

Increased Gulf Aerosol Formation due to Oil

Research aircraft performing measurements to characterize aerosol plume

Abundant VOC's increase aerosol formation

Aerosols usually formed as Organic Aerosol or Secondary Organic Aerosol

Sea spray constitutes most OA, but SOA was shown greatly spiked

aerosol particle sizes are usually consistent, not in plume

Aerosols studied without combustion product interference

Dynamics of plume monitored in time position and composition

Composition of oil spill reflected in aerosol.

Several water soluble species do not make it to atmosphere

Different volatilities have different formation dynamics for SOA's

Compounds in oil were classified by volatility ($\mu\text{g}/\text{m}^3$)

Carbon chain length approximates

Aerosols formed more efficiently from less volatile compounds

compounds present between 10-100 hours after spill

More volatile compounds don't recondense as easily

Less volatile compounds don't make it into the atm as easily (SVOC)

Intermediate is prime aerosol formation (IVOC)

The IVOC's were shown to contribute the most to SOA formation

approximately C9-C14 hydrocarbons

OA plume moving north west causing restricted visibility

More complicated interactions anticipated due to increased aerosol surfaces

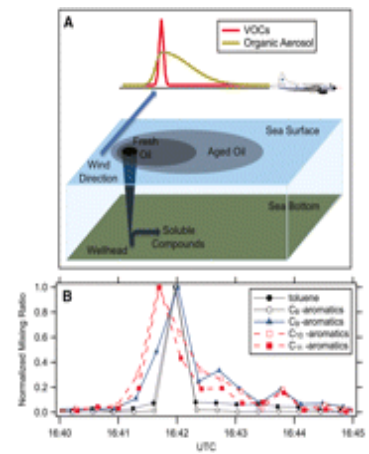
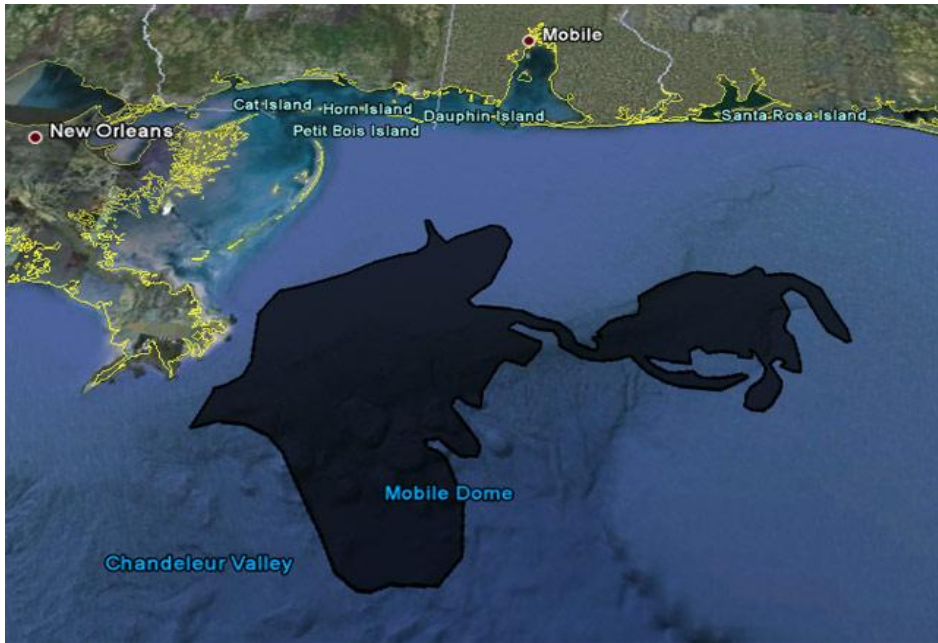
chemical interactions

Reactions with radicals, frequently triggered through photolysis

dispersal, rain out

References

1. de Gouw, J.A., Middlebrook, A.M., et al. Organic Aerosol Formation Downwind from the Deepwater Horizon Oil Spill. Science 331, 11 March 2011



Gulf Oil Spill Layers

- Oil Slick Overview [KML](#)
Credit: [U.S. Coast Guard](#)
- Observed Spill 5/5/2010 [KML](#)
Credit: [State of Louisiana](#)
- Observed Spill 5/3/2010 [KML](#)
Credit: [State of Louisiana](#)
- Observed Spill 5/2/2010 [KML](#)
Credit: [State of Louisiana](#)
- Booms [KML](#)
Credit: [State of Louisiana](#)
- Fishing Closure [KML](#)
Credit: [State of Louisiana](#)
- Oil Spill Points of Interest
Credit: [LABucketBrigade.org](#)
User-generated content.
[Contribute](#)
- ENVISAT Radar Imagery
Captured 5/2/2010.
Credit: ENVISAT ASAR data
product: Copyright [ESA](#) 2010
- MODIS Satellite Imagery
Captured 4/29/2010.
Credit: [NASA](#) 2010.
- MODIS Satellite Imagery
Captured 4/25/2010.
Credit: [NASA](#) 2010.
- MODIS Satellite Imagery
Captured 4/21/2010.
Credit: [NASA](#) 2010.

