Making the Connection – 2011

Human Health and Ecological Effects of the BP Deepwater Horizon Crude Oil Disaster

February 18, 2011

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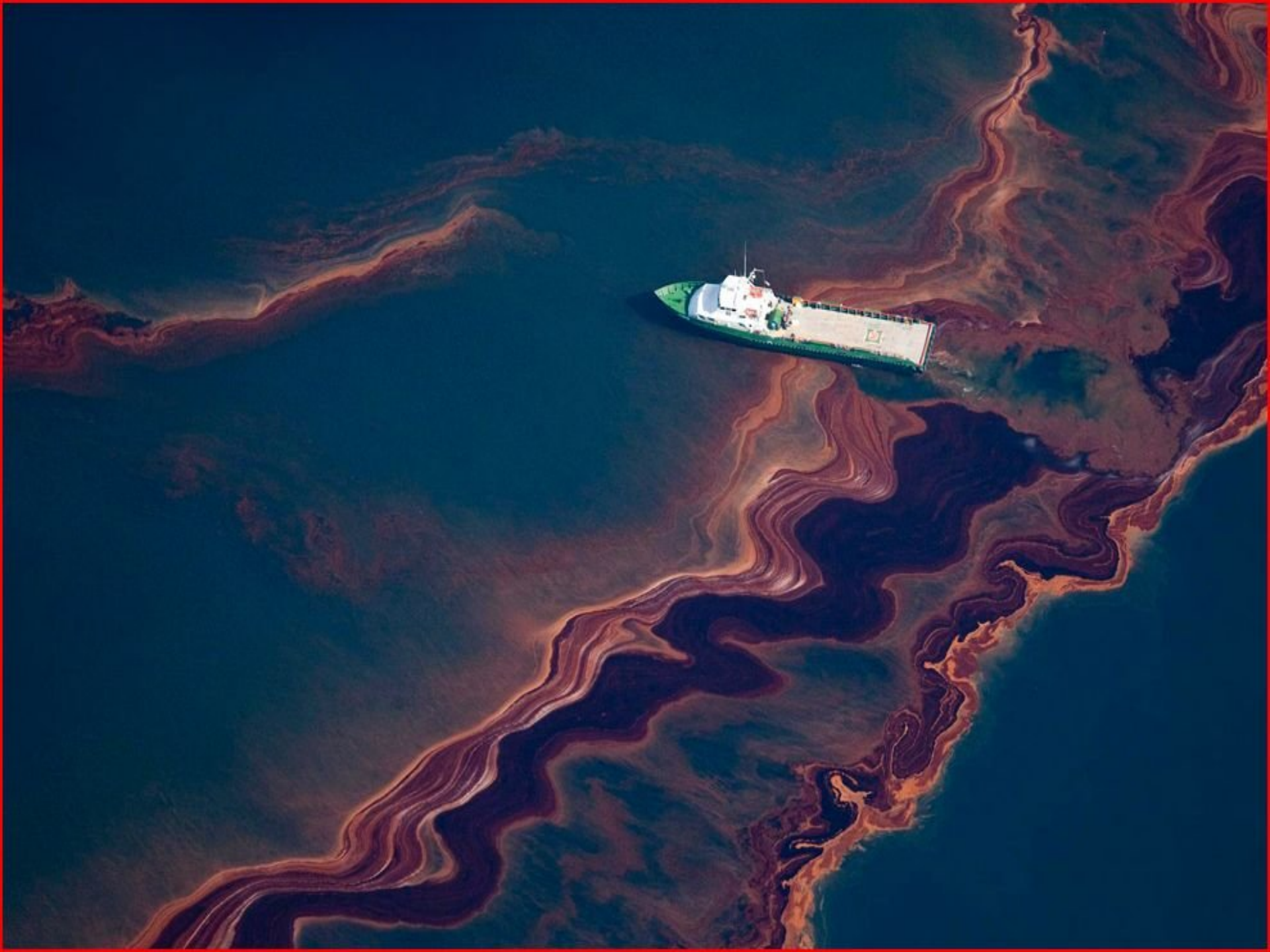
- Deepwater Horizon Rig Exploded and Burned 50 miles off the coast of Louisiana on April 20, 2010
- 11 workers were killed
- Deepwater Horizon Rig Sank into the Gulf of Mexico on Earthday, April 22, 2010
- Louisiana Sweet Crude and Natural Gas Poured from the well head 5,000 feet below the surface of the Gulf of Mexico from April 20 through July 15, 2010



- Crude oil hit the wetlands of coastal Louisiana 9 days after the explosion.

- Crude oil migrated into the wetlands, marshes, estuaries and beaches of Louisiana, Mississippi, Alabama and the panhandle of Florida

- Two human populations experiencing the most exposure due to the BP Disaster
  - Community members along the coastal areas of Louisiana, Mississippi, Alabama and the panhandle of Florida
  - Fishermen and workers employed to install booms and clean up the crude oil spill
  - Both of these communities consist of Environmental Justice communities: African American, Vietnamese, Pacific Islanders, Laotian, Native Americans

- Cleanup workers were exposed to the crude oil and dispersants on a daily and ongoing basis over a period of 4 to 5 months.
- A lesser number of workers are still being exposed.
- The pathways of exposure were inhalation, ingestion and skin contact.

- The workers were not provided with
  - adequate and appropriate training
  - adequate protective equipment

Dispersants Corexit 9500 & 9527

- 1.84 million gallons of Corexit 9500 and 9527 were applied to the BP crude oil spill
- 1.07 million gallons applied to the surface of the Gulf of Mexico
- 771,000 gallons applied subsurface near the well head

- For every 93 gallons of crude oil released into the environment by the BP spill, one gallon of dispersant was applied.
- In addition to the BP crude oil spill, a very large dispersant release occurred in the Gulf of Mexico.

Human Health Impacts Associated with the Dispersants Corexit 9500 & 9527

- Headaches
- Nausea
- Vomiting
- Diarrhea
- Abdominal Pains
- Dizziness
- Chest Pains & Tightness
- Eye, Nose, Throat & Lung Irritation
- Decreased Lung Function
- Difficulty Breathing
- Respiratory System Damage
- Rapid Breathing
- Asthma Attacks
- Allergic Reactions
- Skin Irritation, Damage, and Sensitization
- Hypertension
- Damage to Liver and Kidneys
- Central Nervous System Depression
- Neurotoxic Effects
- Damage to Red Blood Cells
- Genetic Damage and Mutations*
- Reproductive and Developmental Damage*
- Immune System Damage
- Cardiac Arrhythmia
- Cardiovascular Damage
- Increased Severity of Chronic Obstructive Pulmonary Disease
- *Health Impacts not yet recorded

- Dispersant was last applied off shore to the BP oil on July 19, 2010. Dispersant application was not allowed within 3 miles of the shore.

- There continue to be complaints of dispersant being applied to near shore and bay areas across the northern Gulf Coast.

Louisiana Sweet Crude Health Impacts

- **Pathways of Exposure**
  - **Inhalation**
  - **Ingestion**
  - **Dermal (Skin) Absorption**
  - **Eye and Skin Contact**

  - **Absorbs through skin, lungs and digestive system**

Health Impacts

- Headaches
- Nausea
- Vomiting
- Diarrhea
- Dizziness
- Confusion
- Loss of Balance
- Eye, Nose, Throat & Lung Irritation
- Difficulty Breathing
- Respiratory Impacts
- Chemical Pneumonia
- Skin Irritation & Damage
- Damage to Liver, Lungs, Kidneys and Respiratory System
- Decreased Lung Function
- Central Nervous System Effects
- Neurological Damage/Nervous System Damage
- Blood Disorders
- Blood Cancer-Leukemia
- Aplastic Anemia
- Mutations & Birth Defects*
- Infertility*
- Immune System Damage & Suppression
- Cardiovascular System Stress
- Gastrointestinal Disturbance
- Endocrine Disruption
- Hormone Level Disruption

- *Health Impacts not yet recorded

Crude Oil Aerosols

- Crude oil aerosols were formed by the crude oil slick being impacted by rough seas and high wind conditions.
- The crude oil aerosols moved on shore before the oil slicks hit the coast line and continued to move onshore after the crude oil flow was stopped.
- The crude oil aerosols caused odor events and resulted in health impacts to community members along the coastal areas of Louisiana, Mississippi, Alabama and the panhandle of Florida
  - Headaches
  - Nausea
  - Respiratory impacts
  - Irritation to eyes, nose, throat and lungs
  - Asthma attacks

- Fishermen and cleanup workers experienced the same health impacts but more severe
- In addition the cleanup workers experienced
  - Skin irritation and sores
  - Difficulty breathing
  - Chest pains
  - Diminished lung function
  - Depression
  - Suicidal Tendencies

- Cleanup workers are continuing to get sicker and their health impacts covered the long list associated with the crude and dispersant.

Working with Louisiana Environmental Action Network (LEAN)

- LEAN provided protective gear and respirators to the fishermen workers – beginning May 4
- LEAN and fishermen challenged BP in US District Court on May 7,2010 – BP signed a Consent Decree to take responsibility to ensure workers were properly trained and provided protective equipment
- Workers feared losing their jobs and would not speak out about their health impacts
- Wives of workers spoke out until they were told to be quiet or their husbands would loose their jobs

OSHA

- Interacted with OSHA on their lack of enforcement of worker protection and safety regulations
- May 16 OSHA issued directive on required training and protective gear
- BP continued to fail to provide respirators and protective gear
- Workers continued to be required to work while coming in direct contact and inhaling the crude oil and dispersant

OSHA

- May 25 OSHA stated they had serious concerns for workers safety and health in the Deepwater Horizon Oil Spill Response.
- The systems BP currently has in place for worker safety, health training, protective equipment are not adequate for the current situation or the projected increase in cleanup operations.
- Workers continued to be exposed and suffer health impacts through out the cleanup efforts

- This is 2010. The BP Spill containment and cleanup is a work place environment.

- It is unacceptable for workers to be made sick in a work place environment in 2010.

NIEHS

- August 17, 2010, National Institute of Environmental Health Sciences (NIEHS) – presented preliminary plans for a Gulf Worker Study to track the health impacts of oil spill workers and volunteers.
- NIEHS received 10 million from the federal government and 10 million from BP for the study
- The Health Study will examine Short-Term and Long-Term Health Impacts of oil spill workers and volunteers.
- 75,000 individuals will be studied

NIEHS

- The NIEHS study does not address the large population of community members in the coastal areas exposed to and suffering from health impacts associated with the crude oil aerosols.

- The NIEHS study will not provide medical services to those who are ill.

- Crude Oil flowed into the Gulf of Mexico for 87 days.
- 207 million gallons of Crude flowed from the wellhead
- 172 million gallons of crude were released into the environment.
- 35 million gallons of crude were captured
- Crude Oil Remaining in the Environment
- 53 million gallons of crude oil was estimated to be remaining in the environment in mid-September 2010.
- This is more than 4 times the total volume of the Exxon Valdez.

- Recent Monitoring and Sampling performed in the bird foot area of the Mississippi River, Barataria Bay, Timbalier and Terrebonne bays and the Atchafalaya delta demonstrate the presence of substantial crude oil in the marsh and wetland areas as well as the aquatic organisms.

- Oiled and dead birds, mammals and aquatic organism are spread throughout the wetlands and beach areas.

Wetlands and Ecosystem Soil/Sediment

- Alkylated Polynuclear Aromatic Hydrocarbons – 6 to 89 PAHs
- Oil Range Organic Petroleum Hydrocarbons (ORO) up to 11,600 mg/kg (1.16%)
- Corresponded to the fingerprint of the BP Louisiana Sweet Crude
- Sixty percent (60%) of the soil/sediment samples had up to 18 PAHs in excess of the Marine Sediment Screening Levels
- Arsenic in excess of Marine Sediment Screening Levels
- All of the areas sampled had soil/sediments contaminated with Alkylated PAHs and Oil Range Organic Petroleum Hydrocarbons

Tissue

- **Oyster**
  - Up to 8,815 to 12,500 mg/kg Oil Range Organic Petroleum Hydrocarbons
  - Alkylated PAHs – Fluoranthene, Naphthalene, Phenanthrene, and Pyrene
- **Blue Crab**
  - Up to 2,230 to 3,583 mg/kg Oil Range Organic Petroleum Hydrocarbons
  - Alkylated PAHs – Fluoranthene, Naphthalene, Phenanthrene and Pyrene
- **Shrimp**
  - Up to 8,356 mg/kg Oil Range Organic Petroleum Hydrocarbons
  - Alkylated PAHs- Anthracene, Fluoranthene, Naphthalene, Phenanthrene and Pyrene

Tissue

- **Mussel**
  - 6,900 mg/kg Oil Range Organic Petroleum Hydrocarbons
  - Alkylated PAHs – Anthracene, 2-Methylnaphthalene, Naphthalene, and Phenanthrene
- **Finfish**
  - Up to 21,575 mg/kg (2.1575 %) Oil Range Organic Petroleum Hydrocarbons

Dr. Jane Lubchenco, Administrator of NOAA Sep. 15, 2010 Press Conference

- "Seafood is free of contamination"
- My research of data from the federal and state agencies: the sea food is contaminated with PAHs.
- 43% of the oysters sampled contain PAHs.
- 24% of all the seafood sampled through 8-26 contained PAHs
- The levels however, were below the levels of concern established by FDA.
- Dr. Lubchenco should have stated that the seafood contained contaminants below the levels of concern developed by the FDA for the Deepwater Horizon Oil Spill.
- After contacting her, she did change her statement, 10 days later.

FDA

- The FDA begins testing of seafood with the sensory or smell test.
- The FDA established levels of concern for PAHs in shrimp, crabs, oysters and fin fish. The Levels of Concern are elevated above normal FDA levels for seafood.
- PAHs
  - Naphthalene
  - Fluorene
  - Anthracene/Phenanthrene
  - Pyrene
  - Fluoranthene
  - Chrysene
  - Benzo(k)fluoranthene
  - Benzo(b)fluoranthene
  - Benzo(a)anthracene
  - Indeno(1,2,3-cd)pyrene
  - Dibenzo(a,h)anthracene
  - Benzo(a)Pyrene

FDA

- The FDA stated, they “have developed specific PAH seafood levels of concern for the unprecedented Deepwater Horizon Oil Spill event, and will not necessarily be applicable after all fisheries are reopened for safe harvest.”
- The FDA levels were based on consumption rates well below the general consumption rates of coastal communities and failed to consider vulnerable populations.
- Thus the levels of concern are too high to be protective of human health.
- The FDA also failed to establish a level of concern for Oil Range Organic Petroleum Hydrocarbons

Blood Testing for Volatile Solvents

- Blood Samples have been collected from individuals who are ill:
  - Cleanup Workers
  - Fishermen and Crabbers
  - Divers
  - Coastal Residents

- The blood samples contained:
  - Benzene
  - Ethylbenzene
  - m,p-Xylene
  - Hexane
  - 2-Methylpentane
  - 3-Methylpentane
  - Isooctane

Chemicals in excess of NHANES 95th Percentile

- Benzene 36 times
- Ethylbenzene 5.7 times
- m,p-Xylene 5.68 times
- Hexane

Individuals with highest levels of chemicals in their blood

- Male Diver 47 years old
  - Ethylbenzene 5.6 times NHANES 95th Percentile
  - m,p-Xylene 5.68 times NHANES 95th Percentile
  - Hexane
  - 2-Methylpentane
  - 3-Methylpentane
  - Isooctane

- 10 year old Male - family crabbers
  - 2-Methylpentane - highest concentration
  - 3-Methylpentane - highest concentration
  - Isooctane
  - Benzene
  - Ethylbenzene
  - m,p-Xylene
  - Hexane

Oil in the Ecosystem

- Along the shores
- On beaches
- In the estuaries and wetlands
- Near shore areas
- Subsurface water column from 3,000 to 4,300 feet depth in the Gulf of Mexico
- Sediment surface on the Gulf of Mexico sea floor
- Light sheens of oil remain in the Gulf and bay areas
- Oil continues to wash on shore as tar balls and mats
- The environmental and human health impacts of the BP spill will last for generations.