

The Gulf of Mexico Research Initiative

*From Response to Coordinated Research
Established 2011*

www.gomri.org



Deepwater Horizon



Credit: AP Photo/Charlie Riedel

- GoMRI is not part of the National Academy of Science or RESTORE



Credit: SAUL LOEB/AFP/Getty Images

Mission

The mission of Gulf of Mexico Research Initiative (GoMRI) is to implement an independent research program that will

- (1) study the effect, and the potential associated impact, of hydrocarbon releases on the environment and public health**
- (2) Develop improvements for spill mitigation, oil detection and characterization, and advanced remediation technologies.**

Research Themes

1. **Physical distribution and ultimate fate of contaminants associated with the *Deepwater Horizon* incident;**
2. **Chemical evolution and biological degradation of the contaminants;**
3. **Environmental effects of the contaminants on Gulf of Mexico ecosystems, and the science of ecosystem recovery;**
4. **Technology developments for improved detection, characterization, mitigation, and remediation of offshore oil spills; and**
5. **Impacts of oil spills on public health.**

Research Board

- ▶ Rita Colwell – UMD & JHU
- ▶ Margaret Leinen – FAU
- ▶ Debra Benoit – Nicholls State
- ▶ Peter Brewer – MBARI
- ▶ Richard Dodge – NOVA SE
- ▶ John Farrington – WHOI
- ▶ Kenneth Halanych – Auburn
- ▶ David Halpern – NASA
- ▶ William Hogarth – FIO
- ▶ Jörg Imberger – W. Australia
- ▶ Raymond Orbach – Tx Austin
- ▶ Jürgen Rullkötter – University of Oldenburg, Germany
- ▶ David Shaw – MSU
- ▶ John Shepherd – University of Southampton, UK
- ▶ Bob Shipp – South Alabama
- ▶ Burton Singer – Florida
- ▶ Ciro Sumaya – Texas A&M
- ▶ Dennis Wiesenburg – USM
- ▶ Rick Shaw – LSU
- ▶ Dana Yoerger – WHOI
- ▶ Michael Carron – GOMA ¹
- ▶ Chuck Wilson - CSO ¹

¹ *Ex Officio*

All Funded Research to Date

- ▶ Year One Block Grants – \$45M, 149 Projects (some still in progress)
- ▶ Summer 2011 Bridge Grants (RFP III) – \$1.5M, 17 Projects (completed)
- ▶ Year 2 (2012) –8 Consortia Grants (RFP I) – \$110 M, 8 RC (in progress)
- ▶ Year 3–5 (2013) Investigator Grants (RFP II) – \$18.6 M, 19 projects (in progress)
- ▶ In the past two years (as of December 31, 2013)
 - @ 277 scientific peer-reviewed publications/book chapters
 - over 300 manuscripts in preparation or submitted for peer review
 - over 1300 presentations and poster sessions given at conferences and scientific meetings .
 - @350 graduate students.

▶ Publication Titles
Journal

Count

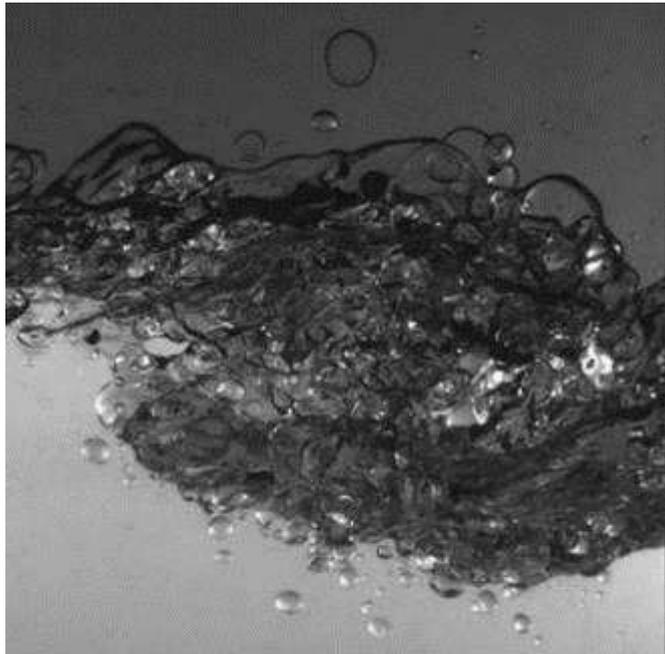
18	Environmental Science & Technology
12	PLoS ONE
10	Langmuir
10	Energy & Fuels
8	Environmental Research Letters
7	Journal of Geophysical Research
6	Proceedings of the National Academy of Sciences of the United States of America
6	Journal of Physical Oceanography
5	Marine Pollution Bulletin
6	Geophysical Research Letters
5	Ocean Modeling

GoMRI Grants (RFP I & II)

• Dispersion by physics and plankton, behavior and hydrocarbon transformation of deep oil spills, influences on fate and transport, environmental consequences, ecosystem impacts, oil plume fate, ecotoxicology, improved dispersants, modeling of fate, transport, and ecosystems

- 1 - ESP
- 1 - DEU
- 2 - NLD
- 1 - NOR



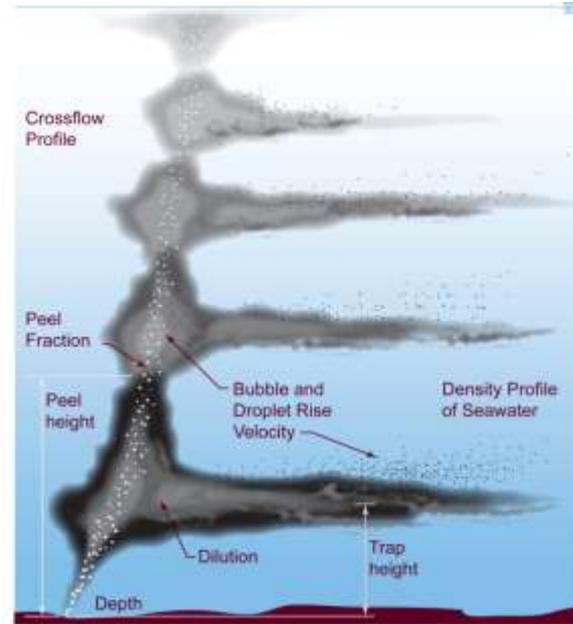


43.2

38.1

Initial Conditions:

- Gas and Oil Flowrate
- Bubble and Droplet Size
- Density of Gas and Oil

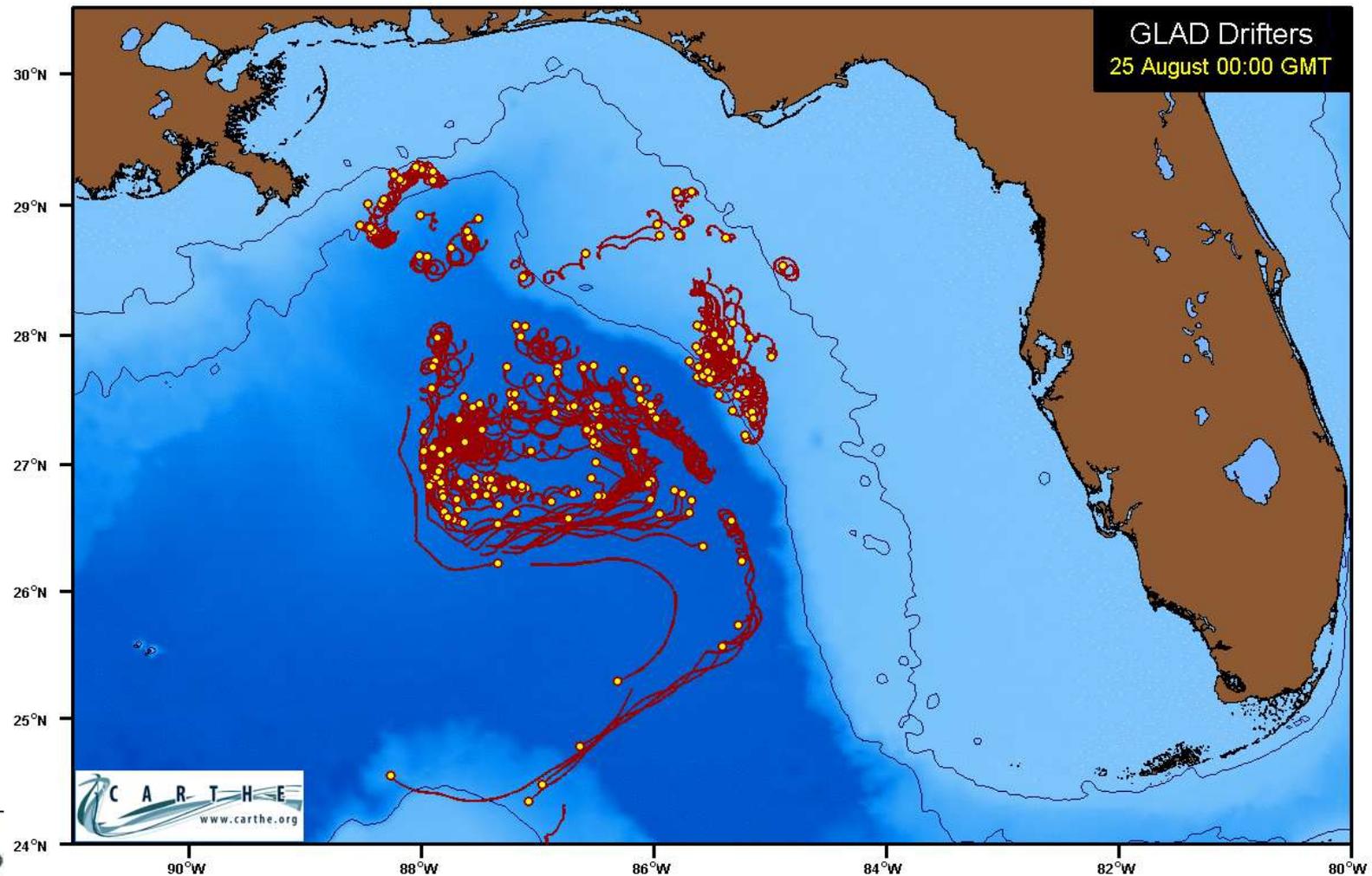


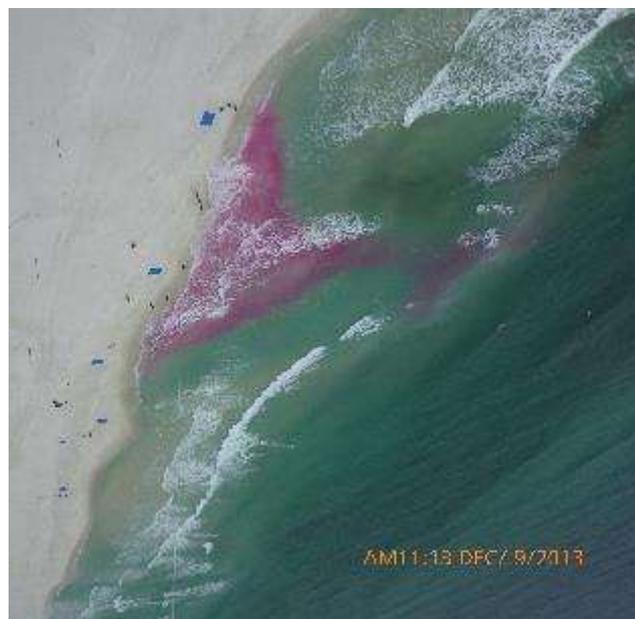
Complications from Chemistry

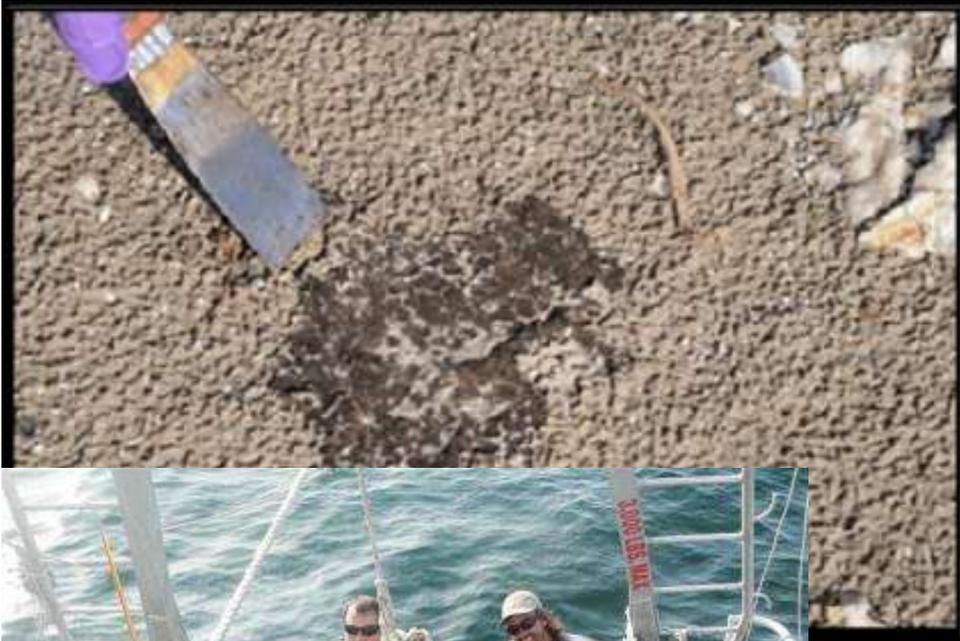
- Gas Hydrate Formation
- Gas and Oil are Mixtures
- Gas and Oil Dissolution
- Oil may be at Effervescing some Gases
- Formation of Emulsions

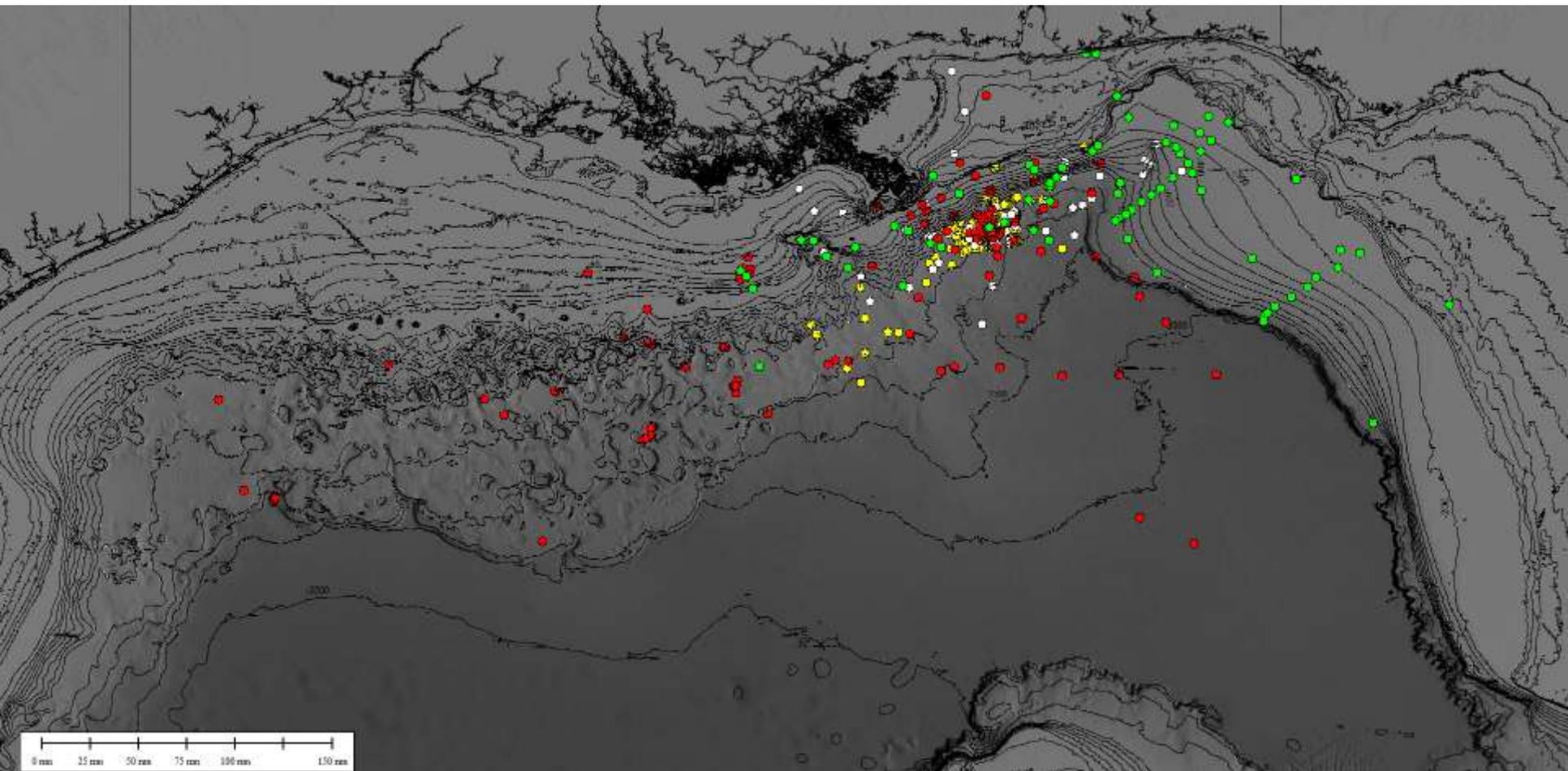


CARTHE – Univ of Miami – Drifter study encounters Hurricane Isaac









Taxonomic Categories		# of Hits
OIL	Chemical Properties	12
	Bacteria	11
	Natural Seepage	2
DISPERSANTS	Oil Breakup	10
	Chemical Constituents and Compositions	7
	New Dispersants	6
	Toxicity	7
MODELING	Physical Processes	40
	Chemical Processes	13
	Ecosystem Function	18
ENVIRONMENTAL IMPACTS	Phytoplankton	5
	Zooplankton	9
	Benthic Microbial Community	13
	Crustaceans	2
	Fish	11
	Marine Mammals	2
	Insects / Spiders	1
	Mollusks	3
	Avian Communities	2
	Deep Sea Ecosystem	6
	Shallow Ecosystem	4
	Marsh Erosion	4
		Biomarkers related to oil exposure
BASELINE GOM		3
HUMAN HEALTH	Toxicological	1
	Mental Health	0
SOCIO-ECONOMIC		0
TECHNOLOGY		5

Recent highlighted papers at *[/gulfresearchinitiative.org/](http://gulfresearchinitiative.org/)*

- ▶ Wave Data Can Improve Forecasts that Help Search and Rescue Operations and Oil Spill Response.
- ▶ Mechanics of Dispersant Adsorption at Oil–Water Interface.
- ▶ Accuracy of 2010 Model Predictions for Oil Spill Movement.
- ▶ Describes How an Oil Slick Could Influence Its Own Movement.
- ▶ Determine Source of Dispersant Chemicals Found in Community–Led Water Study.
- ▶ Sugar Molecules Can Remove Crude Oil from Sand.
- ▶ PAHs in Mississippi Seafood below Levels of Concern.
- ▶ Study Describes Use of Oil Fingerprinting to Identify Source of 2012 Gulf Sheen.
- ▶ Study Indicates “Memory” of Benzene Remains in Marsh Sediment and Affects Its Future Degradation
- ▶ Study Confirms Methane–Eating Bacteria Contributed to Carbon Entering Food Web

GRIIDC – Gulf of Mexico Research Initiative Information & Data Cooperative

- ▶ (GRIIDC) is the vehicle by which is implementing the Research Database and will help to address the data and information needs of the GOMRI. The GRIIDC will serve the GoMRI by assisting researchers with data archiving and ensuring data interoperability among GoMRI and other datasets.
- ▶ The **mission** of the GRIIDC is to ensure a data and information legacy that promotes continual scientific discovery and public awareness of the Gulf of Mexico ecosystem

OUTREACH, EDUCATION AND COMMUNICATION

- ▶ WEBSTE
- ▶ PODCASTS
- ▶ MEDIA EVENTS
- ▶ FESTIVALS, AQUARIA AND OTHER PUBLIC VENUES
- ▶ NEWS STORIES



RFP-IV: Save the Date for 2015-2017 GoMRI Research Consortia

- ▶ **November 15, 2013 -2015-2017 GoMRI Research Consortia RFP release**
- ▶ **January 15, 2014 - Pre-proposal deadline**
- ▶ **January 16-March 15, 2014 - Pre-proposal review and feedback**
- ▶ **June 10, 2014 - Full proposal deadline**
- ▶ **November 14, 2014 - Award announcement**
- ▶ **January 1, 2015 - Award start date**

Gulf of Mexico Oil Spill & Ecosystem Science Conference: Title TBD



2015 meeting Feb 16 – 20 Houston Texas

Sponsors and Partners

GoMRI, NOAA, EPA, USGS, FDA, GOMURC, GOMA,
COL