The Deepwater Horizon Oil Spill NRDA

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Separate Procedures for Oil Spills

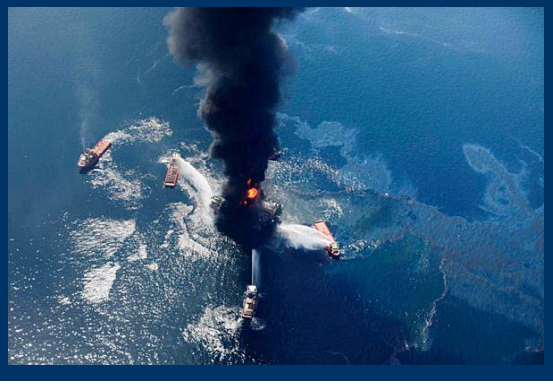
- Response – in accordance to regulations
  - Objectives: to control the release and minimize the impact of the spill
  - Responsible party pays and performs much of the effort
  - Government oversight

    USCG in charge (Federal On-Scene Coordinator, FOSC)

    Advice from federal and state agencies with varying responsibilities (coordinated by NOAA OR&R Scientific Support Coordinator, SSC)
- Natural Resource Damage Assessment (NRDA)
  - US Law: Oil Pollution Act of 1990 (OPA) procedures
- Penalties
- Private claims

Objective of a NRDA

- Restore injured public trust resources to compensate for public losses
- Claim
  - Injuries = Impacts = Interim losses of resource services (ecological and human use)
  - Damages ($)
    - Preferably, the cost of restoration
    - Economic value of resource injuries
  - (Reasonable) Assessment costs



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Who's Who for DWHOS NRDA

- Trustees = Government agencies with responsibilities to protect natural resources
  - NOAA Office of Response and Restoration (ORR) Assessment Restoration Division (ARD)
    - Fish and other water column biota
    - Benthic and wetland biota
    - Marine mammals
    - Sea turtles

  - US Fish and Wildlife Service – birds and sea turtles
  - National Park Service – natural resources in and using parklands
  - States – all resources in and using state waters (LA, MS, AL, FL, TX)

OPA Procedures

- Trustees must invite RP to cooperate
  - If cooperative, Trustees lead
    - RP agrees to pay assessment costs up-front (but not a blank check)
    - Technical Working Groups ("TWGs") set up for each resource category to evaluate injuries and potential restoration alternatives
    - TWGs develop work plans
      - If RP agrees to the plan, cooperative (so RP pays costs up-front)
      - If RP does not agree, trustees (government) must bear costs until (and if) recovered during settlement or in court
  - If not cooperative, government bears all costs until recover damages

Technical Working Groups (TWGs)

- Offshore and Shelf
  - Water Column and Modeling
  - Fish and Plankton
  - Deep Sea Benthic Communities
- Nearshore habitats and communities
  - Shallow water habitats
  - Oyster Reefs
  - SAV
  - Shallow coral reefs

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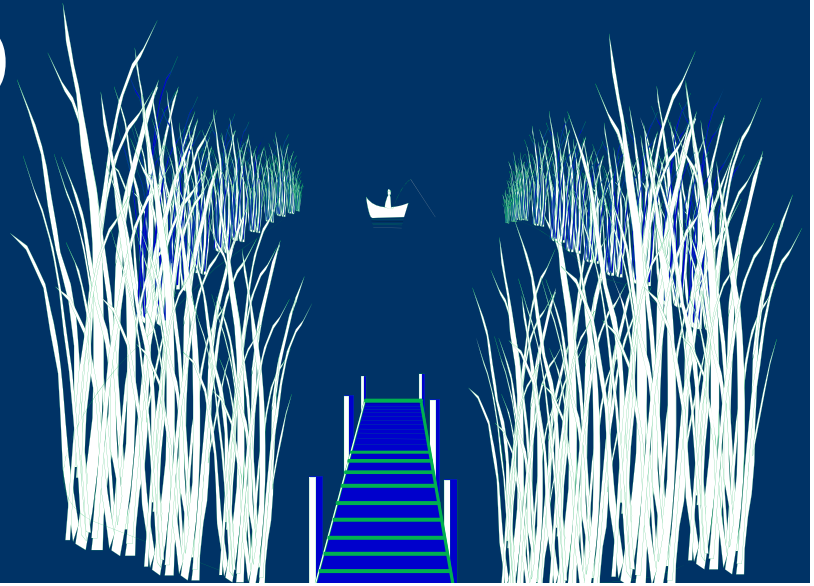
Technical Working Groups (TWGs)

- On shore habitat and communities plus selected species groups
  - Mammals
  - Turtles
  - Shoreline
  - Birds
  - Terrestrial mammals and invertebrates
- Economics (the “Damages”)
- Restoration



Technical Working Groups (TWGs)

- Case Support
  - Chemistry
  - Data Management
  - Information Management
  - Telemetry
  - Toxicity
- NRDA Representation
  - On-site NRDA Lead
  - Trustee council
  - Outreach

Case Experts

- Legal process, may go to Court
- Trustees and RP (BP) each designate Experts
  - Experts are PhDs with demonstrable experience in the field of expertise – in court expertise typically challenged/established through pre-trial Daubert hearing
  - Experts will produce technical reports, publications, testify
- Trustee process for designating Experts
  - Selected by TWG leads
  - Vetted by agency management and lawyers
  - Agree to confidentiality re case development
  - Contracted by NOAA via prime contractors
- RP also has experts and consultants: Cardno ENTRIX lead; CSA, Exponent, Integral, ERM

General TWG Activities

- Meetings (usually calls)
  - Formal calls with all trustee and RP reps
    - First few months : 3 calls/week
    - Now : 1 call/week
  - Informal calls with trustee and RP reps
  - Management calls and meetings
  - Trustee-only calls
- Develop conceptual models for pathway, exposure, injuries
- Develop work plans
  - Cruise plans
  - Data analysis plans

Offshore and Shelf TWG : Water Column Activities

- Modeling
  - Hydrodynamics
  - Oil fates and biological effects
- Cruises
  - 14 cooperative cruises in 2010 to sample water
    CTD, DO and fluorescence
    Chemistry [Hydrocarbons, nutrients, etc.]
    Oil droplet sizes and densities, particulates
  - 2011:
    Seep evaluations
- Data analysis – just beginning

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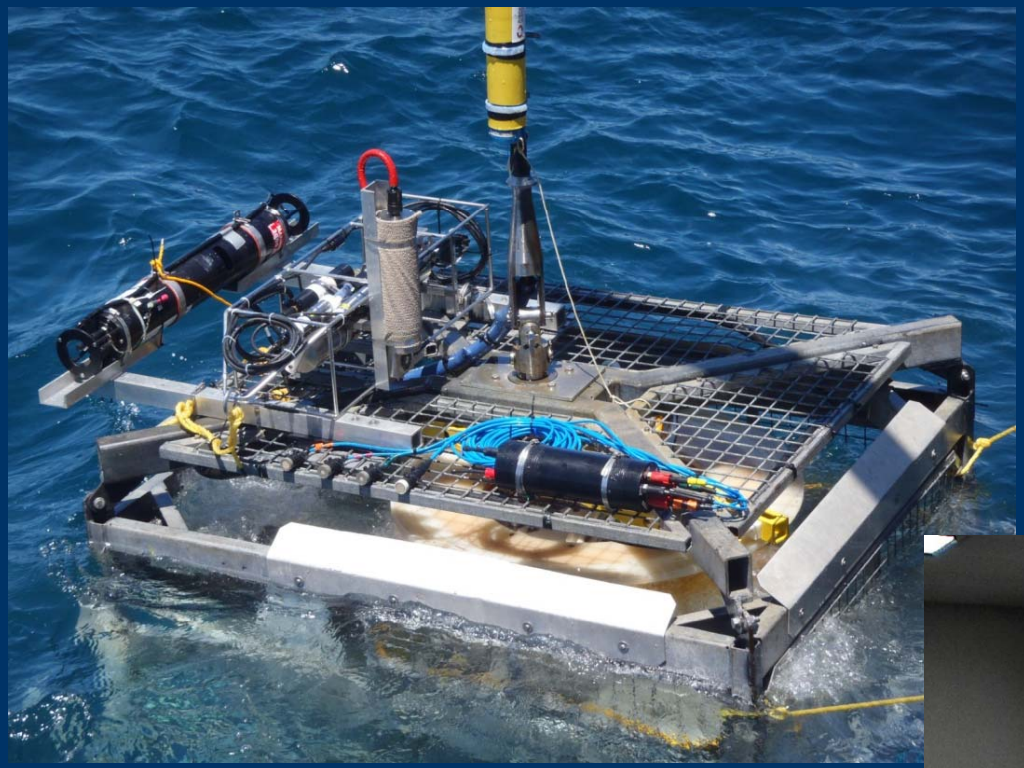
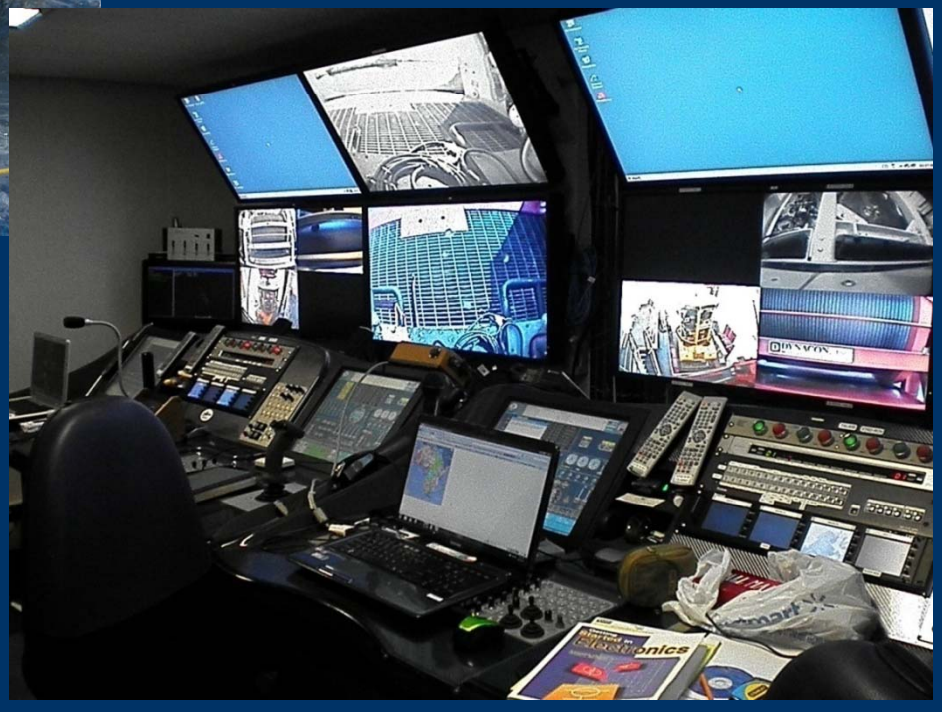
ROV Deployment





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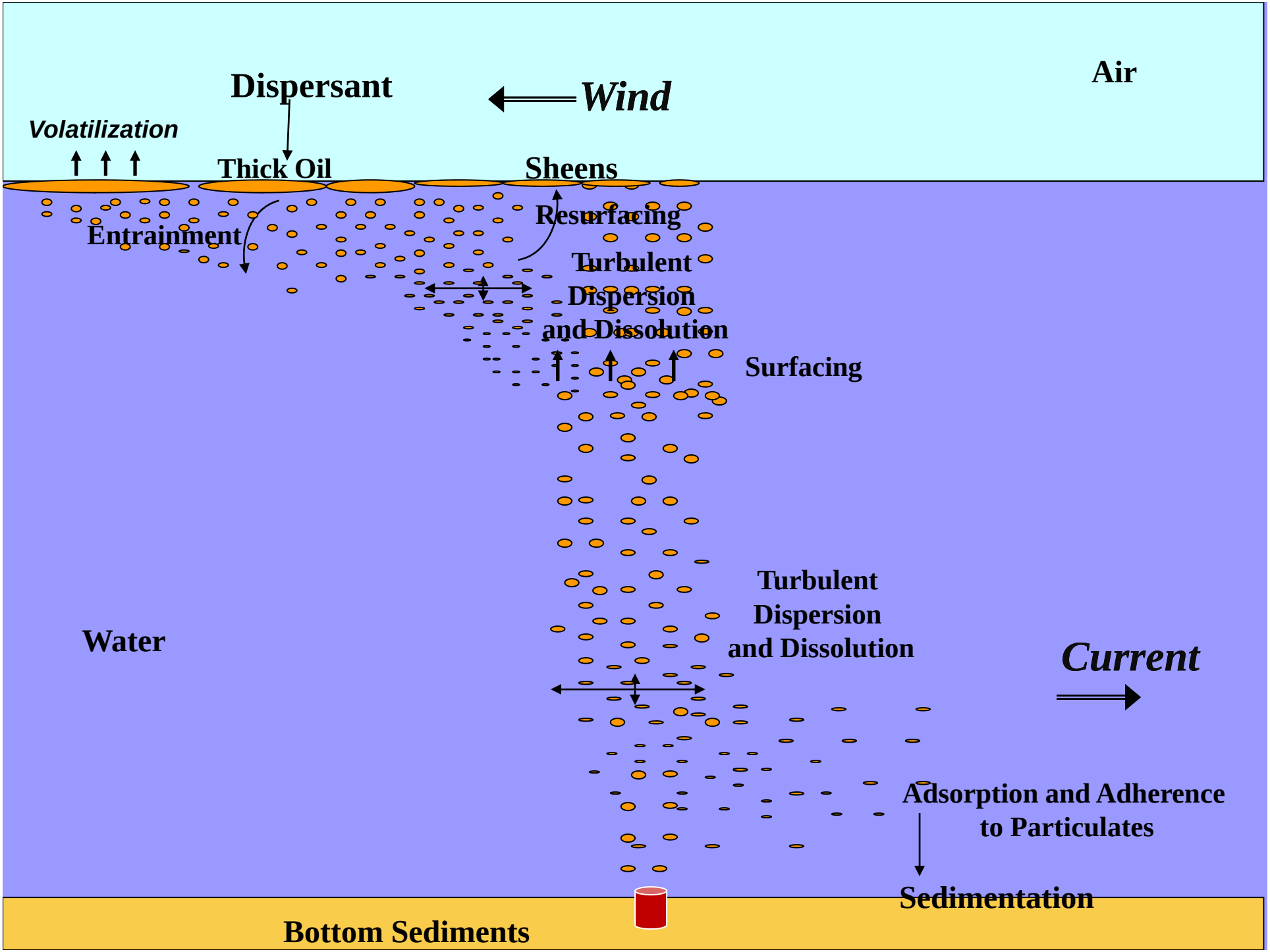
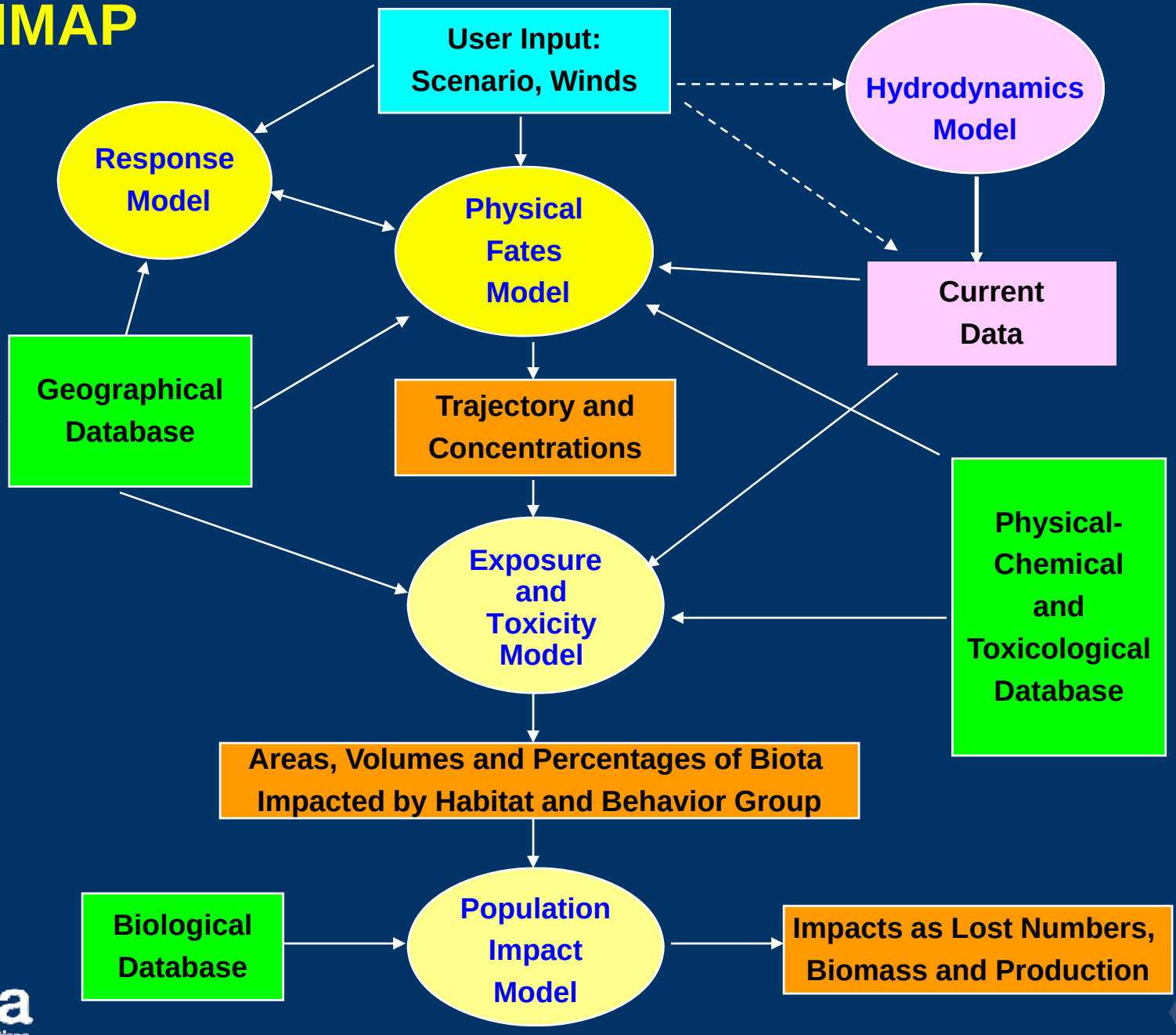

Air
Dispersant
Wind
Volatilization
Thick Oil
Sheens
Resurfacing
Entrainment
Turbulent
Dispersion
and Dissolution
Surfacing
Water
Turbulent
Dispersion
and Dissolution
Current
Adsorption and Adherence
to Particulates
Sedimentation
Bottom Sediments

SIMAP



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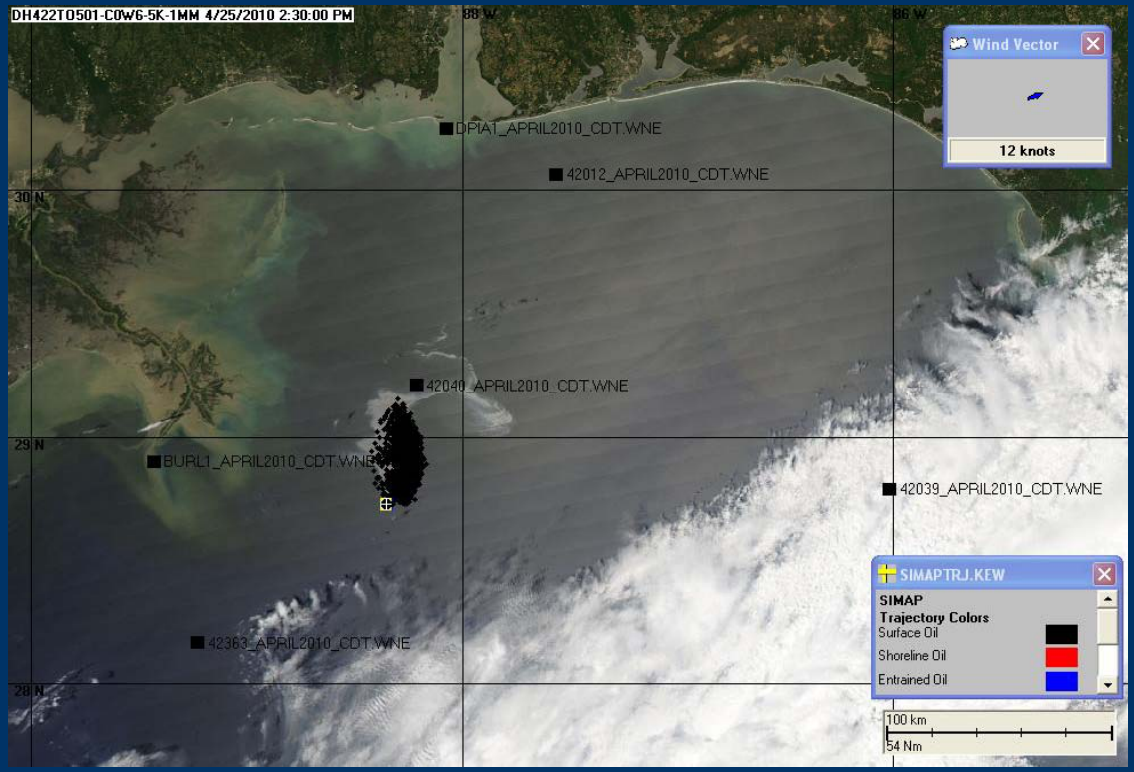
Model Calibration for Oil Fates

- Calibrate to
  - Observed oil movements
  - Shore oiling
  - Concentrations
    - Droplets in water column
    - Dissolved hydrocarbons
- Sensitivity analyses
  - Oil droplet size distribution
  - Currents
  - Diffusion coefficients



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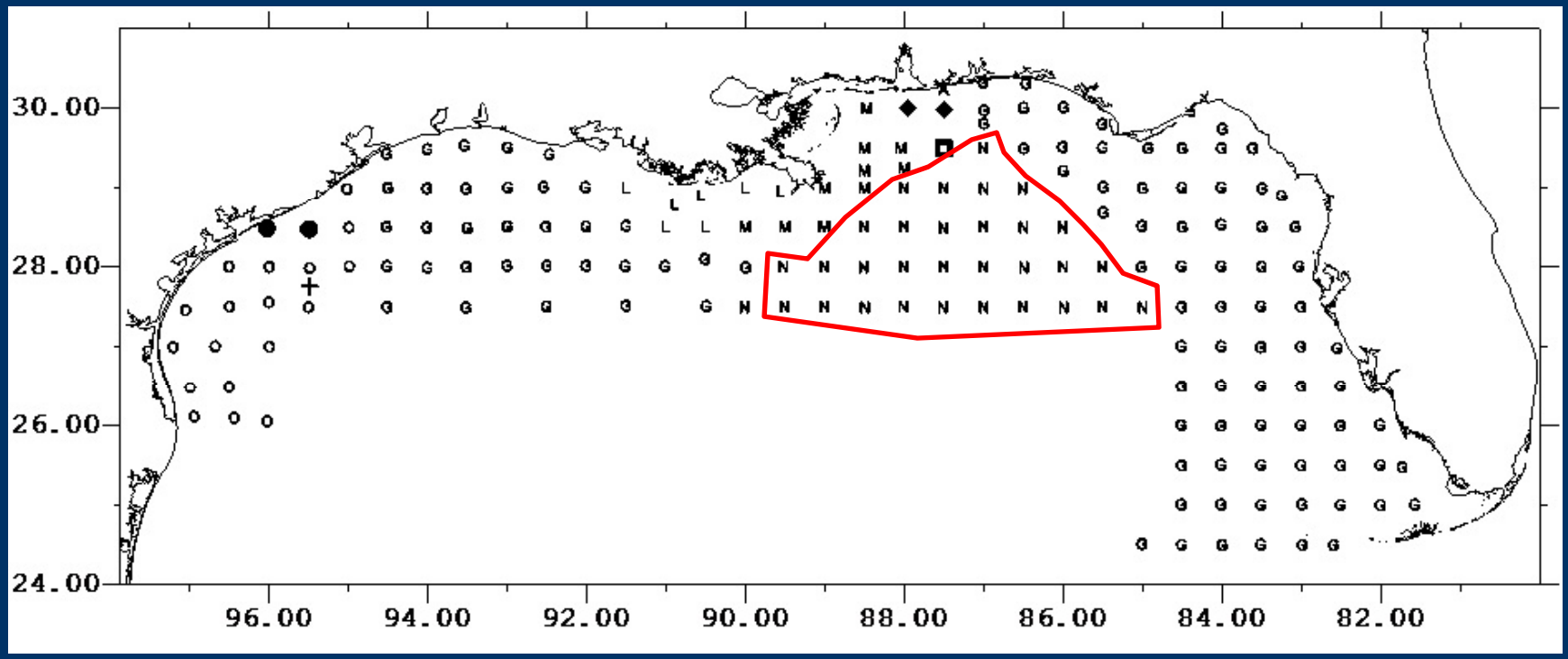
Offshore and Shelf TWG : Fish and Plankton Activities

- Modeling and Data Analysis
  - Conceptual
  - Biological: Densities, life histories, behaviors
    - Existing information
    - New data collections
  - Effects evaluations
- Cruises
  - Cooperative cruises each season
    - Plankton imaging systems
    - Bongo-neuston = Upper water column plankton
    - 1-m MOCNESS = deepwater plankton
    - 10-m MOCNESS = deepwater invertebrates & small fish
    - Midwater trawls = deepwater fish & large invertebrates
- Data analysis – just beginning

2010 Biological Sampling

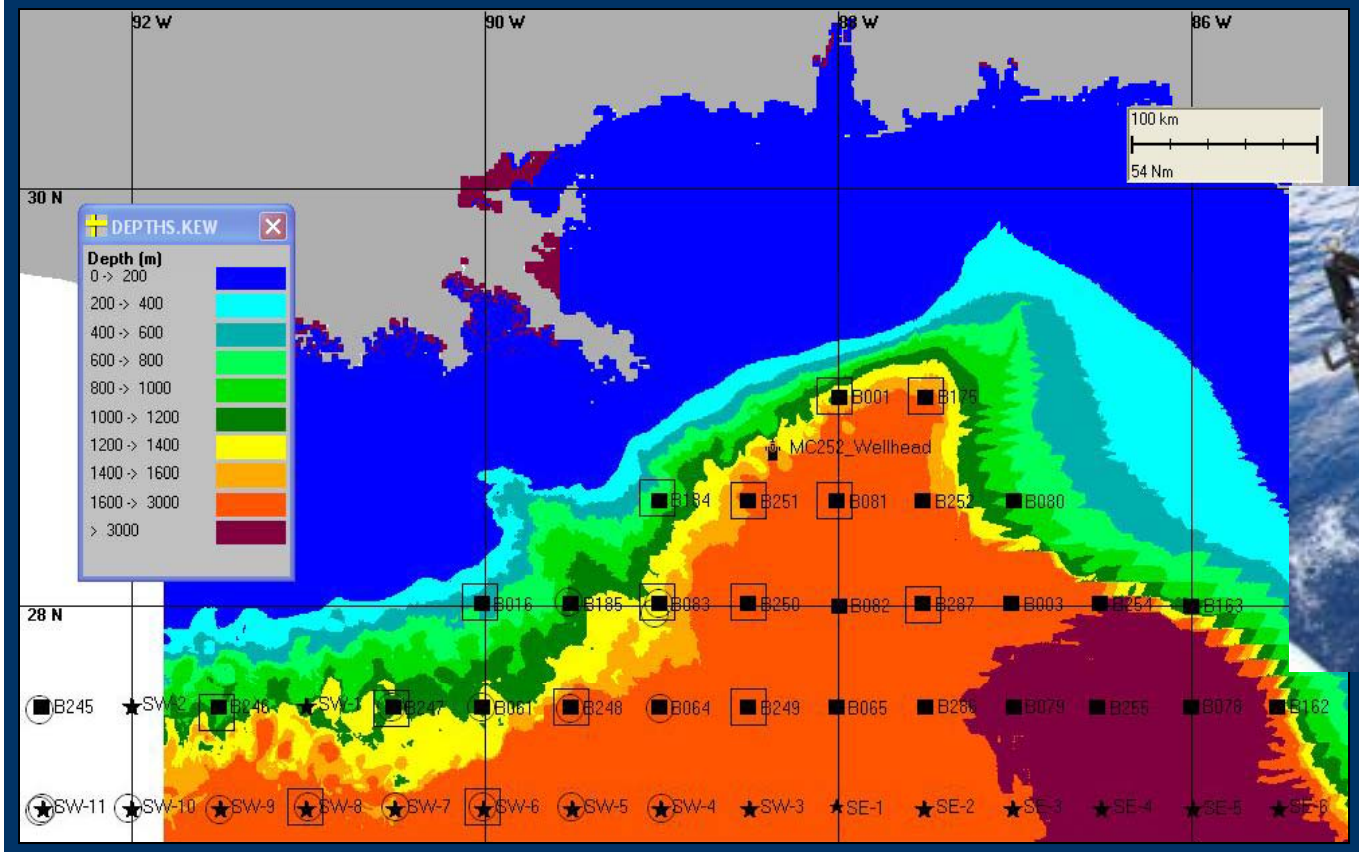
- **Bongo & Neuston Net Sampling**
  - **– *Gordon Gunter* – Aug 24-Sept 30; stations added (N)**



G: SEAMAP Plankton Stations; O : *Oregon* II, M : Mississippi stations; A : Alabama stations

2011 Biological Sampling

- **1-meter MOCNESS Sampling**
  - ***Nick Skansi*** **– Jan7-Apr 1, deep MOCNESS tows @ 46 stations, acoustics with SIMRAD EK60, CTD, FlowCAM**



Plankton Imaging Device Deployment

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Summary of 2011 Activities

- Cruises
  - Fish and Plankton
  - Physical oceanography
  - Seeps
- Data analysis
  - Physical
  - Chemical
  - Biological
  - Mapping/GIS
- Modeling
  - SIMAP
  - Hydrodynamics
- All require work plans and SOWs

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