

Sarah Frias-Torres, Ph.D.

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RESEARCH AND TEACHING INTERESTS

Marine conservation biology and behavioral ecology of threatened/endangered species (large grouper fish, whale sharks, seahorses and pipefishes); Effects of human-induced global climate change in tropical marine ecosystems: coral reefs, mangroves, seagrass, tropical lagoons; Human-environment interactions: tourism, resource exploitation, impact studies, coral reef crime scene investigation; Development of new technologies for ocean and marine life observing systems.

ACADEMIC DEGREES

May 2002: Ph.D. in Biological Oceanography. Florida Institute of Technology, Melbourne, FL, USA.

February 1994: M.Sc. in Marine Environmental Protection: Environmental Impact Assessment and Marine Conservation. University College of North Wales, UK.

June 1992: B.Sc. in Marine Biology. University of Barcelona, Faculty of Biology, Barcelona, Spain.

CONTINUING EDUCATION (NON-DEGREE)

2005-2007: M. A. Film Studies. School of Communication, University of Miami, FL, USA: Documentary production (Grace Barnes), Cinematography (Ed Talavera), Topics in film editing, Film scriptwriting.

INTERNATIONAL HONORS AND AWARDS

2003-2005: U.S. National Academies, National Research Council Postdoctoral Fellowship

1999: NASA Space Life Sciences Training Program – Award on mentoring excellence

1996-2002: Fulbright fellowship (USA-Spain) for doctoral studies in the USA

1993-1994: British Council - La Caixa Foundation Fellowship for graduate studies in the UK

EXPERIENCE ON CORAL REEFS AND ASSOCIATED HABITATS AND HUMAN-ENVIRONMENT INTERACTIONS

A. Recent funded projects by NOAA Coral Reef Conservation Program and fiscal year (FY)

1) \$50,000/y, in FY07-FY08: Grouper Conservation in Puerto Rico and the U.S. Virgin Islands (co-PI)

2) \$50,000/y, FY06,-FY07: Reef fish use of coral and mangrove habitats at night and/or under turbid conditions: Application of dual-frequency sonar (co-PI)

3) \$35,000 in FY06: Workshop- Conservation, Sustainable Use and Global Warming Effects on Coral Reefs and Associated Habitats in the Mayan Riviera, Mexico (PI)

4) \$70,000 / y in FY04-FY05 (PI) and FY06 (co-PI): Hydroacoustic Assessment of reef fish spawning aggregations in Puerto Rico and US.Virgin Islands.

B. Fieldwork: Field research conducted in Florida (estuaries, rivers, mangroves, coral reefs) and coral reefs in the Caribbean Sea (Bahamas, Mexico, Belize, Virgin Islands, Dominican Republic) since 1996. Free diving / snorkeling and SCUBA diving: Habitat studies, coral and fish identification, fish behavior, fish spawning aggregations, marine protected areas. Plankton and oceanographic data sampling on board ships: R/V Delphinus (Florida Institute of Technology) and R/V Edwin Link (Harbor Branch Oceanographic Institution); Water quality data (handheld and moored buoy sensors).

C. Publications: See in Publication list marked with an asterisk (*)

SYNERGISTIC ACTIVITIES

2008 Candidate to the IUCN (World Conservation Union) Grouper and Wrasse Specialist Group

2008 Guest International Observer, Coral Reef Crime Scene Investigation training, funded by the International Coral Reef Initiative (ICRI) at Punta Cana, Dominican Republic, April 2008.

2007 Guest speaker Goliath grouper Research Planning Meeting, FL Fish & Wildlife Research Inst.

2007 Guest speaker at the Theme Workshop: “The Status of Goliath Grouper: Finding a Common Conservation and Management Solution through a Regional Scientific and Fisheries Framework” at the Gulf and Caribbean Fisheries Institute Conference, November 2007.

PENDING SUPPORT**Agency: National Science Foundation, Small Grants for Exploratory Research (SGRE)**

FY09: Spot-pattern fingerprint identification: An automated image identification tool for the monitoring and conservation of large grouper fish. PI: Ribeiro; co-PI: Frias-Torres, Hoier, Shenker. \$200,000. In preparation

Agency: Private foundations and NOAA Coral Reef Conservation Program

FY09: Training workshop in the Spanish-speaking Caribbean on coral bleaching, coral diseases and effects of global climate change on coral ecosystems. Collaborators: NOAA's Coral Disease and Health Consortium (B. Vargas), NGO Latin-American Institute of Sciences and the Environment (M. Bello). \$70,000. In preparation

Agency: National Geographic and PADI foundation

FY09: Diving with goliath: assessing ecotourism impact on a threatened grouper fish

Collaborators: Florida Institute of Technology, Ocean Research and Conservation Association. \$50,000 (combined request). Submitted

COLLABORATORS AND PROFESSIONAL AFFILIATIONS

Serafy, Kellison, Bohnsack (NOAA-SEFSC), Vargas (NOAA-CDHC), Gulko (ICRI), Widder (ORCA), Hueter & Vaughan (Mote Marine Lab), Acosta (FWRI), Koenig & Coleman (UF) and scientists from Puerto Rico & USVI, Dominican Republic, Mexico, Costa Rica, Colombia, Venezuela, Curacao. **Affiliations:** American Society of Limnology and Oceanography (ASLO), Society for Conservation Biology (SCB), Society for the Conservation of Reef Fish Aggregations (SCRFA), Association of Marine Laboratories of the Caribbean (AMLC); Gulf and Caribbean Fisheries Institute (GCFI).

TECHNIQUES / SKILLS USED

LANGUAGES: Proficiency in English, Spanish, Portuguese and Catalan. Basic French and Italian.

UNDERWATER TECHNIQUES: scientific SCUBA diving since 1992; snorkeling and free diving, underwater visual census, animal behavior and other standard underwater experimental protocols.

AQUARIA: Standard and flow-through aquaria, live foods, fish and invertebrates

STATE OF THE ART TECHNIQUES: Coral reef crime scene investigation; Dual-frequency identification sonar (DIDSON); Visible implant elastomer tags; Telemetry (VEMCO) internal tags and listening stations.

GEOGRAPHIC INFORMATION SYSTEMS: ArcView 3.x, ArcGIS 8 and 9 and GIS Marine Data Model;

REMOTE SENSING: Satellite Oceanography image analysis.

COMPUTER ANALYSIS: Microsoft Office (Word, Excel, Power Point, Access); EndNote; Statistical Analysis (Statistica, Sigma Stat); Data analysis for animal movement and underwater surveys.

DOCUMENTARY AND WILDLIFE FILMS: Digital photo and video cameras, underwater photography and video, digital editing (Final Cut Pro, Studio 9), documentary scriptwriting and production.

PRESENT AND PAST POSITIONS

April 2008-Present: Adjunct Research Faculty, Ocean Research and Conservation Association (ORCA), Fort Pierce, FL, USA

April 2007 – Present: Marine Scientist. MRAG Americas, St. Petersburg, FL, USA .Environmental consulting on marine conservation and Environmental Impact Study in the Americas:

May 2005 – Present: Adjunct Research Faculty, Florida Institute of Technology, Melbourne, FL, USA.

May 2005- April 2007: Assistant Scientist. Rosenstiel School of Marine and Atmospheric Sciences (RSMAS), University of Miami and NOAA Southeast Fisheries Science Center, Miami, FL USA. Research on large grouper fish species, conservation and management; coastal law of Florida and the U.S.A.; GIS-based tools for resource managements, Florida and Caribbean ecosystems; Consultant of the U.S. Endangered Species list; PI and co-PI for several projects of the NOAA Coral Reef Conservation Program (see “funded research” section above). Mentoring of graduate and undergraduate students. Supervisors: Drs. Joe Serafy and Todd Kellison.

April 2003- May 2005: U.S. National Academy of Sciences Postdoctoral Associate. (U.S. National Research Council Postdoctoral Fellowship). At NOAA Southeast Fisheries Science Center, Miami, FL USA. Research on the life history of groupers, spawning aggregations, marine protected areas, Florida and Caribbean ecosystems. Consultant for the Candidate Species and Species of Concern Section of the U.S. Endangered Species list. Mentoring of graduate and undergraduate students. Supervisor: Dr. Anne-Marie Eklund.

June 2002 - April 2003: Postdoctoral Associate. Louisiana Universities Marine Consortium,

Chauvin, LA, USA. Implemented a Geographic Information System (GIS)-ArcView platform for several 30-year fisheries-independent datasets on fish population changes in the Gulf of Mexico.

Supervisor: Dr. Ed Chesney

August 1997 - May 2002: Research and Teaching Assistant. Florida Institute of Technology, USA. (Fall and Spring semesters only). Taught graduate and undergraduate courses and field work in Oceanography and Marine Biology and Earth System Science. Supervisor: Dr. George A. Maul

May 1999 - September 2000: Research Scientist. Dynamac Corporation. NASA, Kennedy Space Center, FL, USA. Implemented a remote sensing program on oceanographic satellite images. Mentoring of undergraduate students. Supervisor: Dr. R. Grant Gilmore Jr.

Internships: 1) May - August 2001. Smithsonian Marine Station at Fort Pierce, Smithsonian Institution, FL, USA. Developed a transport model of the Gulf Stream based on satellite images and buoy data. Contributed to setup a marine ecosystems exhibit. Supervisor: Dr. Mary Rice. 2) **May - August 1998.** Harbor Branch Oceanographic Institution, FL, USA. Analyzed five years of ichthyoplankton data from the Gulf of Mexico (SEAMAP) and completed educational exhibit. Supervisor: Dr. R. Grant Gilmore Jr.

PUBLICATIONS AND PRESENTATIONS

Asterisk (*) indicates publications related to the ecology of coral reefs and associated habitats, and interactions between humans and the environment.

PEER-REVIEWED PUBLICATIONS

***Frias-Torres S.** A migratory fish in Florida's canal system. *Conservation Biology*; *IN PREPARATION*

***Frias-Torres S.** Risky behavior in an extinction-prone reef fish. *Conservation Biology*. *IN-REVIEW*

***Frias-Torres S,** Luo J, Serafy JE . 2008. Using dual-frequency sonar to detect juvenile goliath grouper, *Epinephelus itajara*, in mangrove habitats. *Endangered Species Research*. *IN PRESS*.

Murie DJ, Parkyn DC, Koenig CC, Coleman FC, Schull J, **Frias-Torres S.** 2008. Evaluation of finrays as a non-lethal ageing method for protected goliath grouper *Epinephelus itajara* in Florida. *Endangered Species Research*. *IN PRESS*.

***Frias-Torres S,** Barroso P, Eklund A-M, Schull J, Serafy J. 2007. Activity patterns of juvenile goliath grouper, *Epinephelus itajara*, in a mangrove nursery. *Bulletin of Marine Science* 80: 587-594.

***Frias-Torres S.** 2006. Habitat use by juvenile goliath grouper, *Epinephelus itajara*, in the Florida Keys, USA. *Endangered Species Research* 2: 1-6

Frias-Torres S. 2005. Large pelagic fish distribution in the tropical western Atlantic relevant to conservation. *Proceedings of the Gulf and Caribbean Fisheries Institute*, 56: 253-257.

Frias-Torres S. 2005. Melamphaidae: Big scale fishes or ridgeheads, Vol 1, Chapter 96, Pp. 1067-1074. In: W.J. Richards (ed.). *Early Stages of Atlantic Fishes: An Identification Guide for the Western Central North Atlantic*. CRC Press, Taylor & Francis Group, Boca Raton, Florida, 1335 p.

Frias-Torres S. 2005. Syngnathidae: Seahorses and pipefishes, Vol. 1, Chapter 107, Pp. 1133-1138. In: W.J. Richards (ed.). *Early Stages of Atlantic Fishes: An Identification Guide for the Western Central North Atlantic*. CRC Press, Taylor & Francis Group, Boca Raton, Florida, 1335 p.

***Frias-Torres S.** 2004. Whale sharks and marine protected areas in the tropical western Atlantic. *Current: the Journal of Marine Education* 20 (3): 39-40.

Frias-Torres S. 2004. Notes on aquarium brood release and feeding of the opossum pipefish, *Microphis brachyurus lineatus*. *Gulf and Caribbean Research*, 16: 73-75

NEWSPAPER ARTICLES

***Frias-Torres S.** 2007. "El 50 % de los arrecifes de coral estan al borde del colapso" (50% of coral reefs are close to collapse), *El Periodico*, Barcelona, Spain, published July 16, 2007;

***Frias-Torres S.** 2008. "El atun rojo gigante al borde de la extinción en el Mediterráneo" (Giant bluefin tuna nears extinction in the Mediterranean), *El Periodico*, Barcelona, Spain, to be published summer 2008.

OTHER PUBLICATIONS:

Gilmore RG, **Frias-Torres S.** 2000. Satellite Imagery and Ground Truth Study for the Candidate Species, Opossum Pipefish, *Microphis brachyurus lineatus*. Final Report NMFS Ref. 40GANF900096.

Frias-Torres S. 2002. Oceanic transport and life history of the tropical western Atlantic Opossum Pipefish, *Microphis brachyurus lineatus*. Ph.D. Dissertation. Florida Institute of Technology, Melbourne, FL, USA. Adviser: Dr. R. Grant Gilmore.

Frias-Torres S. 1993. Management of the Sea Urchin Fishery, *Paracentrotus lividus*, in the Catalan Coast, Western Mediterranean. M.Sc. Thesis, School of Ocean Sciences, University College of North Wales, UK.

PRESENTATIONS:

Frias-Torres S., Bello M, Araujo R, Cardenas H. **2008.** Challenges in coral reef management: Lessons learnt from education and outreach projects in the Mexican Caribbean. International Coral Reef Symposium, Fort Lauderdale, Florida, July 2008 (Abstract accepted; Frias-Torres speaker)

Frias-Torres, S. 2007. Behavior of juvenile goliath grouper, *Epinephelus itajara*, relevant to conservation. 33rd Scientific Conference of the Association of Marine Laboratories of the Caribbean. St. Thomas, U.S. Virgin Islands, June 2007.

Frias-Torres S, Luo J, Serafy JE. **2006.** Using dual-frequency sonar to detect juvenile goliath grouper, *Epinephelus itajara*, in mangrove habitats. 59th Gulf and Caribbean Fisheries Institute Conference, Belize City, Belize, November, 2006. (Frias-Torres presented)

Frias-Torres S, Barroso P. **2004.** Habitat use of juvenile goliath grouper, *Epinephelus itajara*, in the Florida Keys. 57th Gulf and Caribbean Fisheries Institute Conference, St. Petersburg, Florida, USA, November, 2004. (Frias-Torres presented)

Frias-Torres S. 2003. Large pelagic fish distribution in the tropical western Atlantic relevant to conservation. 56th Gulf and Caribbean Fisheries Institute Conference, Tortola, British Virgin Islands, November 2003.

Frias-Torres S, Gilmore RG. **2001.** Cross-shelf transport of the migratory opossum pipefish, *Microphis brachyurus lineatus*. Best Poster Presentation Award. 16th Biennial Conference of the Estuarine Research Federation, St. Petersburg Beach, Florida, November 2001. (Frias-Torres presented)

EXPERIENCE IN COMMUNICATING SCIENCE TO GENERAL AUDIENCES

CONSERVATION DOCUMENTARIES.- Direction, filming, editing and production of independent conservation documentary “Mangroves”, (10 mins, expert interviews from the First International Symposium on Mangroves as Fish Habitat, University of Miami, April 19- 21, 2006)

PITCHING STORIES TO THE MEDIA. - A) STORY: “Stingrays are NOT mindless killers” Interview in Spanish on Telemundo 51-Miami on Maria Montoya’s Enfoque Comunitario aired Fall 2006 **B) STORY:** “El mero goliath” pitched to Clemente Atila, Telemundo 51-Miami July 2007, filming ongoing, to be aired late 2008; **C) STORY:** “The goliath grouper story “ Pitched to Jeff Burnside from NBC6 News-Miami. Filming with interview to Jean Michel Cousteau, July 25, 2007 and with underwater video, to be aired on primetime news late 2008.

TALKING TO GENERAL AUDIENCES IN INFORMAL SETTING.-

January 2005-Present. Rescue and rehabilitation of stranded dolphins. Collaborated in life support, rehabilitation and behavioral observations of rescued dolphins; Outreach activities on marine mammal conservation. Marine Animal Rescue Society of Miami, FL, USA

- **June 2004 and 2006:** Workshop on sustainable tourism and coral reef conservation in the Mayan Riviera, Mexican Caribbean. Organized by the NGO Instituto Latinoamericano de Ciencias Marinas y del Ambiente (Latin American Institute of Marine and Environmental Sciences), Playa del Carmen (2004, private funding) and Cancun (2006, funded by NOAA Coral Reef Conservation Program), Quintana Roo, Mexico.

- **Winter 2003 – 2006:** Invited Speaker at three Miami (Florida) institutions to 1) promote scientific careers among minority students (Miami Science Museum); 2) teach marine conservation to children under 15 and their parents (Marjory Stoneman Douglas Biscayne Nature Center); 3) marine conservation outreach to seniors in the Miami community (Osher Lifelong Learning Center, University of Miami).

- **Summer 1999:** The Space Life Sciences Training Program, a hands-on research NASA-funded program; Kennedy Space Center, FL, USA. Mentored three undergraduate minority students and developed individual research projects for them. NASA Award on mentoring excellence.

- **Summer 1997:** Indian River Lagoon Bottlenose Dolphin Population Survey. Florida Institute of Technology, FL, USA. Boat-based photo-identification to determine ecology and behavior of bottlenose dolphin in the Indian River Lagoon; Outreach on conservation of marine mammals in east central Florida.