



**FERNANDO GILBES-SANTAELLA**  
**DEPARTMENT OF GEOLOGY**  
**UNIVERSITY OF PUERTO RICO AT MAYAGÜEZ**  
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### **EDUCATION**

- 1996 Ph.D. in Oceanography, University of South Florida
- 1992 M.S. in Marine Sciences, University of Puerto Rico at Mayagüez
- 1988 B.S. in Biology, University of Puerto Rico at Mayagüez

### **ACHIEVEMENTS AND AWARDS**

- 1998 Sackett Prize for Innovative Research  
Department of Marine Science, University of South Florida
- 1998 Cited in Who's Who in Science and Engineering. 4th Edition
- 1995 Fellowship in the Global Change Research Program  
NASA Grant No. NGT-30316
- 1992 Fellowship in the Graduate Student Researchers Program  
NASA Grant No. NGT-70260
- 1989 Fellowship in the Graduate Student Researchers Program  
NASA Grant No. NGT-70099
- 1993 JPL Summer Scholarship to attend the course "Processes of Global Change"  
NASA Earth Science Summer School
- 1992 BBSR Summer Scholarship to attend the course "Remote Sensing in Oceanography"  
Bermuda Biological Station for Research
- 1991 Young Investigator Award to attend the course "Primary Productivity in the Sea"  
Brookhaven National Laboratory

### **WORK EXPERIENCE**

- Aug 09-Present Director, UPRM-Department of Geology
- Jul 05-Present Associate Professor, UPRM-Department of Geology
- Aug 03-Present Director, UPRM-Center for Hemispherical Cooperation in Research and Education in Engineering and Applied Science (CoHemis)
- Jan 02-Jun 05 Assistant Professor, UPRM-Department of Geology
- Aug 02-Jul 03 Co-Director, UPRM- CoHemis

Oct 00-Dec 01 Post-Doctoral Investigator, UPRM  
Center for Subsurface Sensing and Imaging Systems (CenSSIS)

Jan 98-Dec 01 Post-Doctoral Investigator, UPRM  
Tropical Center for Earth and Space Studies (TCESS)

Jan 97-Dec 00 Post-Doctoral Investigator, UPRM-Department of Marine Sciences

Aug 92-Dec 96 Research Assistant in Remote Sensing  
Department of Marine Science, University of South Florida

Apr 90-Jul 92 Biological Assistant & Clerk, Cabo Rojo National Wildlife Refuge  
U.S. Fish and Wildlife Service, Caribbean Field Office, Boquerón, P. R.

Aug 90-May 91 Research Advisor (International Scientific Fair)  
Science Research Academy for Gifted Students  
Inter American University-San Germán Campus, San Germán, P. R.

January 1991 Consultant to U.S. Geological Survey, USGS - Caribbean Office

May-Dec 88 Research Assistant in Phytoplankton Dynamics  
Center for Energy and Environment Research, Marine Ecology Division

Jul-Aug 87 Biological Technician (Wildlife), U.S. Fish and Wildlife Service  
Caribbean Field Office - Boquerón, P. R.

Aug 86-May 88 Volunteer of the Scientific Research Auxiliaries Corps  
Department of Natural Resources, Chapter of Ponce, Puerto Rico

Summer 1986 Field Work Assistant (Wildlife), U.S. Fish and Wildlife Service  
Cabo Rojo National Wildlife Refuge

Aug 85-Jun 86 Biology Workshop Assistant, UPRM-Department of Biology

Summer 1985 Research Assistant (Water and Soil Quality), UPRM-Dep. of Biology

### **TEACHING EXPERIENCE**

Aug 03-Present GEOL 6993 - Special Topics in Remote Sensing

Aug 02-Present GEOL 6225 – Advanced Geological Remote Sensing  
GEOL 4048 - Geological Applications of Remote Sensing

Jan 02-Present GEOL 3105 - Images of the Earth  
GEOL 4049/4055 - Undergraduate Research

Summer 2004 NOAA-NCAS Advanced Course of Remote Sensing

Aug 98-Dec 01 CMOF 6445 - Oceanographic Remote Sensing I  
CMOF 8446 - Oceanographic Remote Sensing II

December 2002 Bio-Optical Oceanography and Satellite Remote Sensing  
Facultad de Ciencias, Universidad de la República, Uruguay

November 2000 Bio-Optical Oceanography and Satellite Remote Sensing  
Facultad de Ciencias Exactas y Naturales  
Universidad Nacional del Mar Del Plata, Argentina

July 1997                      Remote Sensing in Coastal Environments  
 Instituto Geográfico Agustín Codazzi  
 Santa Fe De Bogotá, Colombia

## PUBLICATIONS

- Rodríguez-Guzmán, V., **F. Gilbes-Santaella** (2009) Estimating Total Suspended Sediments in Tropical Open Bay Conditions using MODIS. In: Proceedings of the 8th WSEAS International Conference on Instrumentation, Measurement, Circuits and Systems, Hangzhou, China, May 20-22, 2009, pp 83-86.
- Guild, L., B. Lobitz, R. Armstrong, **F. Gilbes**, J. Goodman, Y. Detres, R. Berthold<sup>1</sup>, and J. Kerr (2008) NASA Airborne AVIRIS and DCS Remote Sensing of Coral Reefs. In: Proceedings of the 11th International Coral Reef Symposium, Ft. Lauderdale, Florida, 7-11 July 2008, Session number 17, pp 1-5.
- Armstrong, R.A., H. Singh, S. Rivero, and **F. Gilbes** (2008) Monitoring Coral Reefs in Optically-Deep Waters. In: Proceedings of the 11th International Coral Reef Symposium, Ft. Lauderdale, Florida, 7-11 July 2008, Session number 17, pp 1-5.
- Torres J.L., R.A. Armstrong, J.E. Corredor, and **F. Gilbes** (2007) Physiological Responses of *Acropora cervicornis* to Increased Solar Irradiance, *Journal of Photochemistry and Photobiology*, 83:839-850.
- Guild, L., B. Lobitz, R. Armstrong, **F. Gilbes**, A. Gleason, J. Goodman, E. Hochbergg, M. Monaco, and R. Berthold (2007) NASA Airborne AVIRIS and DCS Remote Sensing of Coral Reefs. In: Proceedings of 32<sup>nd</sup> International Symposium on Remote Sensing of Environment, San Jose, Costa Rica, June 25-29, 2007, pp. 1-4.
- Gilbes F.**, R.A. Armstrong, J. Goodman, M. Velez, S. Hunt (2006) CenSSIS SeaBED: Diverse Approaches For Imaging Shallow And Deep Coral Reefs. In: Proceedings of Ocean Optics XVIII, Montreal, Canada, October 9-13, 2006, pp. 1-8.
- Schellekens, J.H., **F. Gilbes**, G.D. Rivera, Y.C. Ysa, S. Chardon, Y. Fong (2005) Reflectance spectra of tropical vegetation as a response to metal enrichment in the substrate of West-central Puerto Rico, *Caribbean Journal of Earth Sciences*, 39:9-12.
- Ramirez-Beltran, N.D., **F. Gilbes**, J.M. Castro. (2004) A stochastic-Dynamic Model to Predict Fecal Coliforms at the Mouth of the Añasco River, Coastal Environment V, Incorporating Oil Spill Studies. C.A. Brebbia J.M. Saval Perez, and L. Garcia Audion (Editors), WIT Press.
- Singh, H., R. Armstrong, **F. Gilbes**, R. Eustice, C. Roman, O. Pizarro, J. Torres (2004) Imaging Coral I: Imaging Coral Habitats With The SeaBED AUV, *Subsurface Sensing Technology and Applications*, 5(1):25-42.
- Gilbes, F.** and R. A. Armstrong (2004) Phytoplankton Dynamics In The Eastern Caribbean Sea As Detected With Space Remote Sensing. *International Journal of Remote Sensing*, 25(7-8): 1449-1452.
- Armstrong, R.A., **F. Gilbes**, R. Guerrero, C. Lasta, and H. Miazán. (2004) Validation Of SeaWiFS-Derived Chlorophyll For The Rio De La Plata Estuary And Adjacent Waters. *International Journal of Remote Sensing*, 25(7-8):1501-1505.
- Gilbes, F.**, R. Armstrong, R.L. Miller, C.E. Del Castillo, M. Rosado, and N. Ramirez (2002) Bio-Optical Evidence Of Land-Sea Interactions In The Western Coast Of Puerto Rico. In: Proceedings of Ocean Optics XVI, Santa Fe, Nuevo Mexico, pp. 1-12.

- Lee-Borges, J., **F. Gilbes** and R.A. Armstrong (2002) Seawifs Validation At The Caribbean Time Series Station. In: Proceedings of Ocean Optics XVI, Santa Fe, Nuevo Mexico, pp. 1-7.
- Jiménez-Rodríguez, L. O., E. Rodríguez-Díaz, M. Velez-Reyes, **F. Gilbes**, C. A. DiMarzio. (2002) Automatic Coral Reef Detection By The Application Of Tikhonov Regularization To Inverse Modeling In Hyperspectral Images. In: Ocean Remote Sensing and Applications, Proceedings of SPIE, Vol. 4892.
- Gilbes, F.**, F. E. Müller-Karger, and C. E. Del Castillo. (2002) New Evidence For The West Florida Shelf Plume. *Continental Shelf Research*, 22:2479-2496.
- Gilbes, F.**, R. A. Armstrong, R. M. Webb, and F. E. Müller-Karger (2001) Seawifs Helps Assess Hurricane Impact On Phytoplankton In Caribbean Sea. *EOS, Transactions, American Geophysical Union*, 82(45):529 and 533.
- Alfonso, E., J. M. López, A. Dieppa, **F. Gilbes**, J. E. Corredor, J. M. Morell (2001) Trayectoria Anual De La Producción Primaria Diaria En El Caribe Oriental (Programa CaTS). Electronic version of the journal titled "Serie Oceanológica".
- Cruz-Pol, S., M. Velez-Reyes, S. Hunt, H. Parsiani, J. Colon-Ustariz, L.O. Jimenez, R. Vasquez, and **F. Gilbes**. (2001) The Laboratory For Applied Remote Sensing And Image Processing At The University Of Puerto Rico At Mayagüez. *IEEE Geoscience and Remote Sensing Society Newsletter*, 121:15-19.
- Gilbes, F.** and R. A. Armstrong (2000) Inherent Optical Properties At The Caribbean Time Series Station (CaTS). In: Proceedings of Ocean Optics XV, Monaco, pp. 1-13.
- Armstrong, R. A., J. M. López, and **F. Gilbes** (2000) Apparent Optical Properties At The Caribbean Time Series Station (CaTS). In: Proceedings of Ocean Optics XV, Monaco, pp. 1-5.
- Del Castillo, C. E., **F. Gilbes**, P. G. Coble and F. E. Müller-Karger (2000) On The Dispersal Of Riverine Colored Dissolved Organic Matter (CDOM) Over The West Florida Shelf. *Limnology and Oceanography*, 45(6):1425-1432.
- Del Castillo, C. E., **F. Gilbes**, P. G. Coble and F. E. Müller-Karger (1998) Optical Characteristics Of Dissolved Organic Matter During A Bloom On The West Florida Shelf. In: Proceedings of Ocean Optics XIV, Kailua-Kona, Hawaii, pp. 1-6.
- Gilbes, F.** and J. I. Vélez-Arocho (1998) The Caribbean Countries And The Inter-American Institute For Global Change Research. National Printers Inc., Mayagüez, P.R. 151 pp.
- Gilbes, F.**, C. Tomas, J. J. Walsh, and F. E. Müller-Karger (1996) An Episodic Chlorophyll Plume On The West Florida Shelf. *Continental Shelf Research*, 16(9):1201-1224
- Gilbes, F.**, J. M. López, and P. M. Yoshioka (1996) Spatial And Temporal Variations Of Phytoplankton Chlorophyll-A And Suspended Particulate Matter In Mayagüez Bay, Puerto Rico. *Journal of Plankton Research*, 18(1):29-43.
- Gilbes, F.** (1987) Cowbirds Control Project In Roosevelt Roads, Ceiba, Puerto Rico. U.S. Fish and Wildlife Service, Caribbean Field Office. Final Project Report, 50 pp.

## MEETING PRESENTATIONS

- Gilbes, F.** and R. Armstrong (2009) Remote Sensing of Benthic Habitats in Southwestern Puerto Rico, XXVIII Symposium of Caribbean Flora and Fauna, University of Puerto Rico at Humacao, Puerto Rico.

- Gilbes, F.** and W. Hernández (2008) New Web Tool for Understanding Bioluminescent Bays, Oral Presentation, 3<sup>rd</sup> Annual Symposium for Coastal and Marine Applied Research, University of Puerto Rico Sea Grant College Program, Mayagüez, Puerto Rico.
- Gilbes F.**, V. Rodriguez, J. Martinez, and E. Gonzalez (2008) Monitoring Suspended Sediments In Mayaguez Bay Using Remote Sensing, Oral Presentation, 24<sup>th</sup> Annual Symposium of Caribbean Geology, Mayagüez, Puerto Rico.
- Gilbes, F.**, W. Hernández, N. Hernández, J. Martínez, and V. Rodriguez (2008) MODIS Validation for Water Quality Parameters in Mayagüez Bay, Oral Presentation, Annual NOAA-CREST Symposium, Mayagüez, Puerto Rico.
- Hernández, W. J. and **F. Gilbes** (2007) GERSVIEW: A New Database for Web Mapping, Oral Presentation, 5<sup>th</sup> Conference of ESRI Users in Puerto Rico, Caguas, Puerto Rico.
- Schellekens, J.H., **F. Gilbes**, A. Rodriguez, and B. Deliz (2007) Developing A Protocol To Use Remote Sensing As A Cost Effective Tool To Monitor Contamination Of Mangrove Wetlands, Oral Presentation, Annual Symposium of the Puerto Rico Department of Natural and Environmental Resources, San Juan, Puerto Rico.
- Torres, D., S. Adréfouët, **F. Gilbes**, and F. Müller-Karger (2007) Comparing Methods and Sensors for Coral Reef Habitat Mapping in South Florida, USA. Oral Presentation, 32<sup>nd</sup> International Symposium on Remote Sensing of Environment, San Jose, Costa Rica.
- Guild, L., B. Lobitz, R. Armstrong, **F. Gilbes**, A. Gleason, J. Goodman, E. Hochbergg, M. Monaco, and R. Berthold (2007) NASA Airborne AVIRIS and DCS Remote Sensing of Coral Reefs. Oral Presentation, 32<sup>nd</sup> International Symposium on Remote Sensing of Environment, San Jose, Costa Rica.
- Zayas, C., **F. Gilbes**, R. Armstrong, and M. López (2007) Mapping Benthic Communities in Southwestern Puerto Rico using IKONOS. Poster Presentation, ASLO 2007 Aquatic Sciences Meeting, Santa Fe, New Mexico.
- Gilbes F.**, R.A. Armstrong, J. Goodman, M. Velez, S. Hunt (2006) CenSSIS SeaBED: Diverse Approaches For Imaging Shallow And Deep Coral Reefs. Poster Presentation, Ocean Optics XVIII Conference, Montreal, Canada.
- Gilbes, F.** and Chiques, G. (2005) Spectral Characterization of Sandy Beaches in Western Puerto Rico. Oral Presentation, 17th Caribbean Geological Conference, San Juan, PR.
- Arce, J., **Gilbes, F.**, and Goodman, J. (2005) Validation of Remote Sensors for Benthic Habitats Studies in Southwestern Puerto Rico. Poster Presentation, 8th International Conference of Remote Sensing for Marine and Coastal Environments, Halifax, Nova Scotia.
- Gilbes, F.** and Arce, J. (2004) Remote Sensing of Benthic Habitats in Southwestern Puerto Rico. Oral Presentation, ASLO/TOS Ocean Research Conference, Honolulu, Hawaii.
- Gilbes, F.**, Armstrong, R., Miller, R.L., Del Castillo, C.E., Rosado, M., and Ramirez, N. (2002) Bio-Optical Evidence of Land-Sea Interactions in the Western Coast of Puerto Rico. Oral and Poster Presentation, Ocean Optics XVI Meeting, Santa Fe, Nuevo Mexico.
- Lee-Borges, J., **Gilbes, F.**, and Armstrong, R. (2002) SeaWiFS Validation at the Caribbean Time Series Station. Poster Presentation, Ocean Optics XVI Meeting, Santa Fe, Nuevo Mexico.
- Rosado, M., **Gilbes, F.**, Armstrong, R. and Lee-Borges, J. (2002) Validation of Bio-Optical Algorithms in the Western Coast of Puerto Rico. Poster Presentation, Ocean Optics XVI Meeting, Santa Fe, Nuevo Mexico.

- Schellekens, J.H., **Gilbes, F.**, Rivera-Rivera, G.D. and Ysa, Y. (2002) Remote sensing of mineral deposits in tropical terranes. Porphyry copper deposits in west-central Puerto Rico. Oral Presentation, 16<sup>th</sup> Caribbean Geological Conference, Barbados.
- Gilbes, F.** (2002) Percepción Remota: Una Forma Diferente de Observar Nuestro Planeta. Oral Presentation, BIOS '02, La biología revolucionando el nuevo siglo. UPRM-Departamento de Biología. 1-mayo-02.
- Schellekens, J.H., **Gilbes, F.**, Rivera-Rivera, G.D., Chardon. S., Fong, Y., and Ysa, Y. (2002) Remote sensing of Metal Enriched Areas in Tropical Terranes. - Differences in Vegetation Reflectance. Oral presentation, 22<sup>nd</sup> Anniversario de Casa Pueblo, Adjuntas, PR.
- Gilbes, F.** (2002) Percepción Remota: Una forma diferente se Observar la Tierra. Presentación Oral, Simposio de Ciencias y Tecnología. Programa Upward Bound Ciencias y Matemáticas. Universidad Interamerica de Puerto Rico, Recinto de Ponce. 12-abril-2002
- Gilbes, F.** (2002) Hyperspectral Remote Sensing of Coral Reefs. Oral Presentation, Research and Industrial Collaboration Conference of the Center for Subsurface Sensing and Imaging Systems. Northeastern University, Boston, MA. January 29-30, 2002
- Schellekens, J.H., **Gilbes, F.**, Rivera-Rivera, G.D., and Ysa, Y. (2001) Remote sensing of mineral deposits in tropical terranes. Porphyry copper deposits in west-central Puerto Rico Poster Presentation, PRSGC First Congress on Integrating NASA Research and Education Projects in Puerto Rico, Hyatt Regency Cerromar Beach Resort. November 14-17, 2001
- Gilbes, F.** and Armstrong, R. (2000) Space Remote Sensing Of The Eastern Caribbean Sea. Poster Presentation) Oceans From Space Meeting, Venice, Italy.
- Armstrong, R. and **Gilbes, F.** (2000) Validation of SeaWiFS Chlorophyll Algorithm For The Rio De La Plata Estuary. Poster Presentation, Oceans From Space Meeting, Venice, Italy.
- Gilbes, F.** and Armstrong, R. (2000) Inherent Optical Properties At The Caribbean Time Series Station (CaTS). Poster Presentation, Ocean Optics XV Meeting, Monaco.
- Armstrong, R. and **Gilbes, F.** (2000) Apparent Optical Properties At The Caribbean Time Series Station (CaTS). Oral Presentation, Ocean Optics XV Meeting, Monaco.
- Del Castillo, C., **Gilbes, F.** and Coble, P. (1998) Optical Characteristics Of Dissolved Organic Matter During A Bloom On The West Florida Shelf. Poster, Ocean Optics XIV, Hawaii.
- Gilbes, F.** (1996) Analysis of Episodic Phytoplankton Blooming and Associated Oceanographic Parameters on the West Florida Shelf using Remote Sensing and Field Data. Ph.D. Dissertation, University of South Florida, 138 pp.
- Gilbes, F.** and Armstrong, R. (1996) AVHRR Detection of Orinoco River Plume Waters In The Eastern Caribbean Sea. Oral Presentation, ASLO Ocean Sciences Meeting, California.
- Gilbes, F.** (1992) The Relationship Between Phytoplankton Chlorophyll-A and Suspended Particulate Matter in Mayagüez Bay, Puerto Rico. Master Thesis, UPR-Mayagüez, 53 pp.
- Gilbes, F.** (1989) Estudio Preliminar Sobre el Análisis del Patrón de Distribución de *Favia fragum* en el Cayo San Cristobal en La Parguera, Puerto Rico. Oral presentation, XVI Symposium of Department of Natural Resources, San Juan, PR
- Gilbes, F.** (1989) Abundancia y Distribución de los Erizos De Mar (Clase Echinoidea) en la Costa Rocosa de la Isla Caja De Muertos. Oral presentation, IX Symposium of Wildlife of Puerto Rico. University of the Sacred Heart, San Juan, PR

## **SPONSORED RESEARCH**

- Bio-Optical Properties and Remote Sensing of Coastal Waters (2002-2011) Cooperative Remote Sensing Science and Technology Center (CREST). NOAA
- Detection of Submerge Features Using Hyperspectral Remote Sensing (2000-2010) Engineering Research Center for Subsurface Sensing and Imaging Systems (CenSSIS). NSF
- Developing A Protocol To Use Remote Sensing As A Cost Effective Tool To Monitor Contamination Of Mangrove Wetlands (2006-2009) Puerto Rico Sea Grant College Program
- Monitoring Nutrients Content In The San Juan Bay Estuary Using Hyperspectral Remote Sensing (2005-2008) Puerto Rico Water Resources and Environmental Research Institute.
- Contaminant and Erosion Control Baseline Database for the Puerto Mosquito Watershed, Vieques, PR. (2003-2007) Puerto Rico Sea Grant.
- Characteristics of Mesoscales Caribbean Eddies (2003-2007) U.S. Office of Naval Research.
- Monitoring the Water Quality Parameters of Mayagüez Bay. (2001-2004) EPA Grant through the Puerto Rico Water Resources and Environmental Research Institute.
- Remote Sensing of the Eastern Caribbean Sea (1995-2005) Tropical Center for Earth and Space Studies (TCESS). NASA
- Development and Validation of Bio-Optical Algorithms in Coastal Waters. (1999-2002) NASA
- Analysis of the Inherent and Apparent Optical Properties in Case 1 and Case 2 Waters of the Caribbean. (1998-2001) NASA

## **ORGANIZATIONS AND COMMITTEES**

- Coordinator of Outcomes Assessment. UPRM-Geology. (2002-Present)
- Member of American Geophysical Union (1996-Present)
- Member of the Society of Latin American Remote Sensing Specialists (1996-2000)
- Member of Cousteau Society (1989-1992)
- Member of The Oceanography Society (1988-1991)
- Chairman of Bios'87, Department of Biology, November 2-13, 1987
- Chairman of the Biological Student Society UPR - Mayagüez Campus, 1986-1987
- Founding Member of the Scientific Research Auxiliaries Corps, DNR, 1986-1988

## **SPECIAL SKILLS**

- Bilingual: Spanish and English
- Digital image processing: SeaDAS, ERDAS-Imagine, DSP, IDL, ENVI, and TeraScan
- Computer systems: Mac OS, Windows, Unix, Linux
- Oceanographic, Bio-optical, and Remote Sensing Techniques
- Advanced Scuba Diving (NAUI Certified)
- Development of Web Pages using Adobe Web Premium CS4