SUT - US

In collaboration with

CIGoM
Consorcio de Investigación del Golfo de México

Mexican Research Consortium
for the Gulf of Mexico

Emerging Data and Models from the Gulf of Mexico

Oceanographic Observational Platforms, Baseline Studies, Model Simulations, and Scenarios of the Natural Response to Large-Scale Oil Spills

Image credit: NOAA

What is CIGoM?

CIGoM is the largest oceanographic project ever undertaken in Mexican deep waters to implement networks of physical, geochemical, and ecological observations to generate scenarios and possible contingencies related to the exploration and production of hydrocarbon in deep sea waters in the Gulf of Mexico. This research project is funded by the Mexican Science Foundation (CONACYT-Hydrocarbons) and by Mexico's Department of Energy (SENER).

The Consortium's Objectives:

• Perform physical, chemical, and biological measurements to establish a baseline for the present-state and the natural variability of the greater ecosystem of the Gulf of Mexico.

• Use and develop cutting-edge technologies to observe the surface ocean continuously, in some cases in real-time, that could be used in the case of an oil spill, and which, together with numerical models, allows estimation of its dispersion and possible consequences.

• Build physical, biogeochemical, and transport models of hydrocarbons integrating degradation processes, to generate risk maps, arrival times, and estimates impacts in an efficient manner, taking into account the chemical characteristics of the hydrocarbons and the location and depth of possible large hydrocarbon spills.

The Mexican Institutions involved have more than 30 years of experience in the oceanographic and ecosystem research in the Gulf of Mexico.

Long record as Institutions of higher learning in ocean sciences.

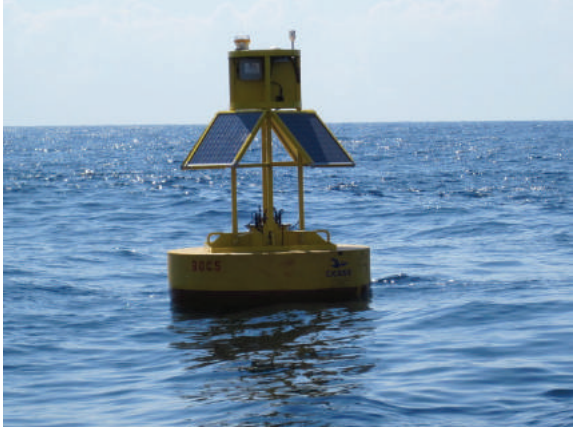
Associated with well established oceanographic research institutions in US and Europe.

Course Program

9:00am – 9:20am	**Welcoming, SUT - TAMU - CIGOM Collaborations** Dr. Zenon Medina-Cetina, Chair and President of SUT-US
9:20am – 9:50am	**Mexico's CIGOM Project** Dr. Juan Carlos Herguera, CIGOM Technical Director, CICESE
9:50am – 10:00am	**Coffee Break**
10:00am – 11:00am	**CIGOM Research Line 1 - Observational Platforms, ROV's and Gliders** Dr. Francisco Ocampo, CICESE Dr. Tomás Salgado, CIDESI
11:00am – 12:00pm	**CIGOM Research Line 2: Oceanographic and Ecosystem Baseline Studies and Monitoring** Dr. Sharon Herzka, CICESE Dr. Victor Vidal, CINVESTAV-Merida
12:00pm - 12:50pm	**Lunch**
12:50pm – 1:50pm	**CIGOM Research Line 3: Ocean and Atmospheric Modeling** Dr. Jorge Zavala, Atmospheric Sciences, UNAM
1:50pm - 2:50pm	**CIGOM Research Line 4: Biodegradation of Hydrocarbons** Dr. Alexei Licea, CICESE
2:50pm – 3:00pm	**Coffee Break**
3:00pm - 4:00pm	**CIGOM Research Line 5: Oil Spill Scenarios** Dra. Paula Perez Brunius, CICESE Dr. Victor Vidal, CINVESTAV-Merida
4:00pm - 5:00pm	**Q&A Session**
5:00pm	**Closing Remarks, SUT-US Event Announcements** Dr. Zenon Medina-Cetina, Chair and President of SUT-US

Workshop Research Themes

Oceanographic observational platforms, ROVs and gliders



Dr. Tomas Salgado
Dr. Francisco Ocampo

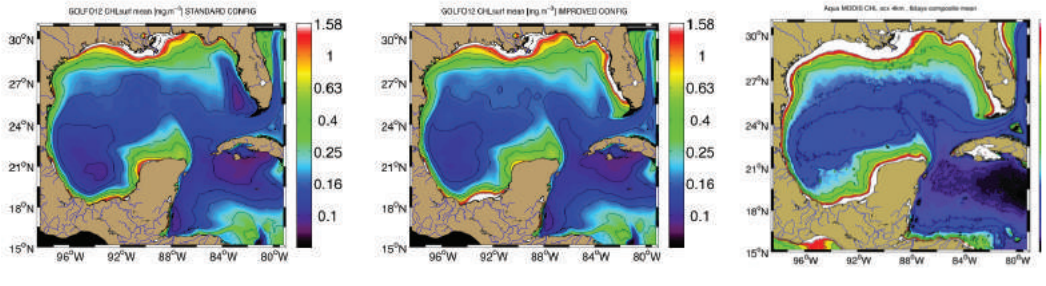
Deployment of observational platforms in continuous-time assimilating, novel and cutting-edge technologies, to carry out measurements of critical variables that can be used in the event of a spill event and that together with numerical models, will allow to estimate the possible fate and behavior of a spill.
Implementation of a systematic, continuous, fixed and mobile observational platforms, including; coastal and open ocean oceanographic buoys, deep-sea moorings, submarine gliders, network of high frequency radars, satellite image acquisition, multibeam mapping, development of gliders technology, and subsurface robotics, to measure parameters and key variables, to understand circulation processes and the biogeochemistry through the water column.

Baseline studies and environmental monitoring

Dr. Sharon Herzka
Dr. Victor Vidal

This topics relates to undertaking extensive environmental baseline surveys of key oceanographic, biogeochemical, biological and ecological variables of the southern Gulf of Mexico. The ambitious monitoring effort extends from the current platform locations to the deep water region, covering the entire water column and sediments, and bacteria to large pelagic organisms. The results of the monitoring effort will be integrated into databases that meet international standards and from which an ambitious Atlas will be produced. The baseline information generated in this research will be used to assess impacts and design mitigation strategies in the case of large-scale oil spills in the deep water region of Mexico's EEZ, and will contribute to the understanding of the processes that modulate the oceanographic behavior of the Gulf of Mexico.

Numerical modeling of the physics and biogeochemistry



Dr. Jorge Zavala

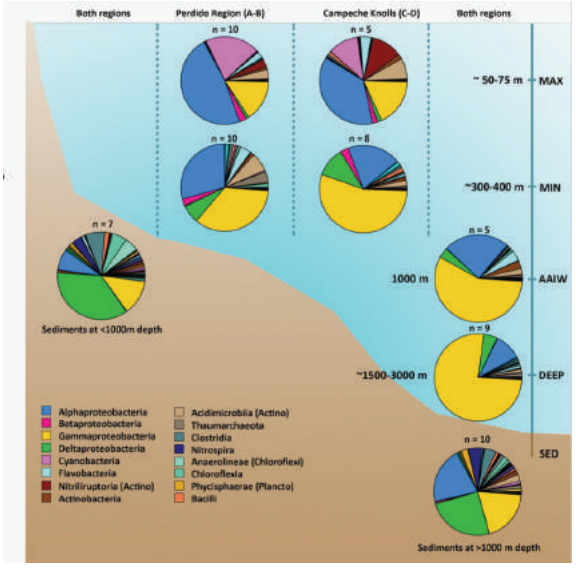
The development of computational ocean community models that integrate the main circulation, biogeochemical and ecological processes, to test and assess the evolution, fate and possible effects of large hydrocarbons spills under different scenarios. It includes the generation of numerical models of the circulation and dispersion of hydrocarbons, the development of forecasting capacity, and the construction of maps of vulnerability. Physical, biogeochemical and hydrocarbon transport models that incorporate weathering processes will be used to generate risk maps, arrival times and impact estimates in an efficient way, taking into account the chemical characteristics of hydrocarbons and the position and depth of possible spills.

Workshop Research Themes

Natural degradation of hydrocarbons

Dr. Alexei Licea

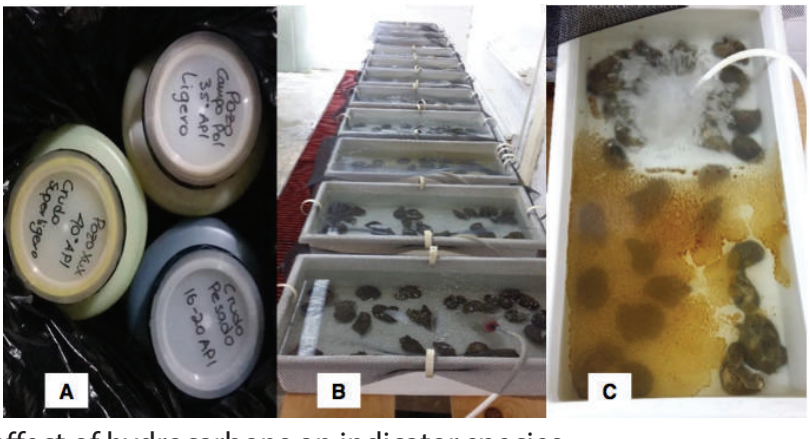
The characterization of the physicochemical, photochemical and native microflora degradation parameters on different hydrocarbon fractions, through laboratory experiments, and to explore the metabolic pathways of metagenomes, with emphasis on those related to hydrocarbon degradation. All of these information will be used for the development of empirical models that characterize the degradation of different hydrocarbon fractions at different depths (T and P) for their integration in a general computational model of degradation of hydrocarbons in the Gulf of México.



Analysis of spill scenarios

Dr. Paula Perez
Dr. Victor Vidal

Examine the possible consequences under different spill scenarios, using the "Perdido" region as a model system. The focus is on studying the dispersion and transport processes, and their possible impact on the ecosystem at different temporal and spatial scales.



- In situ and laboratory trials to measure the effect of hydrocarbons on indicator species
- Evaluation of the recovering capacity of keystone species in the Gulf of Mexico ecosystem under large spill scenarios
- Spatial distribution of vulnerability in the Gulf of Mexico

Location

January 11, 2018
9:00am - 5:00pm

Texas A&M Engineering Experiment Station
TEES Houston Office
15835 Park Ten Place, Suite 160
Houston, TX 77084

Cost

Members $150
Non-Members $200

*Cost includes
- Coffee and lunch
- 1 PDH Certificate of Completion per person

Contact Information

Communications@suthouston.com

Register at:

www.suthouston.com

CIGoM Speakers

Dr. Juan Carlos Herguera
Researcher
Scientific and High Education Research Center from Ensenada (CICESE) - Oceanography Division

Dr. Tomas Salgado
Researcher
Engineering and Industrial Development Center (CIDESI) - Energy Division

Dr. Sharon Herzka
Research Professor
Scientific and High Education Research Center from Ensenada (CICESE) - Deparment of Biological Oceanography

Dr. Victor Vidal
Parasite Ecologist and Senior Professor
Center for Research and Advanced Studies (CINVESTAV-IPN)

Dr. Alexei Licea
Researcher
Scientific and High Education Research Center from Ensenada (CICESE) - Applied and Experimental Biology Division

Dr. Jorge Zavala
Researcher
National Autonomous University of Mexico (UNAM) - Atmospheric Sciences

Dr. Francisco Ocampo
Oceanographer & Researcher Scientist
Scientific and High Education Research Center from Ensenada (CICESE) - Department of Physical Oceanography

Dr. Paula Perez
Researcher
Scientific and High Education Research Center from Ensenada (CICESE) - Department of Physical Oceanography

Co-Sponsors

GEOSCIENCES

ZACHRY DEPARTMENT OF CIVIL ENGINEERING
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SGL Stochastic Geomechanics Laboratory