


# **NCCOS-Charleston Research and the Hollings Marine Laboratory Partnership**

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NATIONAL CENTERS FOR COASTAL OCEAN SCIENCE

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An aerial photograph of Fort Johnson, South Carolina, showing various research facilities. The image is annotated with text labels for several key institutions. The background features a mix of green trees, grey parking lots, and white and tan buildings. A body of water is visible in the upper left corner.

**MUSC Marine Biomedicine**

**College of Charleston  
Grice Marine Laboratory**

**SC DNR Marine  
Resources  
Research Institute**

**NOAA  
Hollings Marine  
Laboratory**

**NOAA Center for Coastal  
Environmental Health and  
Biomolecular Research**

**Marine Research Resources at Fort Johnson**

# NCCOS Science Focus in Charleston

## **Harmful Algal Bloom Research and Analytical Response**

Leadership: [Dr. John Ramsdell](#)

Use advanced technology to study complex problems, developing novel approaches to reduce impacts of harmful algal blooms (HABs) on marine animal health, human health, and quality of the coastal environment.

## **Pollution and Land Use Impacts on Coastal Waters and Resources**

Leadership: [Dr. Mike Fulton](#)

Use combined measures of contaminant concentrations, their toxicity to organisms, and conditions of living resources to develop statistical and spatial models for resource managers. The science and tools allow managers to predict impacts from coastal development and pollution events and test strategies that can mitigate impacts on coastal ecosystem health and quality of life.

## **Coastal Ecology and Regional Ecosystem Assessments**

Leadership: [Dr. Jeff Hyland](#)

Survey benthic communities and habitat characteristics to determine how environmental conditions change with time, and assess the social, economic and biological effects of human activities on coastal ecosystems.

## **Oceans and Human Health**

Leadership: [Dr. Lori Schwacke](#)

Developing advanced analytical tools and modeling techniques to evaluate and predict marine ecosystem health. By focusing on sentinel species and sentinel habitats, we are establishing early warning signals of environmental threats that can be incorporated into management decisions.



# Hollings Marine Laboratory (HML)

- Unique Partnership
- Laboratory Operated by NOAA/NOS/NCCOS
- HML's Joint Partnering/Project Agreement
  - HML's Science Board
  - HML's Executive Board



**MUSC**  
MEDICAL UNIVERSITY  
OF SOUTH CAROLINA

**NIST**

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# HML Specialized Facilities



**Environmental Chemistry**  
(12,400 sq ft)



**Cryogenic Storage (3,800 sq ft)**  
including Marine Environmental  
Specimen Bank



**Molecular Biology &  
Physiology Labs (11,500 sq ft)**



**Aquatic Production (5,100 sq ft)**  
& Seawater System



**>100,000 sq ft**

**Culture & Challenge Laboratories**  
(1,270 sq ft) & **BSL 3 Laboratories (4**  
**@ 1,800 sq ft)**

**NMR Facility (6,000 net sq ft)**  
including **800 & 700 MHz**  
**Instruments**

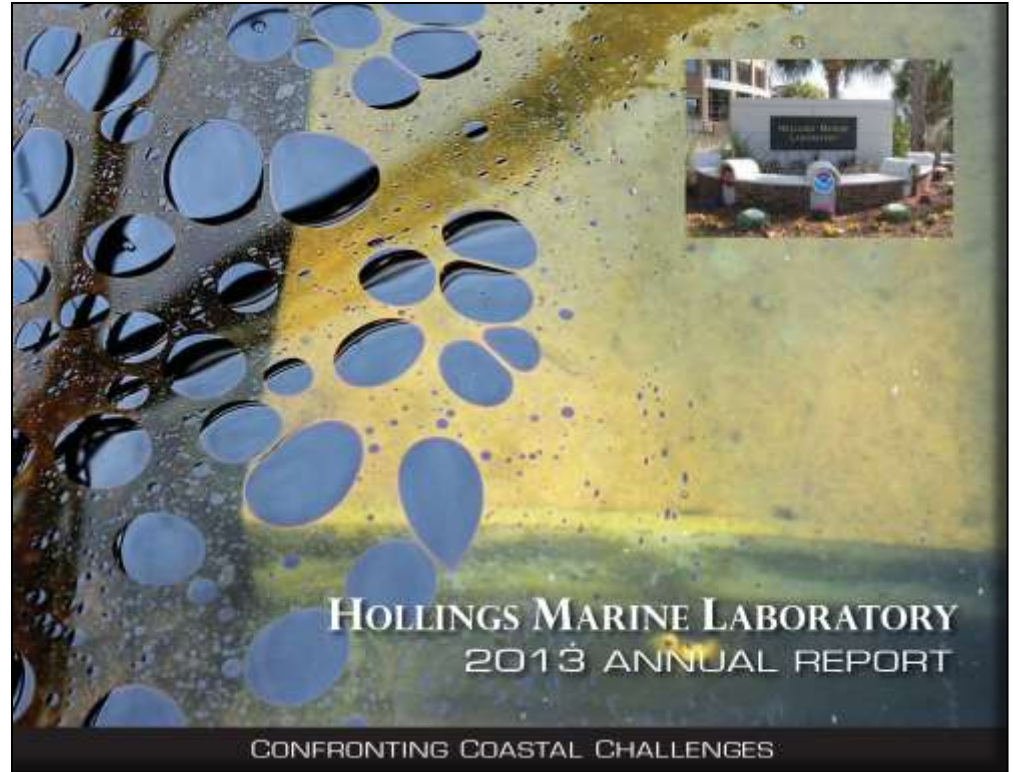


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## ***HML Mission:***

***To understand and forecast relations between coastal ecosystems and human health and well being***



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# HML 2013 Annual Report : The Deep Water Horizon Story – HML Partnership

## Mesocosm Studies

Oil and dispersants impacts in salt marsh ecosystems



## Social Science

Assessment of community well-being in counties impacted by oil spill



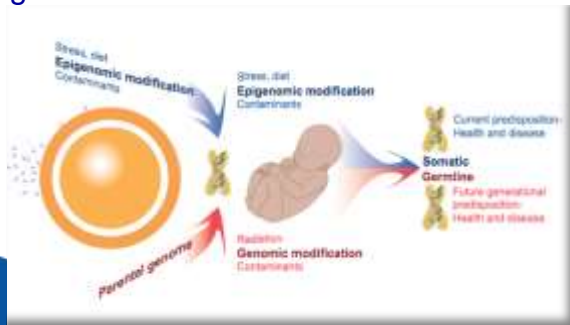
## Dolphin Health Assessments

Health of dolphins following the oil spill



## Environmental/Human Health Studies

Impacts of oil and dispersants on whale, dolphin, alligator and human stem cells



## Sample Banking and Preservation

Collection, measurements and archiving of samples / Holding 12,400 frozen samples from more than 1,200 animals associated with DWH oil spill



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# Threats to Marine Mammals in the Southeast U.S.

## HML & Ft. Johnson research focuses primarily on:

### Marine mammals as sentinels of ecosystem health

- Research funded by Oceans & Human Health Initiative
- Harmful Algal Bloom and Hypoxia Research & Control Act (HABHRCA)
- Partnership with Medical University of SC, SC DNR, NIST

### Coastal Research - Inshore & Coastal Bottlenose dolphins

- Year-round residents in estuaries along entire southeast coast
- Good integrative indicators for coastal ecosystem health
- Important apex predator & valued living marine resource

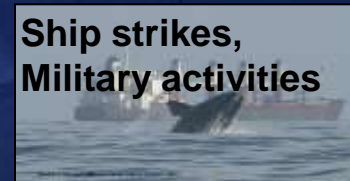
#### Fishery Interactions



#### Coastal Pollution



#### Ship strikes, Military activities



#### Climate



#### Human Interaction



**Industrial activities**  
e.g., noise, habitat loss, pollution



#### Harmful Algal Blooms



**Disease**  
e.g., morbillivirus





# Primary Research Areas Involving Marine Mammals

**Environmental health research (multi-species) focused on endocrine function and reproductive health (MUSC,NOAA,NIST)**

**Epidemiological and risk assessment studies to assess pollutant exposures, pathogens, and HABs, and associated health effects in coastal marine mammal populations (NOAA)**

**Molecular tools applied for marine mammals and other estuarine organisms, to understand gene-level responses to chemical and biological toxin exposures (NOAA/NCCOS, MUSC, NIST, SC DNR)**

**Specimen banking for understanding long-term temporal & spatial trends in marine mammal contaminant measures (NIST, NOAA)**



# Specific Examples of HML Partner Research With Application to Marine Mammals

## Next Session:

Lori Schwacke (NOAA) – NCCOS/HML's OHH Branch Chief

Fran Van Dolah (NOAA) – NCCOS/HML's Research Biochemist

Wayne McFee (NOAA) – NCCOS/CCEHBR's Wildlife Biologist

Paul Becker (NIST) – NIST Site Director

Lou Guillette (MUSC) – Director of MUSC's Marine Biomedicine and  
Environmental Sciences



# Contact Information

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**HML Website:**

**<http://coastalscience.noaa.gov/about/centers/hml>**

**CCEHBR Website:**

**<http://coastalscience.noaa.gov/about/centers/ccehbr>**



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