



Rafael J. Ramos, Ph.D., M.S., B.S.
Senior Oceanographer/Ocean Engineer

Expertise

Process, analysis, and interpretation of environmental data from remote sensing and in situ sampling platforms including satellite-borne, vessel-borne, and shore based radar systems as well as buoy and subsurface mooring instrumentation. Design, set up, and deployment of systems for monitoring various atmospheric and oceanographic quantities. Extensive experience on implementation of mathematical/numerical models for data interpretation and assessment of their significance in the context of coastal dynamics, global circulation, air-sea flux exchange, storm (Hurricane) development, internal wave patterns, and other ocean and atmospheric phenomena. Also experienced in engineering design and requalification of fixed offshore rigs, including generation of risk-based criteria for their analysis under environmental loading.

Education

Ph.D. Applied Marine Physics -
2006 University of Miami
M.S. Ocean Engineering –
1995 Texas A&M University
B.S. Civil Engineering – 1989
Instituto Politécnico
Nacional

Professional Affiliation

American Society of Civil
Engineers – COPRI,
American Geophysical Union,
Marine Technology Society,
Society of Naval Architects and
Marine Engineers,
The Hydrographic Society of
America,
Academia Mexicana de
Ingeniería.

Publications and Presentations

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Qualification Summary

- More than 15 years of experience working on deployment of various system for monitoring atmospheric and oceanographic quantities as well as analysis, processing, and interpretation of related data.
- Software development for data acquisition, integration, analysis, and quality control for various instrumentations.
- Implementation of mathematical/computer models for data simulation and interpretation
- Processing and interpretation of satellite imagery to estimate environmental quantities and monitor surfactants on the ocean surface.
- 9 years of experience as design engineer, staff engineer, project manager and engineering research manager in the offshore oil industry.

Work Experience

2014-Present	Oceanographer/Ocean Engineer, Woods Hole Group
2006-2014	Center for Southeastern Tropical Advanced Remote Sensing, University of Miami (Post-doctoral Associate)
1999-2006	University of Miami, Rosenstiel School of Marine and Atmospheric Science, (Research Assistant)
1995-1999	Instituto Mexicano del Petróleo, Mexico (Engineering Research Manager)
1989-1993	Instituto Mexicano del Petróleo, Mexico (Staff Engineer, Offshore Oil Rig Division)

Key Projects

Metocean Buoy for ECOPETROL, Offshore Colombia, Caribbean Sea

A Real-Time Metocean Mooring was installed offshore Colombia in response to a request from ECOPETROL to acquire atmospheric, meteorological and oceanographic data needed to support oil and gas exploration and future production activities in the Caribbean Sea. The system has been designed, assembled, tested, and deployed, and it is currently in operation providing real-time data to ECOPETROL through a dedicated telemetry receiving system and webserver. Dr. Ramos has participated in the various faces of the project, including system maintenance and quality control of the data. He also serves as liaison with the client and local partners.

Improving LCE Current Profile Representation, CASE-EJIP, Gulf of Mexico

This project sponsored by the Climatology and Simulation of Eddies (CASE) – Eddy Joint Industry Project (EJIP) was aimed to perform a comprehensive assessment of the uncertainty of the Gulf Eddy Model (GEM) current predictions and the validity of the underlying assumptions. Disagreement between model results and observation of currents induced by Loop Current Eddies (LCEs) were found to be related to over-simplified considerations of current speed distribution at the eddy core and eddy shape parametrization. Dr. Ramos was one of the leading scientists in this effort.

RIVET 2012 (New River Inlet Direct Research initiative, New River, NC

RIVET 2012 was a multi-institution research project funded by the Office of Naval Research (ONR) that aimed to study the dynamics of New River Inlet including river flow impact on coastal processes. Dr. Ramos participated in the calibration and deployment of instrumentation on board an innovative platform known as SPEC (Surface, Physics Experimental Catamaran). He was responsible for data processing, analysis, quality control, and interpretation.

ITOP 2010 Experiment (Impact of Typhoons on the Ocean in the Pacific), offshore Taiwan

The ITOP 2010 program was a multi-disciplinary, multi-institution, multi-national field campaign (funded by ONR) focused on the study of ocean response to typhoons in the western Pacific Ocean. Dr. Ramos participated in calibration, deployment, and retrieval of 4 monitoring buoy systems (ASIS and EASI) that recorded the first ever direct measurements of momentum fluxes in typhoons. He was responsible for data integration, processing, analysis, quality control, and interpretation.

SW06 Non-Linear Internal Wave Initiative (NLIWI), New Jersey

The Shallow Water 2006 experiment (part of the ONR funded NLIWI) was a multi-disciplinary, multi-institution, multi-national effort carried out offshore New Jersey that was aimed to study internal waves and their interaction with various acoustic frequencies. Dr. Ramos was involved in the deployment and retrieval of 2 monitoring buoys (ASIS) and other oceanographic moorings. He was responsible for data processing, analysis, and interpretation including ocean surface measurements using X-Band radar.

Deep Water Horizon Oil Spill

The Center for Southeastern Tropical Advance Remote Sensing (CSTARS) of the University of Miami participated intensively in the daily monitoring of the Deep Water Horizon Oil Spill by providing reports to governmental agencies and oil industry representatives. Dr. Ramos was part of the response team and was responsible for the analysis and interpretation of related satellite imagery. The collaboration effort was awarded the 2011 Science & Technology Award by the Department of Home Land Security.

Key Projects (continued)

Design and Assessment Criteria for Offshore Platforms in Bay of Campeche

Dr. Ramos coordinated and managed a multi-institutional project for the generation of risk-based design and assessment criteria for offshore platforms in Bay of Campeche (Southern Gulf of Mexico). This effort followed from registered damage in the Mexican offshore oil infrastructure after the passage of Hurricane Roxanne (1995) and from the major implications of potential production shut down to comply with outdated recommended practices in the area. Dr. Ramos has participated as a consultant in later criteria revisions.

Publications and Presentations

- Drennan, W. M., H. C. Graber, C. O. Collins, A. Herrera, H. Potter, R. J. Ramos, and N. J. Williams. 2014. "EASI: An Air-Sea Interaction Buoy for High Winds," *Journal of Atmospheric and Oceanic Technology*, 31, 1397-1409.
- Potter, H., H. C. Graber, N. J. Williams, C. O. Collins, R. J. Ramos, and W. M. Drennan. 2014. "In Situ Measurements of Momentum Fluxes in Typhoons." *Journal of Atmospheric Sciences*, 72, 104-118.
- Collins, C. O., B. Lund, R. J. Ramos, H. C. Graber, W. M. Drennan, and N. J. Williams. 2014. Multi-Sensor Wave Parameter Intercomparison during the ITOP Experiment, *Journal of Atmospheric and Oceanic Technology*, 31, 2309-2329.
- Drennan, W. M., Graber, H. C., Collins III, C. O., Herrera, A., Potter, H., Ramos, R. J., Williams, N. J. 2014. "EASI: An air-sea interaction buoy for high winds," *Journal of Atmospheric and Oceanic Technology*, 31, pp 1397-1409.
- Williams, N. J., W. M. Drennan, H. C. Graber, R. J. Ramos, I. M. Brooks, S. J. Norris, and D. A. Sproson. 2012. "Air-Sea Measurements from Moored Surface Buoys in the Pacific During the 2010 Typhoon Season." Ocean Sciences Meeting, S091-B1904, Salt Lake City, Utah, 2012.
- Ramos, R. J., H. C. Graber, W. M. Drennan, and N. J. Williams. 2012. "Wind Measurements from ASIS and EASI Buoys During the ITOP Experiment", Ocean Sciences Meeting, S091-B1819, Salt Lake City, Utah, 2012.
- Potter, H., W. M. Drennan, M. M. Gierach, H. C. Graber, R. J. Ramos, N. J. Williams, and C. O. Collins. 2012. "Upper Ocean Response to Typhoons During the 2010 Season." Ocean Sciences Meeting, S091-B1820, Salt Lake City, Utah, 2012.
- Lund, B., H. C. Graber, W. M. Drennan, N. J. Williams, R. J. Ramos, C. O. Collins, A. Herrera, and E. J. Terrill. 2012. "Wind and Wave Retrieval from Marine X-Band Radar Data Under Typhoon Conditions." Ocean Sciences Meeting, S091-B1821, Salt Lake City, Utah, 2012.
- Collins, C. O., H. C. Graber, W. M. Drennan, N. J. Williams, R. J. Ramos, B. Lund, B., and A. Herrera. 2012. "In Situ Measurements of Surface Gravity Waves in Typhoon Conditions." Ocean Sciences Meeting, S091-B1822, Salt Lake City, Utah, 2012.
- Haus, B. K., L. K. Shay, P. Work, G. Voulgaris, R. J. Ramos, and J. Martinez-Pedraja. 2010. "Wind Speed Dependence of Single Site Wave Height Retrievals from High Frequency Radars." *AMS Journal of Atmospheric and Oceanic Technology*, 27(8), 2010, pp 1381-1394.

Publications and Presentations (continued)

- Ramos, R. J., B. Lund, and H. C. Graber. 2009. "Determination of Internal Wave Properties from X-Band Radar Observations," *Ocean Engineering*, 36, 2009, pp. 1039-1047.
- Ramos, R. J., H. C. Graber, and B. K. Haus. 2009. "Observation of Wave Energy Evolution in Coastal Areas Using HF Radar." *AMS Journal of Atmospheric and Oceanic Technology*, September 2009, pp 1891-1909.
- Haus, B. K., R. Ramos, H. C. Graber, L. K. Shay, and Z. R. Hallock. 2006. "Remote Observation of the Shoaling of Surface Waves Propagating into an Estuarine Flow." *IEEE Journal of Oceanic Engineering*, 31(4), 2006.
- Haus, B. K., H. C. Graber, R. J. Ramos. 2003. "Refraction and Shoaling of Surface Waves by Currents and Topography as Observed by HF Radars." *Proceedings of the IEEE Working Conference on Current Measurement Technology*, March 13-15, 2003, pp. 115-118.
- Zhaohui J., R. Bea, J. Suhayda, and R. Ramos. 2000. "Reduction of Hurricane Wave Heights in Shallow Water by Deformable Sea Floor Soils Offshore Mexico." *Offshore Mechanics and Arctic Engineering Conference*, New Orleans, Louisiana, 2000.
- Bea R. G., T. Xu, J. Stear, and R. Ramos. 1999. "Wave Forces on Decks of Offshore Platforms." *Journal of Waterway, Port, Coastal, and Ocean Engineering*, 125-3, May/June 1999.
- Soriano A., R. Ramos, E. Heredia, and R. Bea. 1999. "Assessment of Biases & Uncertainties in Design & Requalification Parameters for Offshore Platforms." *9th International Offshore and Polar Engineering Conference & Exhibition*, Brest, France, May-June 1999.
- Ramos R., F. Perez, and R. Ortega. 1998. "Mexico Engineering Experiences and Developments." *OMAE International Workshop on Platform Requalification*, Lisbon, Portugal, July 1998, (published later in the *Journal of the Offshore Mechanics and Arctic Engineering*).
- Cardone V. J. and R. Ramos. 1998. "Wave, Wind and Current Characteristics of Bay of Campeche." *Offshore Technology Conference*, Houston, Texas, May 1998.
- Bea R. G., R. Ramos, O. Valle, V. Valdes, and R. Maya. 1998. "Risk Assessment & Management Based Hurricane Wave Criteria for Design and Requalification of Platforms in the Bay of Campeche." *Offshore Technology Conference*, Houston, Texas, May 1998.
- Bea R. G., R. Ramos R, T. Hernandez, O. Valle O, V. Valdes, and R. Maya. 1998. "Risk Assessment & Management Based Criteria for Design and Requalification of Pipelines and Risers in the Bay of Campeche." *Offshore Technology Conference*, Houston, Texas, May 1998.
- Ramos R., G. Inda, and R. Ortega. 1997. "Evaluacion Sismica de Varias Estructuras Especiales (*Earthquake Assessment of Several Special Structures (Offshore Structures)*)." *XI Congreso Nacional de Ingenieria Sismica*, Veracruz, Mexico, November 1997.
- Ramos R., G. Inda, A. Soriano, R. Ortega, O. Valle, E. Heredia, M. Chavez, and R. Bea. 1997. "Criterio Sismico Transitorio para la Evaluacion de Plataformas Marinas (*Interim Earthquake Criteria for assessment of Offshore Platforms (in Bay of Campeche)*)." *XI Congreso Nacional de Ingenieria Sismica*, Veracruz, Mexico, November, 1997.

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- Ramos R. J. and J. Zhang. 1996. "Prediction of Low-Frequency Offshore Structure Response to Irregular Waves Using Linear and High-Order Wave Theories." SPE International Petroleum Conference and Exhibition of Mexico, Villahermosa, Mexico, 1996.
- Martinez-Gonzales J. L., R. Ramos, and J. Silva. 1996. "Dynamics of Systems with Rigid Body Modes: A Numerical Approach." 6th International Offshore and Polar Engineering Conference, Los Angeles, California, 1996.
- Ramos R., R. Ortega, and O. Valle. 1996. "Evaluacion Preliminar de la Integridad Estructural de Plataformas Marinas debido a los Efectos del Paso del Huracan Roxana (*Preliminary Assessment of (Bay of Campeche) Offshore Platforms due to the influence of Hurricane Roxanne*)." X Congreso Nacional de Ingenieria Estructural, Mérida, Mexico, 1996.
- Ramos, R. J. and J. Zhang. 1995. "Comparisons on TLP Response to Irregular Waves Using Linear and High-Order Wave Theories." IX International Symposium on Offshore Engineering, Rio de Janeiro, Brazil, September 1995.
- Ramos, R. J., H. C. Graber, and B. K. Haus. 2008. "Observation of Wave Energy Evolution in Coastal Areas using HF Radar." 8th Radio Oceanography Workshop, Honolulu, Hawaii, 2008.
- Caruso, M. J., N. J. Williams, B. Lund, R. J. Ramos, and H. C. Graber. 2008. "Remote Sensing of Internal Waves in the Mid-Atlantic Bight." Ocean Sciences Meeting, Orlando, Florida, 2008.
- Williams, N. J., H. C. Graber, M. J. Caruso, R. J. Ramos, and B. Lund. 2008. "Comparison of In-Situ Surface Measurements of Non-Linear Waves with Those Obtained From Remote Sensing." Ocean Sciences Meeting, Orlando, Florida, 2008.
- Ramos, R. J., H. C. Graber, B. Lund, M. J. Caruso, and N. J. Williams. 2008. "Determination of Internal Wave Properties from X-Band Radar Observations." Ocean Sciences Meeting, Orlando, Florida, 2008.
- Williams, N. J., H. C. Graber, and R. Ramos. 2006. "Near-surface Measurements of Internal Waves During the Non-Linear Internal Wave Initiative Experiment (NLWI)." American Geophysical Union Fall Meeting – Ocean Sciences, San Francisco, California, 2006.
- Ramos, R. and H. C. Graber. 2005. "Wavelet Filtering of Significant Wave Height Estimates from HF Radar Measurements." 5th Radio Oceanography Workshop, Costanoa, California, 2005.