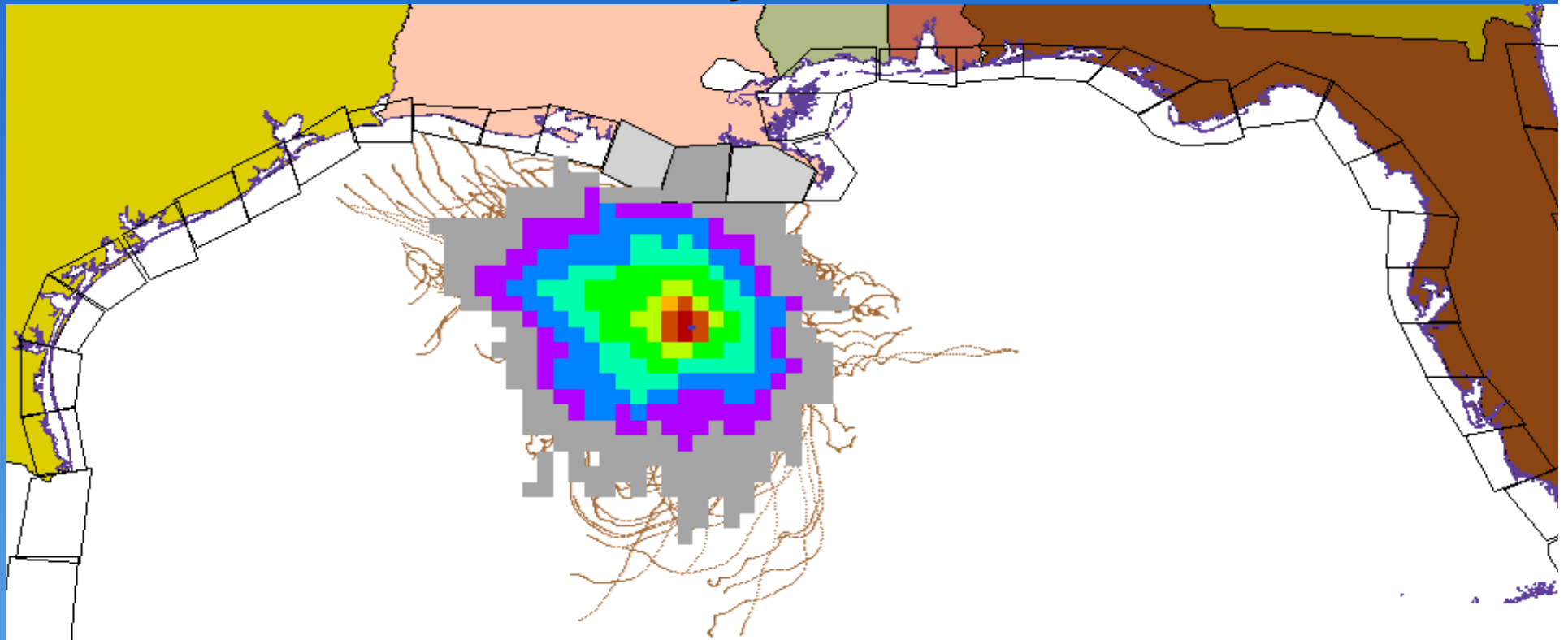
OSRA Trajectories

1993, 10 days travel time

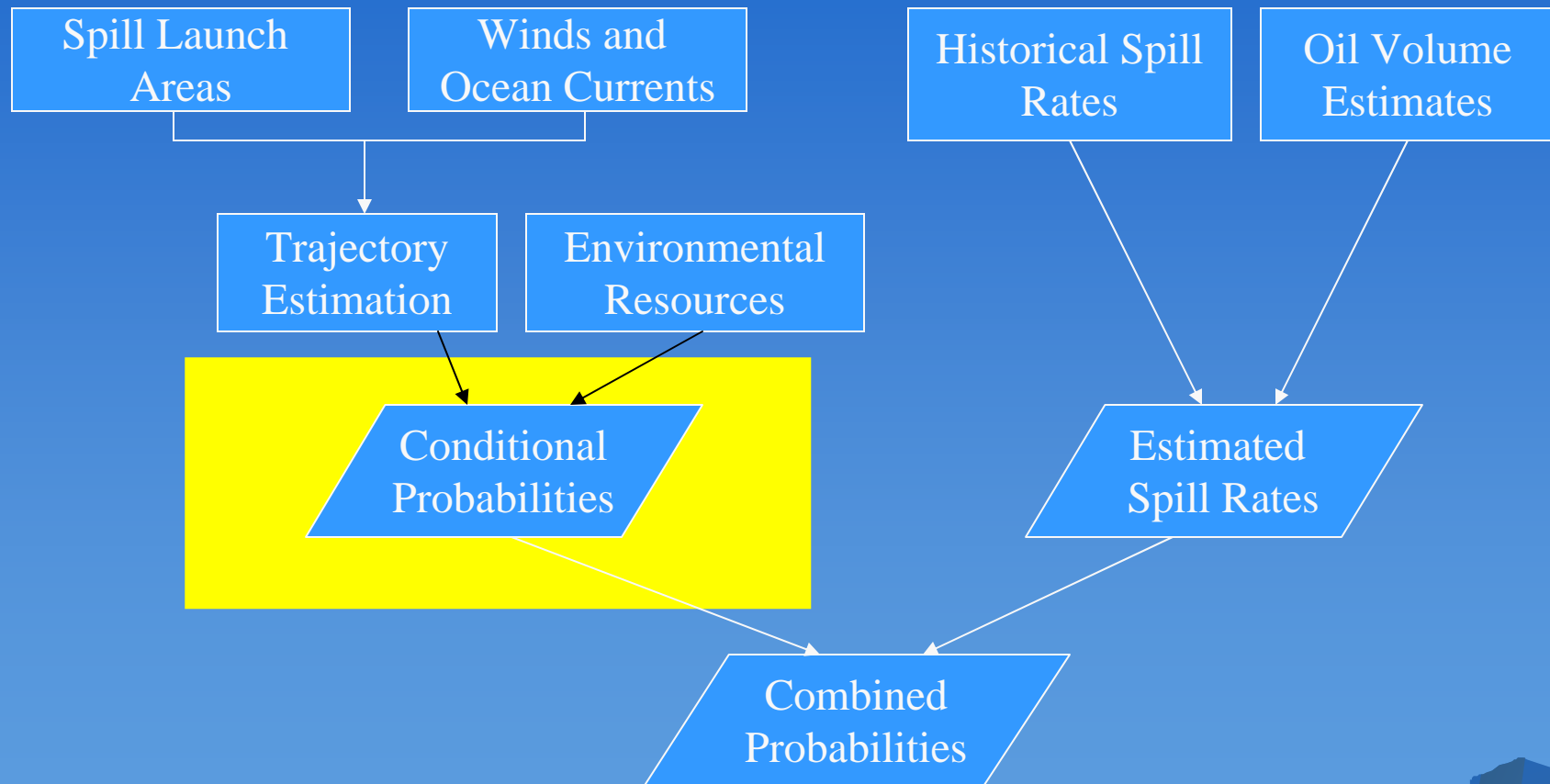


OSRA Trajectory Probabilities

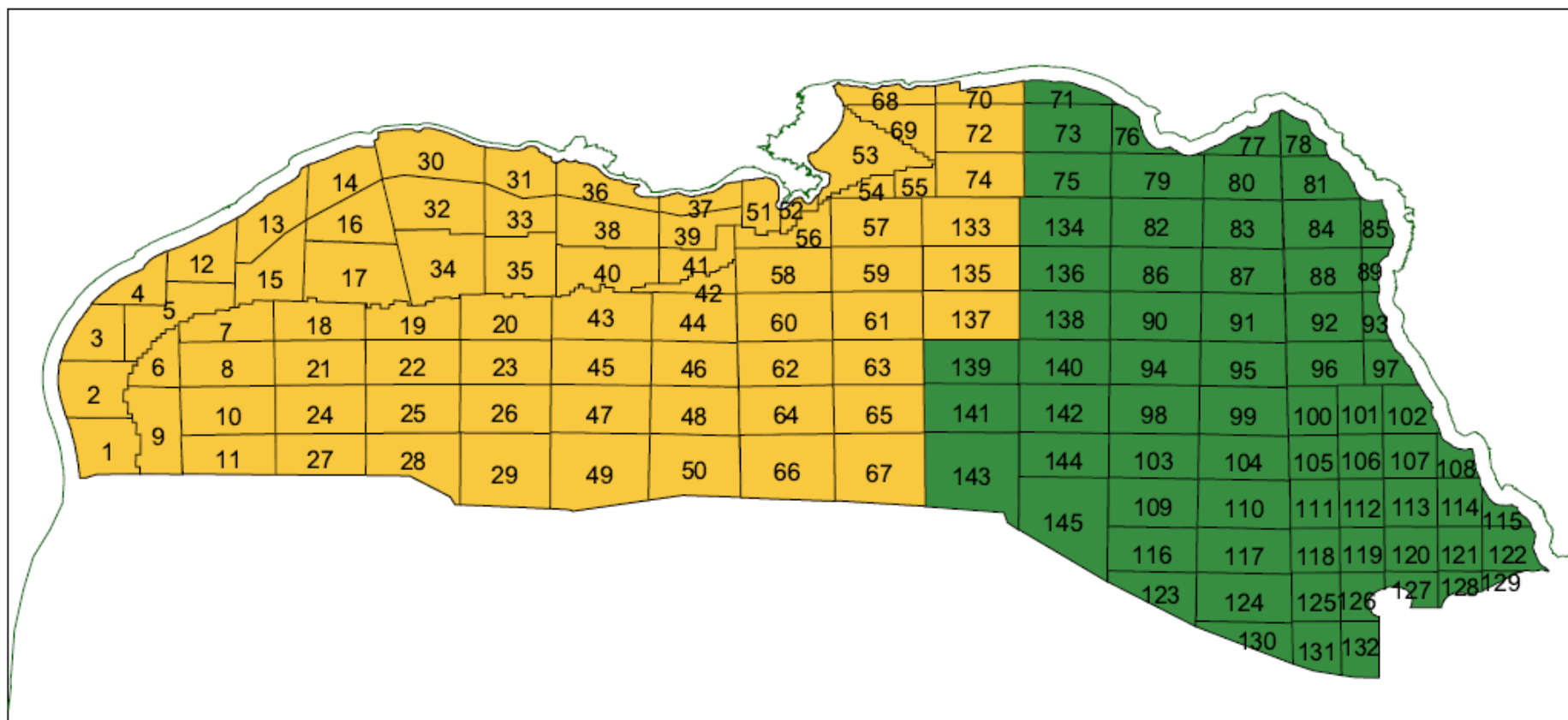
1993, 10 day travel time



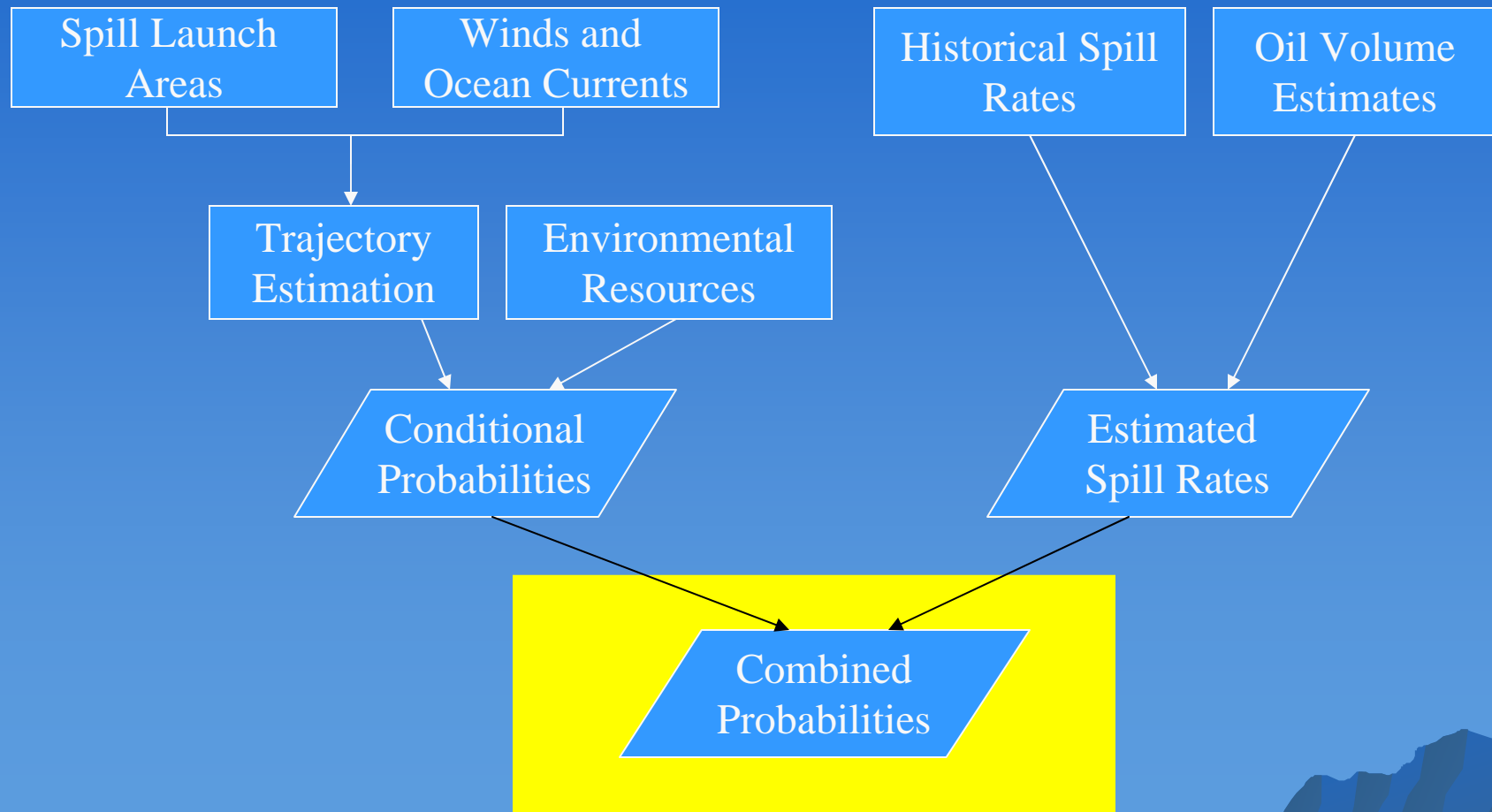
OSRA Process



OSRP Conditional Probability Areas



OSRA Process



Environmental Studies Program

BOEM

BUREAU OF OCEAN ENERGY MANAGEMENT

