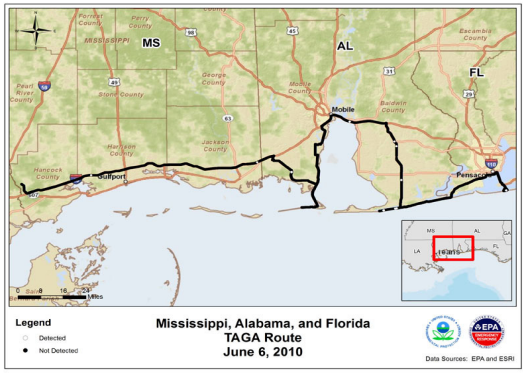
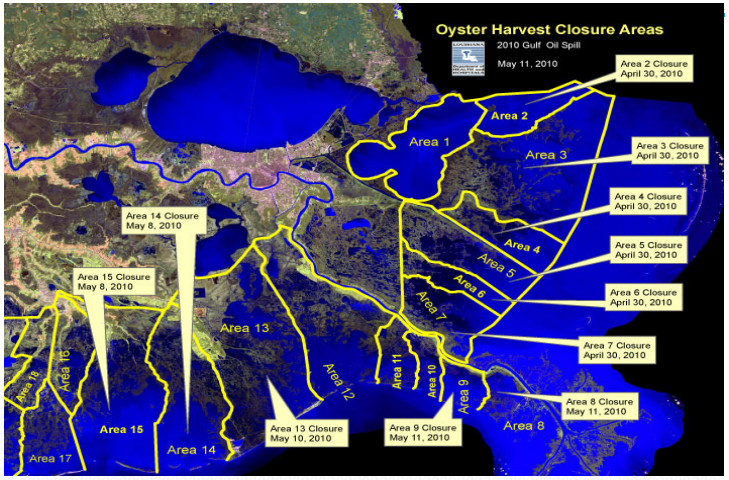




Monitoring Human Health Effects in Environmental Disasters

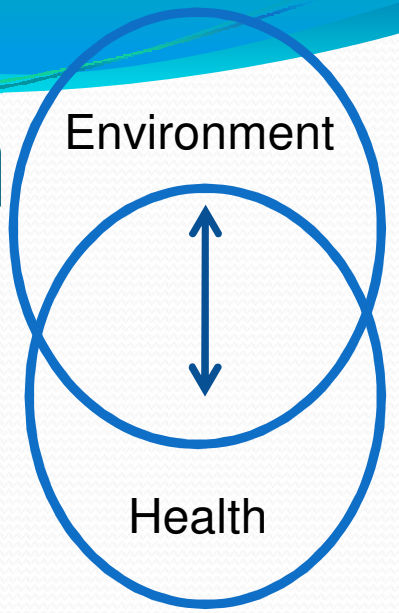
Dr. Jimmy Guidry
Louisiana State Health Officer
Department of Health and Hospitals

Goals and Objectives

- Describe environmental monitoring that informs public health actions to protect public health during environmental disasters:
    a. Air contaminants
    b. Seafood
    c. Beach advisories
    d. Worker safety

- Describe surveillance to track health outcomes related to environmental emergencies
    a. Surveillance of symptoms at ER, clinics and hospitals

Protecting Public Health



Response utilizes existing Infrastructure and programs

- Emergency Response
- Chemical Emergency Response Team
- Syndromic Surveillance for Bioterrorism/pandemics
- Fish Monitoring Program
- Laboratory

Health is different from Ecology

- Systematic Evaluation of Situation

→ Identify imminent and longer term hazards

- Air, water and seafood monitoring

→ What are the health impacts (populations)

- Syndromic Surveillance System

Assessing the Public Health Impact

Levels of Impact
Individuals
- Workers
- General public

Families
Coastal Communities
States

Resiliency

Physical Health Effects
- •Exposure to oil (components)
- •Heat Stress

Mental Health impacts
- •Stress
- •Economic uncertainty
- •Disruption of life
- •Impact on Culture and way of life

Public Health Surveillance

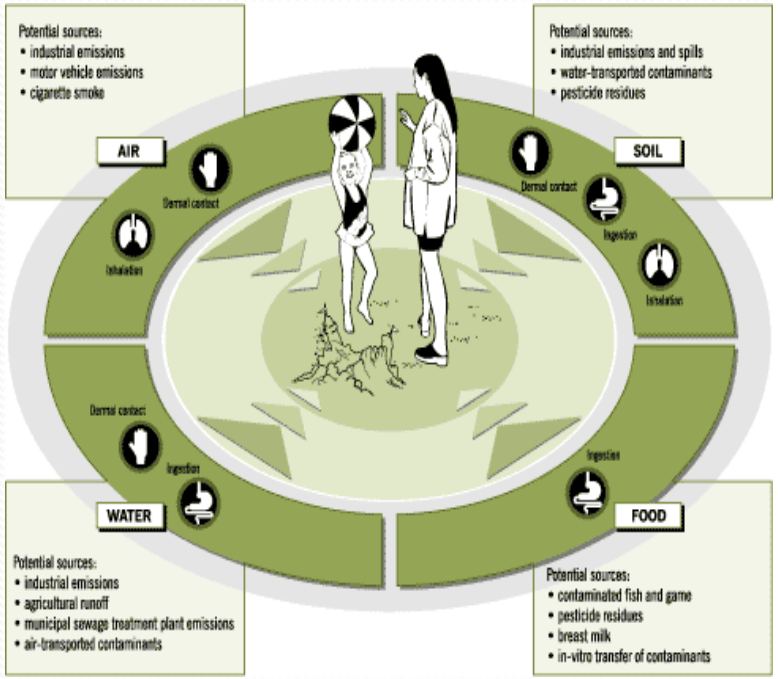
1. Environmental monitoring to detect contaminants
   - Identify contaminants of concern
   - Characterize potential exposures
   - Inform actions to protect public health

2. Health outcome surveillance
   - Identify increase in ER, clinic or hospitalizations for symptoms related to plausible health effects
   - Inform public health decisions to minimize health effects

Exposure

People must come into contact with contaminants in oil to have a health effect

- Inhalation: Breathing air with VOCs
- Ingestion: Eating seafood that has PAHs
- Dermal: Direct contact with the skin



Identify Contaminants of Concern

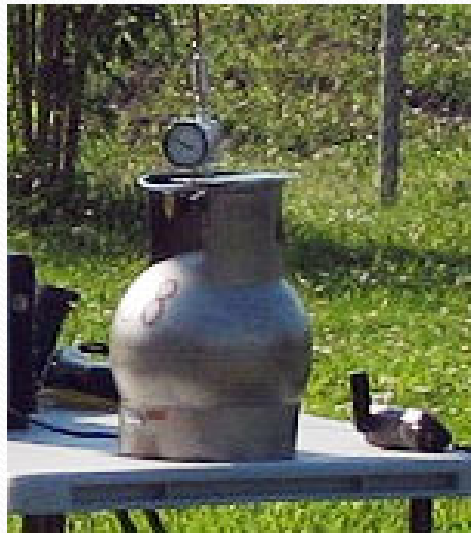
- Prioritize contaminants of concern (COC) in crude oil
  1. Volatile organic compounds – especially BTEX
     - Volatize into the air
     - Exposure risk to workers and others near the spill site
     - Health effects: headache, dizziness, nausea
     - Benzene – carcinogen

  1. PAH (polycyclic aromatic hydrocarbons)
     - Could be present in Mousse
     - Risk to seafood
     - Some PAHs are carcinogens

Monitoring for Exposure

- Environmental monitoring
  - Identify routes of exposure and environmental media
  - Determine which COCs are a risk to populations

1. Air monitoring
2. Public water systems for drinking water
3. Seafood testing
4. Advisories for beaches and recreational areas



Real-time Air Monitoring

EPA air monitoring data analyzed daily to Identify VOCs in the air along the coast

Results:

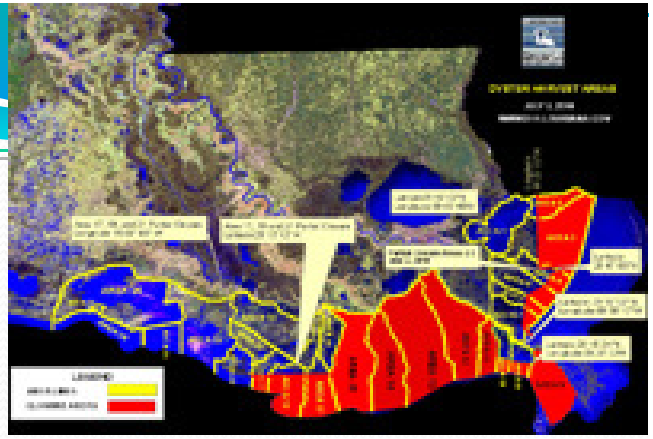
→ The VOC levels detected in air were well below those likely to cause health effects.

→ VOCs detected by air monitoring were related to fuel use and service stations.

Drinking Water Safety

- Drinking water is obtained from fresh water sources and is not likely to be impacted by the oil spill
- The Gulf of Mexico and coastal waters are not a source of drinking water
- Proximity of oil to water intakes was monitored daily and intakes would have been shut down if oil approached

Keeping Seafood Safe: Monitoring



Goal: Prevent the consumption of contaminated seafood

→ Tiered screening approach

- No visible oil must be present
- Sensory analysis by trained personnel
- Chemical testing for PAHs, particularly in oysters

Once a fishing area is closed, seafood must be shown to be clean prior to reopening.

- There were shortages of seafood at times, but the quality was high.

Seafood Sampling Results

	Total #	# with no detected level	# with any detected level	Above level of concern	Range (mg/kg)
Oysters	319	166	153	0	ND-0.042
Shrimp	141	107	34	0	ND-0.062
Crab	70	55	15	0	ND-0.014
Finfish	175	144	31	0	ND-0.014
All Seafood	705	472	233	0	ND-0.062

→ Bottom line: Concentrations detected in seafood sampling is far below levels of concern

PAH detected: Anthracene, Benzo(a)anthracene, Benzo(b)fluoranthene,Benzo(a)pyrene, Chrysene, Fluorene, Fluoranthene, Indeno(1,2,3-cd)pyrene, Naphthalene, Phenanthrene, and Pyrene. Sample dates: 4/30/2010 to 10/22/1020

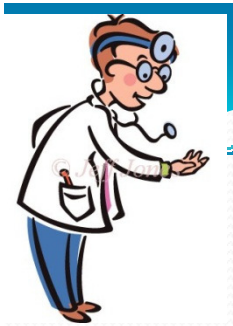
Beach Safety and Recreation

- People warned to avoid direct contact with tarballs or mousse
  - Especially pregnant women and children
- Public Health actions included:
  - Beaches Closures
  - Warning to stay off beaches
  - Swimming advisories
- Primary health concern is dermal irritation

Workers

Workers most likely to be exposed to oil components

- Exposure depends on jobs/hazard, location, type of oil and duration.
  - *Inhalation:* VOCs and particulates from the burning and booming of oil
  - *Dermal:* skin contact with oil or mousse
- Heat Stress is a major risk in the hot weather
  - Symptoms of heat stress similar to those of VOCs:
    - Headache, nausea, dizziness



Public Health Surveillance

- Population-based monitoring to identify reported health outcomes
  - Tracking probable health outcomes that could be linked to the effects of components in the oil
    - Asthma and Respiratory complaints
    - Self reported symptoms
- Surveillance tracks those seeking treatment or self reported symptoms

Health Surveillance in Louisiana

- Monitors reports of human health effects to oil contaminants and heat stress
  - Syndromic reporting: defined symptoms used as indicators
  - Reports from 7 hospitals in LA Regions 1,3 and 9; EDs, poison control center, acute care facilities.
  - Does not include injuries or acute conditions unrelated to oil exposure

- Limitations:
  - Self reported and cause of symptoms not confirmed
  - Captures only those who seek medical care
  - Not complete reporting

Health Surveillance in Louisiana

Louisiana: total of 423 reported complaints (10/30/10)

- Workers: 336
- Gen population: 87
  - Complaints from the general population primarily related to odors with mild symptoms reported.

Types:

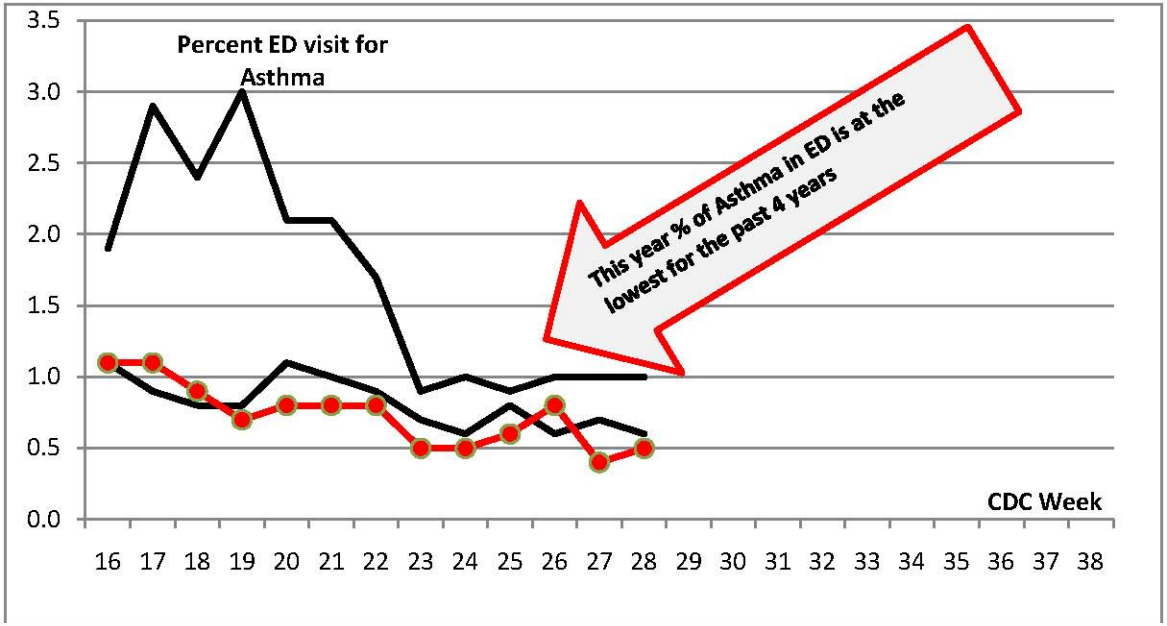
- Heat related complaints: 171
- Hospitalizations (all workers) 18

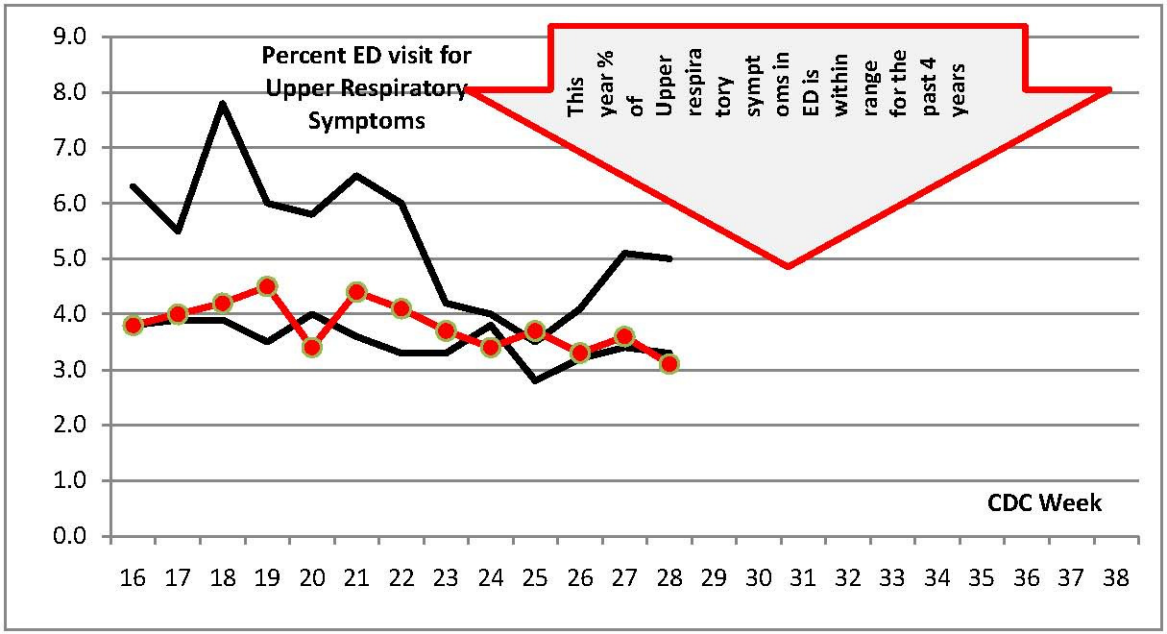
- Most frequently reported symptoms:
  - Headache, dizziness, nausea, vomiting, weakness/fatigue and upper respiratory irritation.

→Mental Health cases unknown

Comparison of 2010 weekly asthma and respiratory illness ED reports to last 3 years

→ Percent of reported symptoms within ranges of those of last 4 years.





LDHH's Summary Surveillance Reports

- Weekly oil spill related summary reports can be found at the following website:

http://new.dhh.louisiana.gov/index.cfm/page/79/n/104

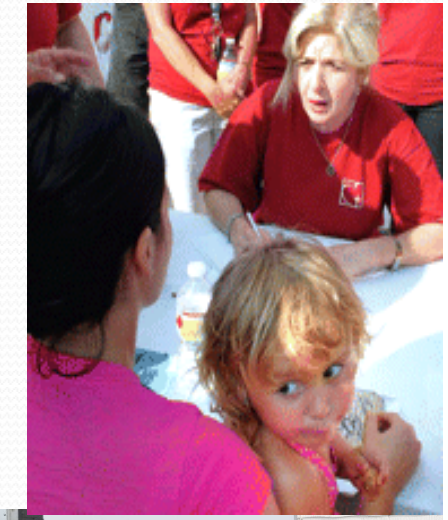
More than Physical Health

- Stress, fear, anxiety and uncertainty

- Large volume of oil released into Gulf
- Economic impact on coastal populations
- Disruption of livelihood
- 24 hour news coverage for months
- Conflicting views and opinions

- Not always recognized

- Tulane, LSU, Daughters of Charity have sent clinical services in coastal communities



Long Term Issues

Unprecedented situation

Institute of Medicine Identified several areas where more research is needed.

- What are the long term effects on workers?
- What mental health issues will emerge and how can we best address them now?
- How long will it take the oil to biodegrade or remediate?
- What will the health surveillance show us in the long term?

Long term follow-up

Gulf Oil study

- NIEHS is conducting a long-term study of oil spill clean-up workers
- Recruiting 55,000 workers to participate in clinical testing and questionnaires regarding health effects.
- Study designed to answer questions about long term health effects to spill clean-up workers and their communities.

QUESTIONS ???