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of Divers Committed
to the Preservation of the
Marine Environment**

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Online Data Entry Has Arrived!

The long wait is finally over. In January 2005, a new era in the Fish Survey Project began when we launched the online data entry program for surveys conducted in the Tropical Western Atlantic region (Caribbean, Florida, Bahamas, Gulf of Mexico). With over 2,000 survey forms received at REEF Headquarters each month, this new service will both improve the efficiency and reduce rising costs of processing data. In developing this program, REEF worked with the online division of Pearson National Computing Services, the company that produces our paper scanforms, as well as Michael Coyne, our volunteer database specialist, to ensure that data entered online would mesh seamlessly with our existing data management system. The National Marine Sanctuary Program and the Mahoney Foundation provided funding for the programming, and after months of planning, testing and tweaking, we have developed an easy-to-use Internet tool.

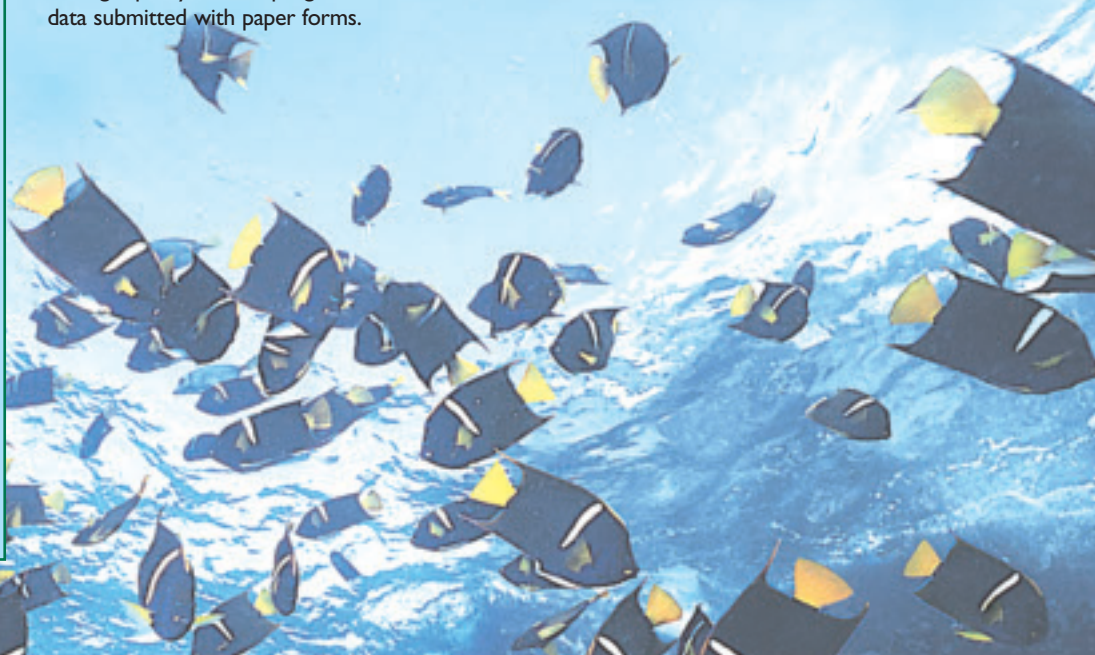
The interface allows volunteers to log on and complete data entry, either during one or multiple sessions (e.g. if a surveyor must logoff before submission is complete or if the Internet connection is lost, the incomplete survey record will be available for completion when they log back in). The program eliminates many of the common clerical errors made on forms (missing information, incorrect geographic codes, etc.) and it also notes potential species errors based on existing REEF data. Data entered online is not immediately input into the REEF database, but instead is first reviewed by REEF staff and run through quality control programs, the same as data submitted with paper forms.



REEF surveyors can now enter their sightings data online. Photo by Paul Humann.

What's next? REEF is currently working to secure funds to adapt the TWA program for our other regions and we hope to have these completed by the end of 2005. We are also looking for funding to create a companion software program to enable data to be entered while offline that can then be uploaded and submitted during a later Internet session. This will be very useful for members who do not have consistent Internet access and also for entering data on a laptop while on a dive trip. Of course, REEF will continue to provide and process paper scanforms, but we look forward to this next phase in the evolution of the Fish Survey Project.

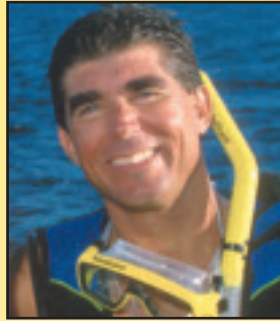
To access the online data entry program, visit <http://www.reef.org/dataentry>.



Director's Corner

Hello REEFers!

Same direction — new roads! This year and beyond is promising to be a very productive and exciting time for REEF. We are continuing to develop and support our long-term programs while expanding into new areas and checking off some long-time project goals.



First, I hope you have all had a chance to visit the new on-line data entry at REEF.org. This is a project we have been working on for the last two years that has finally come to fruition. Much thanks to the Mahoney Foundation and the National Marine Sanctuary System for their support and encouragement in getting the on-line entry up and running. Kudos and thanks too, to Dr. Micheal Coyne for his work and assistance in the project. We are excited to offer this option to our members and are already seeing the conservation (less paper) and monetary (less printing and postage) savings.

Another long-term goal that has been moving forward has been the expansion of the Fish Survey Project to the Tropical South Pacific region. We weren't sure how this would work with so many species, but after three visits to the region, we are confident in the program's success and are moving forward. The expansion will focus on the National Marine Sanctuary and National Park in American Samoa and will be applicable to other islands in the oceanic Pacific region. Look for the debut of the program in the beginning of 2006.

Our partnership with the National Marine Sanctuaries continues to flourish, with surveys and assessments taking place this year in 7 of the 13 marine sanctuaries. In addition, we are beginning to cultivate a relationship with the National Park System and are undertaking our first survey work with the parks this spring. We look forward to fruitful and lasting relationships and are very excited to be able to work with those in charge of managing our Nation's marine resources.

Outside the U.S., our foreign partnerships are flourishing as well. Recent work on the grouper aggregation in the Cayman Islands, training and assessments with the marine parks in Mexico and upcoming training workshops in Utila, Costa Rica and Mexico, are all aimed at increasing the public-private partnerships embodied in the REEF program.

New work is also being undertaken on the education and outreach front with the formation of an Educators Advisory Committee and plans to develop classroom-based curricular materials and home-study REEF certification programs. We are very excited to be able to move in this direction after many years of discussion and planning. Also, keep your eyes open for new e-newsletters, and be sure to let us know how you like them. As always we look to stretch our dollars and e-communication is an easy way to reach our members.

Finally, don't forget about upcoming events to get you in the water. We have a full schedule of exciting Field Surveys on tap for this year as well as a number of events like Earth day in April, the Great Annual Fish Count this July, and Paul Humann's Discovery tour in Key Largo, also in July.

Best Fishes and see you in the water!




Lad Akins
Executive Director, REEF

Two Exciting Products Available From REEF's Online Store

Sensational Seas DVD

Sensational Seas is a 'must-sea' DVD for any underwater enthusiast! Twenty-five divers donated some of their most rare and extraordinary video to benefit REEF. Contributors ranged from talented amateurs to Howard and Michele Hall of IMAX and PBS fame. We assure you it's not DRY viewing, quite the opposite, this DVD will make you want to don your scuba gear and hop in the water right away.



The production was headed up by Anna DeLoach, after capturing many spectacular underwater sights during her diving adventures. The show gets off to a rocking start when Scuba Zoo Images (Borneo) shows off some spontaneous underwater fun accompanied to Elvis's "A Little Less Conversation." Narrators Stan Waterman and Cat Holloway escort you through an undersea video anthology ranging from majestic whale sharks and humpback whales to the poignant mating courtship of squid. There is a tender courtship dance between dolphins in the Caribbean and a no-holds-barred turf war between three-inch blennies in the Sea of Cortez and much more. Each video clip is just a few minutes long, leaving the viewer tantalized by many species and locales in a little over an hour. And remember, all proceeds from this wonderful anthology go towards REEF and helping us accomplish our mission.

ReefNet "Fishes of the Caribbean"

If you're looking for a great digital reference for fishes of the tropical western Atlantic, then you should consider ReefNet's Fishes of the Caribbean (enhanced 3rd edition) available in both CD and DVD formats. ReefNet provides the most comprehensive scientific electronic reference guide for Caribbean fishes. Detailed descriptions, thousands of images



and video clips, and a variety of interactive tools make this a truly unique product. The video component to Fishes of the Caribbean provides a valuable learning tool for underwater identification, seeing the fishes swim from several viewpoints creates a more realistic diving scenario. In addition, this software allows you to create personalized slide shows.

Get your copies of these great resources today through REEF's online store, <http://www.reef.org/cgi-bin/shop.cgi>.

Interested in hearing from us more often? Sign up for our free monthly e-newsletter, REEF-in-Brief. Visit <http://www.reef.org/enews> to find out more.

Field Surveys

Reef Environmental Education Foundation (REEF) trips are your opportunity to take a vacation that counts! These week-long diving adventures are not only lots of fun, but they are educational and environmentally important. And there is no better way to improve your fish identification skills. An additional \$200 REEF fee will be added to each trip to cover the cost of the group leader, seminars, and survey materials (*Fee is less on short trips). Prices do not include airfare. Please call Dive Reservations, Inc. at 888-363-3345 or email reef@diveres.com to find out more about a specific trip or to reserve a spot. Sign up early, trips fill up fast! Visit <http://www.reef.org/fieldsurv>

2005 Trip Schedule

St. Croix, USVI • Ultimate Blue Water Adventures and Hotel Caravelle • April 23-30 2005

\$1008, includes 5 days of 2-tank dives and 1 day of 3-tank dives and harbor-view accommodations

Monterey Bay National Marine Sanctuary • Cypress Charters • May 10-15, 2005

\$245, includes 2 days of 2-tank diving and 1 day of 3-tank diving, an organized day of shore diving at Pt. Lobos Marine Reserve, and a behind-the-scenes tour of the Monterey Bay Aquarium

Sosua, Dominican Republic • Northern Coast Diving Center and Sosua By the Sea Hotel • June 11-18, 2005

\$755, includes 5 days of 2-tank plus 1 day of 1-tank dives, lodging at Sosua By the Sea, and r/t airport transfers

West Palm Beach, Florida • Jim Abernethy's Scuba Adventures and Singer Island Hilton • July 7-11, 2005

\$681, includes 3 days of 2-tank dives and accommodations

Utila, Honduras • Deep Blue Divers • July 16-23, 2005

\$1160, includes ocean view accommodations with private balcony, all meals, unlimited shore diving, 3 boat dives per day and airport transfers



Yummy! Doug Harder and Sandra Percell enjoy a roti in between dives on the Bequia 2004 trip. Photo © REEF.



Participants on REEF's Field Survey to Lee Stocking Island in the Bahamas in 2004. Photo © REEF.

Key Largo, Florida • REEF Discovery Tour led by Paul Humann • July 16-23, 2005 • Horizon Divers

\$1025 (Ramada Inn Key Largo) or \$1,135 (Best Western Suites Key Largo), includes accommodations and 5 days of 2-tank AM dives and 3 1-tank dusk dives

This week is for divers and snorkelers who are interested in learning more about marine life and seeing more in the water. Paul Humann will lead this trip and will teach reef fish and creature identification and behavior.

Kona, Hawaii • Jack's Diving Locker and Royal Kona Resort • August 6-13, 2005

\$1107, includes lodging, 5 days of 2-tank boat dives, and lunch on dive days

Bonaire • Captain Don's Habitat • September 3-10, 2005

\$850, includes accommodations in a Deluxe Junior Suite, 5 days 1 tank boat dives and unlimited shore dives

Sea of Cortez, Mexico • Don Jose • October 2-9, 2005

\$1567, this trip will feature a custom itinerary of locations in the southwestern Gulf, includes lodging, food and unlimited diving aboard an 80-ft long live-aboard, hotel lodging the last night in La Paz and airport transfer

Grand Cayman East End • Ocean Frontiers and Compass Point • November 5-12, 2005

\$851, includes luxury condominium accommodation and 5 days of 2 tank boat dives

Cozumel • Aqua Safari and Safari Inn • December 3-10, 2005

\$430, includes accommodations and 5 days of 2-tank AM dives

What People Say About REEF Field Surveys:

"REEF survey trips are the perfect way for me to take a dive vacation with a great group of people, go places I might not go on my own, improve my fish ID skills, and do something good for the planet."

— B. Brown, Golden Valley, MN

"It is reassuring to go on a trip alone and know that I will be in the company of fun people with like interests, and often with friends from prior trips."

— J. Eyre, San Francisco, CA



REEF members of all ages enjoy themselves on Field Surveys. Mike Semmens, with granddaughter Gracie, show off their matching shirts. Photo © REEF.



Special Projects

Studying the Wanderings of Grouper:

Grouper Moon 2005

What started in 2001 as alarmed discussions during a REEF Field Survey to Little Cayman Island about the large number of Nassau grouper that had been removed by fisherman from a newly discovered spawning aggregation site earlier that year has evolved into a successful research and conservation effort. The Grouper Moon Project is a collaboration between REEF and the Cayman Islands Department of the Environment (CIDOE) to monitor and study the aggregation. In 2002, REEF coordinated a groundbreaking expedition to the Cayman Islands to observe the aggregation and to develop a protocol for monitoring the aggregation.

During that first year, over 5,000 fish were present at the site. The characteristics of the aggregation were documented and the results were published in the scientific journal *Environmental Biology of Fishes*. Unfortunately, that same year, the aggregation was again harvested at very high levels and over 2,000 Nassau grouper were taken during a two-week period. However, results from the project enabled the CIDOE to work with the Cayman Islands Marine Conservation Board to prohibit all harvest from spawning aggregation sites for at least 8-years. Our first success!

The Grouper Moon Project continued in 2003 and 2004, empowered by the first year's success and the passion of project leader Leslie Whaylen. A team of divers visually and photographically monitored the aggregation each year and began to develop an understanding of how the aggregation works. A team of REEF volunteers also began documenting the behavior of migrating grouper seen on the reefs during the aggregation period.

In 2005, a new component was added to begin to address many of the unknowns about fish that visit the aggregation, such as "do fish attend the aggregation every year", "where do the aggregating fish come from,



External Floy tags were used to enable researchers to visually identify acoustically tagged fish underwater. A total of 50 Nassau grouper have been acoustically tagged on Little Cayman island as part of the Grouper Moon Project in an effort to better understand the movement patterns of aggregating grouper. Photo by Scott Heppell.



Normally solitary and territorial, during the winter full moons Nassau grouper travel, sometimes over great distances, and "group" together to spawn. About fifty of these spawning aggregations sites have been recorded in different places throughout the Caribbean. Due to the timing and site fidelity of the aggregations and the ease with which these normally solitary fish can be caught while aggregating, one-third to one-half of the known Caribbean aggregation sites are now inactive. The Cayman Islands used to be home to five spawning sites. Today, the west end Little Cayman site is the only one still functioning, the others were fished to extinction. Photo by Phil Bush.

i.e. where is their home reef", "what is the sex ratio of the aggregation", and "what do the fish do during the aggregation cycle", and more broadly to provide evidence (or lack thereof) that the harvest restrictions are warranted and merit extension beyond the 8-year sunset clause. Thanks to a grant from the NOAA International Coral Reef Conservation Program, REEF, under the direction of researcher Brice Semmens, initiated a multi-year acoustic tagging project on the Little Cayman aggregation.

The acoustic project involves the installation of 18 hydrophones around Little Cayman Island and acoustically tagging 50 Nassau grouper (30 during the aggregation and 20 this Spring from inshore reefs). The acoustic tags, which are surgically implanted in the belly of the fish, emit a signal that is picked up by a hydrophone if the fish passes within 400 meters. The hydrophones will record the presence of the tagged grouper for up to 3 years (before the tag battery wears out). Acoustically tagged fish are also tagged with an external Floy tag (often called spaghetti tags) so that they can be visually identified underwater. Blood and tissue samples are collected during the tagging process in order to look at hormone levels and genetics. Project collaborator and fish physiologist, Dr. Scott Heppell from Oregon State University, is coordinating the hormone assays.

The hydrophone installation and tagging of aggregating fish were conducted during the January 2005 Grouper Moon expedition, and

everything went smoothly. The ongoing aggregation characterization and grouper migration studies also continued. Another successful year!

REEF would like to extend our appreciation to the entire CIDOE team (Phil Bush, Bradley Johnson, Kirsten Luke, and Croy McCoy), to project team members (Judie Clee, Scott Heppell, Brenda Hitt, Brice Semmens and Leslie Whaylen), and to Peter Hillebrand for their ongoing support and dedication to this project. The Southern Cross Club, McCoy's Fishing and Diving Lodge, Pirate's Point Resort and the Little Cayman Beach Resort provided generous logistical support. Funding was provided by the NOAA International Coral Reef Conservation Program and the PADI Project AWARE Foundation. We also thank Raymarine Marine Electronics for their donation of a RADAR system to support CIDOE's enforcement efforts on the Little Cayman spawning aggregation.

To learn more about the Grouper Moon Project and to see videos and images collected during the project, visit <http://www.reef.org/data/groupermoon>.

If you are interested in supporting the Project, please contact Lad Akins (lad@reef.org, 305-852-0030). While we've done well at securing funding for equipment, our operational expenses for the Grouper Moon project are chronically under funded. We continue to rely on the kindness of Little Cayman's citizens and businesses for in-kind support such as lodging and scuba supplies. However, we need funds for mundane (yet crucial) expenses like air travel and ramen noodles, as well as expanding the scope of the tagging project to the other Cayman Islands. Rest assured that any donations would continue to be stretched to the absolute limit of usefulness.

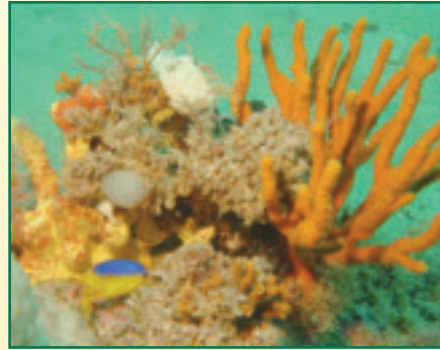
Fish Size and Biodiversity Assessments at Gray's Reef

In the Fall 2004, REEF took a major step in our continuing effort to provide data that are useful for marine management through a partnership with Gray's Reef National Marine Sanctuary (GRNMS) off the coast of Georgia. A team of eight REEF experts undertook a 9-day project to document fish species AND FISH SIZES at sites off the Georgia coast. This is the first time REEF has incorporated a size component into monitoring efforts.

The move was predicated on the need of GRNMS staff for data on fish size at different sites within and outside of Sanctuary waters. Much attention has gone into the effect of fishing at some of these sites and the potential closure of some sites for study. However, the only information on size of fish in the area has come from limited creel studies and only for species targeted by fishers.

Working with GRNMS Research Coordinator Greg McFall and NOAA liaison Jim Bohnsack, REEF developed a protocol for collecting size data on 34 species of fish found at Gray's Reef. The project included a day of size-estimation training and fine-tuning observer estimations, followed by 8 full days in the water at 9 sites. We are currently summarizing and analyzing the data, but initial impressions are that the method will be very valuable in determining status and changes in the fish assemblages and size structure.

Future work is planned for this June and will focus on refining the methodology and collecting more baseline data for comparison to post-closure data to document the closure's effectiveness. For more information visit <http://www.reef.org/sanctuaries/GRNMS.html> or visit <http://www.graysreef.nos.noaa.gov>.



The bottom habitat of GRNMS is alive with color. This type of habitat, rich in sponges and soft coral, is known as live bottom. Image courtesy Gray's Reef NMS/Greg McFall.

A juvenile Cocoa Damselfish takes refuge in a small patch reef at GRNMS. Image courtesy Gray's Reef NMS/Greg McFall.



Biscayne National Park Species Inventory Project

Ever wonder just how many species and what kinds of fish are in a certain area? Well, managers at our National Parks wonder as well. To more effectively manage their resources, the Park Service has developed a plan to inventory their lands and waters. REEF is proud to be part of one of the first minimal impact inventory projects in our marine National Parks.

This Spring, a team of REEF experts will begin a two year effort to sample different habitats throughout Biscayne National Park (BNP) in an effort to compile a detailed inventory of fishes. Working for five days biannually, a team of six divers will conduct more than 280 surveys at over 144 sites in this park off the southeastern coast of Florida to determine who lives there. The team will conduct fish surveys in eight different habitat types, including seagrasses, sand and rubble, mangrove channels, wrecks, and four different types of reefs. Voucher specimens and photographs of those species previously undocumented in the BNP will be collected and included in a museum collection.

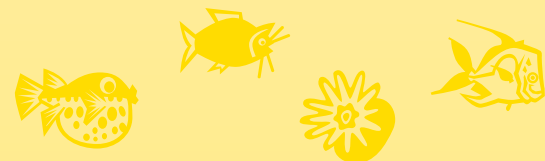
For REEF volunteers, this project is a dream come true; getting to dive in all of the different habitat types to find as many different species as possible. The National Park Service will use the data as an inventory to direct future use management actions.

In addition to the data collection, volunteers will also be interacting with visitors to the South Florida area as part of the Everglades Hostel partnership. Team members will stay at the Hostel and conduct informal evening briefings on their day's work as well as formal presentations to other hostlers on South Florida fishes. The Hostel Partnership is an ongoing effort to include visitors in conservation efforts through non-traditional interactions and learning programs. Besides the inventory project in Biscayne the partnership will also include many alternative programs directed at youth.

For more information on BNP visit <http://www.nps.gov/bisc> or the Everglades Hostel visit <http://www.evergladeshostel.com>.



A diversity of fishes can be found in Biscayne National Park, the northern most reefs of the Florida Keys. REEF volunteers will be working on a species inventory project in the Park over the next few years. Photo courtesy Biscayne NP.





Fish Survey Project News

REEF's Next Geographic Region

South Pacific, here we come! That's right; REEF is slowly working its way into the western Pacific. Coincident with REEF's continued success are continual requests for the expansion of the Fish Survey Project to new regions. Broadening our reach always requires careful planning and partnership building, as well as lots of staff time and funds. And so it is with measured steps that we move toward our next geographic region.



The Regal Angelfish is one of the many beautiful fishes that inhabit the Fagatele Bay National Marine Sanctuary in American Samoa. Photo courtesy of New World Publications

As part of our strong relationship with the National Marine Sanctuary Program, REEF has been working with the Fagatele Bay National Marine Sanctuary (FBNMS) to expand our existing program to American Samoa. This tiny cluster of islands just east of Fiji is the southern most US territory and is home to rich coral reefs.

In addition to providing a mechanism to engage the local Samoan communities in the



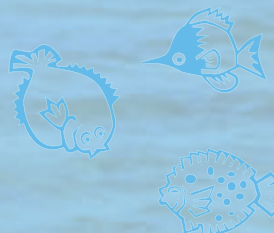
During REEF's visit to American Samoa in November 2004, we coordinated a fish identification and survey training workshop. The workshop included both classroom and field training. Workshop participants are shown here before a REEF fish survey dive at the reef in Alofau Village.

understanding of their coastal resources, the Fish Survey Project will provide valuable and much needed data. The coastal ecosystem around American Samoa is at a critical time; rebounding from multiple natural impacts, and suffering in some locations from anthropogenic stressors such as over-fishing and land-based pollution. Despite the lack of a local dive industry, there are many local divers and snorkelers, and the FBNMS as well as the community based MPAs and other village and territory management agencies have expressed a significant interest in locally coordinating REEF efforts.

With funding from the FBNMS, REEF staff and representatives conducted a visit to American Samoa in November 2004 to field test draft training and survey materials, including underwater survey paper, the scanform and an introduction to local fish identification curriculum. In addition to several days of survey dives with FBNMS and the American Samoa Department of Marine and Wildlife Resources (DMWR) (coordinated with lots of help from past REEF employee Leslie Whaylen, who now



Workshop participants get ready for a REEF survey snorkel.



The most remote of the National Marine Sanctuaries, Fagatele Bay NMS (shown here) is located on the main American Samoan island of Tutuila.

works for DMWR), a two-day REEF workshop was held for 25 participants, including staff from FBNMS, DMWR, the American Samoa Community College and the Coral Reef Advisory Group. The workshop included both classroom time as well as field training with survey dives at two local Samoan villages, Vatia and Alofau. The trip was a great success. Over 60 surveys were conducted (which will be entered into the REEF database when we eventually launch the program), we were able to refine the materials based on the field-testing and key partnerships were formed.

We are currently finalizing the survey and training materials for American Samoa and plan to officially launch the REEF Fish Survey Project there by the end of 2005. We are excited about this move and see it as the first step in developing a South Pacific program, which will include Fiji, the Cook Islands and the Tuamotos.

Where is American Samoa?



This American Territory is two thirds the way from Hawaii to New Zealand.



Veracruz Discovery: REEF Volunteers Discover New Fish Species In Mexico



REEF surveyors discovered this undescribed species of goby, now called the Jarocho goby, during a project in Veracruz Marine Park in 2003. A second goby species was also discovered and is currently being described. Photo by Lad Akins.

REEF takes great pride in working with our many partners. Our relationships with Mexican marine parks have been some of our most active and successful. Beginning with the Cozumel Marine Park in 1999 and expanding our partnership to include the Veracruz Marine Park in 2003, local REEF volunteers have been generating thousands of valuable fish surveys from these regions. However, they have also been gathering more than just population and distribution information.

In July of 2003, at the invitation of Park Director, Elvira Carvajal, REEF conducted training and assessment programs for staff and volunteers of the Veracruz Marine Park, the oldest in Mexico. During the survey dives, volunteers discovered fish assemblages that were extremely unusual. Of course there were the standard sergeant majors, bicolor damsels and four-eye butterflyfish, but there were also more dramatic finds. Two new species of goby were discovered during the project and the known range of one species of wrasse was extended over 1,000 miles and into a new body of water.



Another exciting find by REEF volunteers in Veracruz was this rare wrasse, *Halichoeres socialis*, previously only known from Belize and was just described in 2003. Photo by Lad Akins.

After gathering images and conducting detailed research on the fishes, REEF staff returned to Veracruz in 2004 to conduct further training. Working with the Veracruz Marine Park and the Veracruz Aquarium, the species were collected and brought back to the US for genetic and meristic analysis.

REEF is currently working with Dr. Mike Taylor at Notre Dame University and Dr. Jim Van Tassel at Hofstra University to complete formal descriptions of the fish species. It appears that the gobies are indeed unique and are a significant addition to the knowledge of tropical western Atlantic and Gulf of Mexico fish taxonomy. In celebration of the Veracruz Marine Park and the regional uniqueness of the species, the first goby to be described will be named *Elacatinus jarocho*, or the Jarocho goby, for the colloquial name of Veracruz locals.

The Jarocho goby is a hovering goby, found intermixed with masked/glass gobies (which are a hovering species of a different genus, *Coryphopterus*). One of the most interesting finds from Dr. Taylor's genetic work is that while the Jarocho goby is a hovering species, it is more genetically related to the sponge-dwelling species yellowprow goby (*E. xanthipora*), then to the other hovering species in the *Elacatinus* genus (*E. atronotus*, which is endemic to Exuma Sound in the Bahamas). This means that hovering has evolved separately in the two hovering *Elacatinus* species.

REEF looks forward to continuing our strong relationship with the Mexican Marine Parks and to exploring more of the Western Gulf coast in 2005.



The red arrow on this map shows the location of Veracruz Marine Park, in the southwest corner of the Gulf of Mexico. Map courtesy of Iowa State University

DATE OF SURVEY	TEMPERATURE	BOTTOM TIME
DATE: 07/03/03 TIME: 08:00 DIVER: [blank] DIVE: [blank]	TEMP: [blank] DEPTH: [blank]	TIME: [blank] DEPTH: [blank]
DIVE START	VISIBILITY	AVERAGE DEPTH
START: [blank] END: [blank] DEPTH: [blank]	VIS: [blank] TEMP: [blank]	DEPTH: [blank] TEMP: [blank]
CURRENT	HABITAT	
CURRENT: [blank]	HABITAT: [blank]	
UNLISTED SPECIES	PLEASE DO NOT WRITE IN THIS AREA	
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An image of one page from a historical REEF dataform. Thanks to a grant from NOAA's CDMP, all of REEF's historical data are being archived in a digital image database.

REEF Data – Now Safer Than Ever!

Did you ever wonder where all those scanforms go after REEF staff process them and the data are uploaded to the database? For years, they were filed away at REEF HQ to archive the original datasheets. But as you can imagine, with over 2,000 scanforms received a month, we were rapidly running out of space. At the same time, there was concern that these paper documents would not stand the test of time and that storing them in Key Largo (a hurricane zone) was probably not wise. So what is the solution?

Thanks to a grant from NOAA's Climate Data Modernization Program (CDMP), awarded to us through the National Marine Sanctuary Program, REEF is in the process of having all of our historical dataforms archived in an image database. Each page of each scanform (4 pages to a form) is scanned to create a digital image. These images are then indexed and stored in a searchable database, and the original dataforms will be stored in a long-term storage facility. Not only are the forms in a more secure medium, REEF staff can easily query the database to review images of a form (searchable by form number) when questions arise rather than having to riffle through thousands of forms in a file cabinet.

We are very excited about this technological upgrade and extend a big thanks to CDMP and their contractor, Sourcecorp, for making this possible.



Fish Survey Project News

REEF Survey Effort: Hotspots of activity and need

REEF volunteers can conduct fish surveys anytime and anywhere within our project regions. This successful model of flexibility has led to wide geographic coverage and an extremely valuable long-term data set. To date, over 80,000 surveys have been submitted from thousands of sites. While data from anywhere is valuable, we are often asked by REEF surveyors, "Where do you need surveys from?" The maps below show the total number of REEF surveys in different areas. We have listed a few areas in each region with data gaps.

Special thanks goes to REEF Intern Kate Guarena for generating these maps.



Survey Numbers and REEF Store



ID Books and CD-Roms

Caribbean & North Atlantic Guides

Reef Fish Identification –

Florida, Caribbean, Bahamas -
3rd Edition - \$39.95

Paul Humann and Ned DeLoach

Caribbean Reef Creature ID -

2nd Edition - \$39.95

Paul Humann and Ned DeLoach

Caribbean Reef Coral ID -

2nd Edition - \$34.95

Paul Humann and Ned DeLoach

The Reef Set - \$125

Paul Humann and Ned DeLoach

Stokes Fishes of the Caribbean - \$12.95

F. Joseph Stokes

Reef Fish Behavior - \$39.95

Ned DeLoach

Marine Life of the North Atlantic - \$30.00

Andrew Martinez

Temperate & Tropical Pacific Guides

Coastal Fish ID (California - Alaska) - \$32.95

Paul Humann, with Howard Hall and
Neil McDaniel

Pacific Coast Inshore Fishes, 4th Ed - \$24.95

Daniel Gotshall

Rockfishes of the Northeast Pacific - \$24.95

Milton Love, Mary Yoklavich, and
Lyman Thorsteinson

Whelks to Whales: Coastal Marine Life of the Pacific Northwest - \$19.95

Rick Harbo

Shore Fishes of Hawai'i - \$19.95

John Randall

**Plus dozens of other marine life guide
books, CD-ROMs, and children's books.**

Survey Materials



Survey Forms (Scanforms) - free

The basis of the REEF monitoring program, you can get these by either calling REEF HQ, sending an email, or using the online store. Please specify which region. (Remember that you can also enter TWA data online.)

REEF Starter Kit

The basic kit for all fishwatchers. Contains REEF underwater slate, underwater survey paper, 2 REEF scanforms, and a REEF BC tag. A waterproof color ID card is also included in all regions except the tropical western Atlantic kit, which contains the waterproof Fish-in-a-Pocket.

Available for all of REEF's regions, from \$15-25.

Survey Slates & Waterproof Paper -

Two slates are available, the standard yellow slate and a larger cold water slate that is specifically designed for conducting a survey in high currents and cold water. Both are designed to work with REEF waterproof survey paper. Waterproof survey paper is available for all REEF regions. Slates \$10-15 and waterproof paper \$0.60 each.

Project AWARE Identification Courses - \$105.

Courses include curriculum, slides, CD-ROM of slides (currently available for the TWA and TEP courses), and sample starter kit. Courses are available for the following regions: Tropical Western Atlantic (also available in Spanish), Mid-Atlantic, Northeast US, Flower Garden Banks NMS, Northern Gulf of Mexico, Gulf of California, Southern California, Northern California, Pacific Northwest Fish, Pacific Northwest Invertebrates, and Hawaii.

Course without slides - \$85.

(still includes CD-ROM of slides, currently only available for TWA & TEP)

**For more details, or
to place an order, visit
REEF's online store at
www.reef.org or call
REEF HQ at 305-852-0030.**

Survey Numbers

TWA Top 25 Surveyors

Lad Akins (985)
Linda Baker (975)
Peter Leahy (902)
Judie Clee (860)
Linda Schillinger (819)
Leslie Whaylen (795)
Sheryl Shea (732)
Jean Kirkpatrick (578)
Joe Thomas (556)
Cathy Coughlin (553)
Jessica Armacost (547)
Deena Wells (542)
Bruce Purdy (537)
Christy Semmens (479)
Kris Wilk (465)
Robert Doyle (441)
Dave Grenda (432)
Monty Doyle (410)
Joyce Schulke (385)
Edwin Steiner (376)
Ken Deaver (367)
Carol Grant (360)
Kathie Comerford (359)
Linda Ridley (357)
Darlene Gehringer (355)

PAC Top 25 Surveyors

Kawika Chetron (352)
Janna Nichols (234)
Mike Delaney (233)
Rachid Ferretti (225)
Tom Dakin (211)
John Wolfe (192)
Kirby Johnson (187)
Georgia Arrow (165)
Claude Nichols (156)
Wes Nicholson (144)
Matthew Dowell (139)
Alan Dower (133)
John Williams (124)
Doug Biffard (112)
Carl Gwinn (107)
Bryan Nichols (96)
Brian Elliott (77)
Paul Weakliem (71)
Stanley Kurovski (71)
Christy Semmens (68)
Alex Khain (67)
Olga Khainova (67)
Mark Dixon (66)
Pamela Wade (64)
Brice Semmens (61)

TEP Top Surveyors

Kandie Vactor (157)
Beth Bruton (88)
Walter Briney (70)
Sandra Percell (67)
Jeff Holmes (54)
Paul Humann (49)
Brice Semmens (42)
Martin Levy (40)
Alvaro Segura (38)
Neil Ericsson (37)
Karen Florini (36)
Karen Garcia (36)
Warren Hinks III (32)
Janet Earnshaw (29)
Chris Ostrom (28)
John Wolfe (26)
Clive R. Wood (25)
Christy Semmens (25)
Kevin White (24)
Kenny Tidwell (23)
Leslie Whaylen (22)
Marlene Smith (22)
Anna DeLoach (21)
Bob Bishop (21)
Mark Kaehler (20)

HAW Top Surveyors

Robin Newbold (138)
Nanette Harter (123)
Fred Litt (117)
Michele Vaughn (108)
James Vaughn (108)
Lynn Hodgson (94)
Janet Eyre (84)
Patricia Richardson (71)
MJ Farr (71)
Neil Rhoads (66)
Chatten Hayes (64)
Donna Brown (62)
Karen E. Levy (57)
Kayla Serotte (48)
Carol Grant (44)
Douglas Harder (43)
Kandie Vactor (39)
Christy Semmens (39)
Kathy Aguilar (38)
Dave Grenda (36)
Brice Semmens (31)
Sandra Percell (28)
Skippy Hau (27)
Wayne Batzer (25)
Danene Warnock (20)



**2004 REEF Volunteer of the Year,
Jessie Armacost.**

2004 REEF VOLUNTEER OF THE YEAR: **Jessie Armacost**

REEF is very proud to award the 2004 Volunteer of the Year honor to Jessie Armacost. Jessie has been an active REEF member since 1999 and has completed over 500 surveys. Until recently, Jessie lived in Bonaire and was locally known as the REEF "ring-leader". She is an enthusiastic supporter of REEF and has done an incredible amount of work to generate a consistent stream of high-quality data from Bonaire. She coordinated periodic fish identification training classes for the Bonaire Marine Park volunteer divers, as well as through many of the local dive shops. Through the years, Jessie's training introduced hundreds of local and visiting divers to the joy of fishwatching, and she enabled 7 local divers to progress up to REEF's Expert Level. Jessie is a member of REEF's Advanced Assessment Team and she participated in, as well as helped coordinate, several of the REEF-Ocean Conservancy training workshops held throughout the Caribbean in 2001 and 2002. She also served as a REEF representative during the annual Bonaire Dive Festival as well as the Great Annual Fish Count. The REEF staff and Board of Trustees extend a big thanks to Jessie and to the many other volunteers who help REEF achieve success.



Education and Outreach

REEF's New Educators Advisory Committee

The third letter of the REEF acronym is "Education" and we take that very seriously. REEF has a great story to tell. And we don't just mean the history of the organization, but rather the story that comes from our data. Fish are great "bio-indicators;" they can tell us a lot about the marine environment that they inhabit. The data our volunteers have collected over the years can not only be used to make effective marine management decisions but can also be a highly effective tool for education. This can include both formal and informal education, in the classroom and out, to children and adults.

We are working to build an exciting education program based firmly on the work that we do. This year we are taking a big step to further this part of our mission through the formation of REEF's first-ever Educators

Advisory Committee (EAC). We have assembled an excellent group of educators from diverse backgrounds and areas of expertise. They will serve as advisors for the program, sharing their knowledge, experience and feedback. One of the first things we will be doing with our newly formed EAC is holding a committee meeting this June in Key Largo. Thanks to support from NOAA's Coral Reef Conservation Program, we will be able to stage this conference and underwrite the participants' expenses. We look forward to this event where we will discuss the role of the EAC, designate priority areas and tasks, and set goals for our education plans. Attending committee members will have the opportunity to learn fish identification, conduct surveys, and meet in person to move our exciting program forward. (See Page 1 for a list of EAC members)

The EAC will initially focus on K-12 classroom education and greater community-based outreach and education programs. In the case of the former, REEF is addressing the need of many teachers at the secondary level who, despite having to teach more and more towards standards-based education and testing, desire to utilize real-world experiential learning in the classroom. REEF has a lot to offer in this area and we will be building resources, such as ready-to-use curricula based on our datasets. These will be effective in not only teaching marine conservation and biology but also math, social science, and verbal and presentation skills. We are also looking to design educational programs outside of the classroom, targeting adults, community groups, and other constituencies. This will allow us to reach a broader audience and raise awareness about REEF and the critical work that we do for marine conservation.

The 14th Great Annual Fish Count

REEF's signature yearly event is coming this July. The 14th Great Annual Fish Count (GAFC) looks to be bigger and better than ever! Last year's GAFC continued the success of this important marine conservation and education event. Nearly 2,000 surveys were generated during the month of July 2004 and the GAFC boasted 82 individual events throughout our survey regions.

The GAFC is an event that raises awareness about marine conservation and what REEF actually does year-round: the Fish Survey Project. Every year, more and more individuals get involved with REEF after being introduced to the critical work we do through the GAFC. It is also a time where our numerous partners, such as REEF Field Stations and non-profit organizations, have

the opportunity to use this internationally recognized event to get their message out and attract new people. This year's event will be no different and we are looking to increase participation and the awareness that the event generates.

Two new challenges that we will be undertaking with this year's GAFC have us really excited. The first challenge is to more effectively utilize the event to reach out to a wider audience. Traditionally, REEF has done a great job connecting with the divers and snorkelers that form the backbone of the organization by conducting marine life surveys. However, we have a great message that can appeal to armchair explorers as well. Many of our partners work with this type of constituency, and we are working to develop a program that will reach these groups and engage them in marine conservation in ways beyond surveying. We feel strongly that everyone can benefit from the REEF message and contribute to our efforts in numerous ways.

The second challenge is called just that – "The GAFC Fundraising Challenge." As you probably know, membership for individuals in REEF is free. The concept of this fundraising challenge was introduced on a trial basis last year as a way to raise much-needed funds for the organization



while taking advantage of the attention the GAFC receives each year. It's a pretty simple idea that can be likened to a "fish-a-thon." Individuals participating in the GAFC are encouraged to go out and get friends, family, colleagues, or whomever, to sponsor their efforts. These sponsors can give a flat donation or sponsor based on a per species amount where the participant totals up the number of individual species sighted throughout their surveying efforts during the month of July. This year, we hope to inspire greater participation in this part of the GAFC and we welcome your participation!

If you are interested in learning more about the GAFC – how you can participate, find out where events will be held near you, or discover how easy it is to organize one yourself – please visit www.fishcount.org. We hope that you will get involved in the 14th Great Annual Fish Count and see what all the excitement is about!



An enthusiastic group of divers in Vancouver, BC after a Great Annual Fish Count Dive last July. Photo courtesy of Mike Delaney.

Field Stations and Affiliates



REEF's New Non-Profit/Academic Field Station Program

REEF's Field Station Program continues to grow and show the strong commitment that many dive operators, non-profit organizations, and others have to the organization and marine conservation. We are pleased to now count more than 70 current REEF Field Stations throughout our survey regions and more are signing up all the time.

One of the newest and most exciting parts of the program is the addition of a new type of Field Station designed for non-profit organizations and academic institutions. REEF recognized the importance and the uniqueness of our relationship with these types of partners as well as how these institutions often operate with limited resources. To address this, the Non-Profit/

Academic Field Station (NAFS) category debuted late last year. These groups can apply to REEF and, if accepted based on a strong track record of marine conservation and dedication to implementing REEF programs into their work, receive a sponsorship to cover their annual Field Station fee.

Our first NAFS is Mundo Arrecife, a Costa Rican non-profit organization working on marine conservation and education issues. Their efforts to introduce the REEF program to the Pacific Coast of Costa Rica impressed us greatly and we felt they were an ideal inaugural NAFS. Their sponsor is another terrific REEF supporter and a long-standing Field Station, Amy Slate's Amoray Dive Resort in Key Largo, Florida. We are also pleased to

welcome Centro Ecologico Akumal, a non-profit organization on the Yucatan Peninsula in Mexico, as our second NAFS. Their sponsor is the nearby Akumal Dive Shop, one of REEF's newest Field Stations.

If you are interested in learning more about the program, how you can support a NAFS, or our regional training program, please contact REEF's Director of Outreach and Education, Bryan Dias at bryan@reef.org or by calling (305) 852-0030 ext. 5.

As REEF members and others dedicated to supporting marine conservation, we ask that you patronize these terrific dive operators that are REEF Field Stations the next time you plan to go out diving or snorkeling.

Field Stations

USA and Canada Field Stations

California		
Oceanside - Under Water Schools of America	7607227826	www.usascuba.com
Florida		
Cocoa Beach - Cocoa Beach Scuba Odyssey	3215379751	www.cbscubaodyssey.com
Gainesville - Water World	3523772822	www.h2oworld.com
Gulf Breeze - Gulfcoast Barracuda Dive Club	8509326397	www.barracudadiveclub.org
Key Largo - Amy Slate's Amoray Dive Center	3054513595	www.amoray.com
Key Largo - Dive In	3058521919	www.diveinflkeys.com
Key Largo - Divers Direct Outlet	3054518034	www.diversoutlet.com
Key Largo - Dual Porpoise	3053042951	www.dualporpoise.net
Key Largo - Horizon Divers	3054533535	www.horizondivers.com
Key Largo - It's A Dive	3054539881	www.itsadive.com
Key Largo - Kelly's on the Bay/Aqua-Nut's	3054511622	www.aqua-nuts.com
Key West - Florida Keys Community College	3052969081	www.fkcc.cc
Key West - Subtropic Dive Center	3052969914	www.subtropic.com
Lighthouse Point - Oceanwatch Foundat'n	9544671366	www.oceanwatch.org
Marathon - FKNMS	3057432437	www.fknms.nos.noaa.gov
Miami - Aqua Cat Cruises	3058883002	www.aquacatcruises.com
Miami - Blackbeard's Cruises	3058881226	www.blackbeard-cruises.com
Miami Lakes - Peter Hughes Diving	8009326237	www.peterhughes.com
Orlando - Northwest Divers	4076589464	www.nwdivers.com
St Pete - Aquatic Obsessions	7273443483	www.aquaticobsessions.com
Tampa - Depth Perception Dive Center	8136893483	www.depthperception.com
Tavernier - Conch Republic Divers, Inc.	3058521655	www.conchrepublic.com
Winter Garden - Florida Scuba Connection	4076541177	www.floridascubaconnection.com
Georgia		
Lawrenceville - Dive..Dive..Dive...	6784072442	www.diveatlanta.com
Hawaii		
Honolulu - Island Divers Hawaii	8089476583	www.islanddivershawaii.com
Kailua - Kona - Jacks Diving Locker	8083297585	www.jacksdivinglocker.com
Kihel - Ao'ao O Na Loko I'a O Maui	8089759059	www.mauiifshponds.info
Lahaina - Project S.E.A.-Link	8086699062	www.projectsealink.org
Waianae - Wild Side Specialty Tours	8083067273	http://sailhawaii.com
Gulf Coast States (LA, AL, FL)		
New Orleans - REEF Field Station of NGOM		www.reefgom.org
Maine		
Portland - Aqua Diving Academy	2077724200	home.gwi.net/~aquadive/
Maryland		
Baltimore - National Aquarium in Baltimore	4435730165	www.aqua.org
Michigan		
Ann Arbor - Huron Scuba Adventures, Inc.	7349943483	www.huronscuba.com
New Jersey		
Belle Mead - The Scuba Connection	9083591250	www.tscscuba.com
New York		
Rome - Delta Divers	3153372300	www.deltadivers.com
Texas		
Denton - Island Divers	9403833483	www.islanddivers.com
Houston - SCUBA Houston	8007817821	www.scubahouston.com
Houston - Texas Gulf Coast Council	2816511277	www.tghcdiveclubs.org
Humble - W.V.V. Diving	2815401616	info@wwdive.com
Washington		
Woodinville - Bubbles Below	4254872822	www.bubblesbelow.com
Pacific Northwest Scuba		www.pnwscuba.com
Canada		
Port Alberni, BC - Bamfield Dive Shop	2507233483	www.dive-shed.com
Sointula, BC - Living Oceans Society	2509736580	www.livingoceans.org
Mississauga, ON - ReefNet Inc.	9056089373	www.reefnet.ca

Field Stations demonstrate a commitment to supporting marine conservation and REEF through financial contributions, teaching fish identification courses, organizing survey dives, and the distribution and sales of REEF survey materials. Please show your support for REEF and marine conservation by patronizing our Field Stations.

Overseas Field Stations

Aruba		
Paradera - Windies Watersports	2975864026	www.windieswatersport.com
Bahamas		
Cat Island - Dive CAT Island/Hawk's Nest	2423427050	www.hawks-nest.com
Nassau - Custom Aquatics	2423621492	www.divecustomaquatics.com
Belize		
Belize City - Seasports Belize		www.seasportsbelize.com
Second Nature Divers	5015237038	www.belizediversity.com
Bermuda		
Flatts - Bermuda Aquarium, Museum & Zoo	4412932727	www.bamz.org
Cayman Islands		
Little Cayman - Little Cayman Beach Resort	3459481033	www.littlecayman.com
Little Cayman - Pirates Point Resort	3459481010	www.piratespointresort.com
Little Cayman - Southern Cross Club	3459481099	www.southernclub.com
Grand Cayman - Ocean Frontiers LTD	3459477600	www.oceanfrontiers.com
Grand Cayman - Wall to Wall Diving	3459456608	www.walltowalldiving.com
Costa Rica		
San Jose - Mundo Arrecife		
Dominica		
Roseau - Scots Head Soufriere Marine Rsv.	7674480140	www.avirtualdominica/ssmr
Honduras		
Utila - Deep Blue Utila	5044253211	www.deepblueutila.com
Utila - Laguna Beach Resort	3378930013	www.utila.com
Mexico		
Akumal - Akumal Dive Adventures	5059923333 (US)	www.akumaldiveadventures.com
Akumal - Centro Ecologico Akumal	529848759095	www.ceakumal.org
Cancun - Oceanus/Lascar sa de cv	529988920501	www.oceanus.com.mx
Cozumel - Aqua Safari	5298720101	www.aquasafari.com
Cozumel - "El Gran Azul" Education Subarina	529878723223	www.isla-cozumel.net
Cozumel - Techs Mex Divers - Las Lunas Inn	529878725235	www.techsmexdivers.com
Jalisco - Boca Divers	523222280713	www.bocadivers.com
Nayarit - Vallarta Adventures	523222971212	www.vallarta-adventures.com
Mahahual - Instituto Del Mar Costa Maya, A.C.	71774313742 (US)	www.institutodelmar.com
Puerto Aventura - Dive Aventuras	5299373512	www.diveaventuras.com
Bonaire		
Kralendyk - Bonaire Dive and Adventure	5997172229	www.bonairediveandadventure.com
Kralendyk - Photo Tours Bonaire	5997173460	www.bonphototours.com
Curacao		
Curacao Sea Aquarium	5994616666	www.curacao-sea-aquarium.com
Puerto Rico		
Guaynabo - Scuba Dogs	7877836377	www.scubadogs.net
Rincon - Oceans Unlimited	7878237436	www.oceans-unlimited.com
St Vincent		
St. Vincent - Dive St. Vincent	7844574928	www.divestvincent.com
Turks and Caicos		
Provo - Flamingo Divers	6499464193	www.flamingodivers.com
Venezuela		
Centro de Actividades Submarinas Squalo	00582418431571	
Virgin Islands		
St. Thomas - Peter Isl.-Paradise Watersports	2844949941	www.bviwatersports.com

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To become a REEF Sustainer, please contact Lad at REEF HQ: (305) 852-0030; Lad@REEF.org.

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Philanthropy points:

- If you know any organization or corporation (employer, doctor, grocery store, etc.) who may have an interest in supporting REEF or collaborating with REEF in some way, please feel free to contact Lad in the Key Largo office, 305-852-0030.
- You can always give to REEF at: <https://www.reef.org/contribform.htm>
- When planning your contributions, always ask your employer if they offer a matching gift program.

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