



The World Federation for Coral Reef Conservation (WFCRC)

Grant Proposal for:

“The Best Practices for Oil Spill Cleanup”

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Executive Summary

The World Federation for Coral Reef Conservation, Inc. (WFCRC) is a 501(c)(3) nonprofit organization that is focused on creating a variety of different programs all designed to preserve coral reefs and other sub-aquatic landscapes in their natural and pristine condition. The organization’s projects will be implemented by core team members, a staff of volunteers, as well as support from professionals in the fields of environmental studies and marine conservation.

The mission of the organization is to advance the understanding, use and conservation of coral reefs through an integrated program of excellence in data gathering/sharing, education, and outreach built upon active and long term partnerships with divers, conservationists, the science community, local island governments and coastal constituents. The broad objectives are aimed at developing this effort and sustaining the same effort for the long term. These objectives are used to set goals that are attainable based on the following criteria. All activities must satisfy three major criteria: 1. Be based on a strong and logical rationale, 2. Demonstrate scientific merit as determined by national experts in the field, and 3. Produce application-oriented results that are clearly useful in industry, management and/or science when broadly implemented.

The World Federation for Coral Reef Conservation, Inc.’s conservation goals are accomplished by working to maintain naturally beautiful marine ecosystems, through programs and services that are organized around a well-developed prospectus. Ongoing evaluation assures progress and cost-effectiveness.

To this point the organization has been funded primarily through private donations. Fundraising is a continuous, ongoing effort. A grant from



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FOUNDATION can assist in the successful implementation of the organization’s Program “**The Best Practices for Oil Spill Clean Up**” by a making a generous donation. We are requesting financial support in the amount of **\$000000**. This funding will be used for costs directly related to program and administrative operations.

Introduction

The World Federation for Coral Reef Conservation, Inc. is a 501(c) (3) nonprofit organization based in Houston, Texas. Founded in March of 2009, this grassroots organization was developed with the goal of increased awareness for the health, safety, and sustainability of coral reefs on a global scale. Over the past two years we have expanded our programs to include other activities, all designed to preserve marine ecosystems in their natural and pristine condition. As an organization we feel that preserving our sub-aquatic environment is extremely important and something that we, as a global society, should take seriously for the benefit of future generations. We seek a balance between stewardship and development.

The World Federation for Coral Reef Conservation, Inc. is the brainchild of Vic Ferguson, an individual who has spent his entire career collecting, sharing, and managing information as a database administrator. Mr. Ferguson is also an advanced scuba diver who has spent a great deal of recreational time in the water observing marine ecosystems and involvement in marine environmental issues. It is this passion for ocean resources and the organisms that live there that led Mr. Ferguson to becoming aware of, and ultimately involved with, conservation organizations that were photographing and documenting diseased coral throughout the world. While these organizations were doing a quality job of recording the damaged coral, they were not using modern GPS technology to



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mark locations for follow-up investigation and/or continued monitoring. It was this revelation that compelled Mr. Ferguson to establish The World Federation for Coral Reef Conservation, Inc. and its many conservation projects.

In order to achieve its mission of preserving marine ecosystems, The World Federation for Coral Reef Conservation, Inc. is currently involved in two projects, the Best Practices for Oil Spill Clean Up and a Worldwide Coastal Networking program. These programs are overseen and administered by well-trained and dedicated core team members and volunteers who are experienced and enjoy what they do. These individuals are also experts in their fields and committed to leading the organization as it grows and expands in the years to come.

The World Federation for Coral Reef Conservation’s strategic plan is based on the real need for a compressive, *single source* of information via the internet, related to marine eco-systems for developing countries. Information like research in oil spill cleanups and coastal concerns that are not readily available to smaller developing island nations. The goal is to establish a global community of concerned coastal constituents and to raise awareness on the importance of having a first response plan in place by providing examples, case histories and input from stakeholders through our the world.

The World Federation for Coral Reef Conservation, Inc. strives to make our oceans a cleaner and healthier place. Through the efforts and services provided by our organization’s various projects we hope to make marine ecosystem conservation something that people feel is important while preserving these ecosystems for future generations.

Problem Statement



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We face many challenges on a daily basis which range in scope from local, to regional, to global. While many of the obstacles we face can be seen as immeasurable, one of the most pressing issues we face is manmade marine pollution. As humans, we share a deep connection with the ocean and its coastlines. At this time approximately 50% of the United States population lives within 50 miles of the ocean's coasts. We are also dependent on our coasts and the ocean for a source of food, recreation, and jobs. In the United States alone, more than 180 million people visit the ocean's coast each year.

At the **current** ocean levels:

- Three-quarters of the WORLD'S mega-cities are by the sea.*
- By 2010, 80 percent of people will live within 60 miles of the coast.*
- ...by 2010 some 80 percent of people will live within 62 miles of the coast, with about 40 percent living within 37 miles of a coastline.*
- "For a while, it was said, 'Oh, two-thirds of all the population lives within 100 kilometers of a coastline,' ... The numbers showed that low-elevation areas (under 10 meters/30 feet) are home to 634 million people....
- "Roughly one in 10 persons in the world lives in this low-elevation coastal zone," Balk says.*

There are also tens of thousands of jobs in fishing, recreation, and tourism which depend on a healthy and functioning coastal ecosystem.¹ With over 70% of the earth's surface being covered by oceans and given its massive impact on all other aspects of our life, preserving our oceans should be a priority. Globally, we estimate half a *billion* people live within 100 kilometers of a coral reef, benefiting from the production and protection these ecosystems. A recent study found that the costs of destroying just *one square* kilometer (0.62 square mile) of reef range

¹ <http://www.oceanfdn.org/index.php?ht=d/sp/i/390/pid/390>



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from about \$137,000 to almost \$1.2 million over a 25-year period when only considering the impact to fishery, tourism, and protection efforts.²

Not only do humans heavily rely on the ocean, but many animals do as well. Scientists estimate that there are 230,000 different marine species currently known to live in the world’s oceans, but the actual total could be up to 10 times that number.³ Many of these species are extremely vulnerable and slight environmental changes can have sever and/or massive impact on marine ecosystems.

There is evidence that the oceans have suffered at the hands of mankind for millennia, as far back as Roman times. But recent studies show that degradation, particularly of shoreline areas, has accelerated dramatically in the past three centuries as industrial discharge and runoff from farms and coastal cities has increased.⁴ One of the most devastating forms of ocean pollution is **oil spills** which can cripple a marine environment. As our need for fossil fuels continues to grow oil companies have turned to offshore drilling and production operations and increasing amounts of oil is transported via tanker ships and oil pipelines. As is this infrastructure ages the potential for leaks and other malfunctions increases. There is also an increased potential for human error. All of these problems can result in devastating spills that take months or even years to clean up.

When oil is spilled or leaked into and the ocean, it spreads very quickly with the help of wind and currents. A single gallon of oil can create an oil slick up to a

² Reefs at Risk - Dirk Bryant, Lauretta Burke, John McManus and Mark Spalding Bryant, Lauretta Burke, John McManus, Mark Spalding

³ <http://en.wikipedia.org/wiki/Ocean>

⁴ <http://ocean.nationalgeographic.com/ocean/critical-issues-marine-pollution/>



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couple of acres in size. The 2010 BP oil slick, for example, spread over 580 square miles in just three days.⁵

When oil enters the water column, it can change composition and becomes what is known as "mousse". This is a sticky substance that clings even more to whatever it comes in contact with. Many marine animals do not know to avoid a slick and some fish may even be attracted to it as it can resemble food.⁶

Some of the many effects on animals which come into contact with crude oil include:

- **Hypothermia and drowning of birds as the oil breaks down the insulating capabilities of feathers, making them heavier and compromising flying ability**
- **Hypothermia in some seal pups as the oil destroys insulating fur**
- **If oil is ingested, it can either poison the animal outright, making them extremely sick or create a level of toxins in their system that then causes poisoning further up the food chain. Birds and other animals often ingest oil when trying to clean themselves. Shellfish and corals are particularly at risk in these scenarios as they cannot escape from an oil slick.**
- **Damage to the airways of birds and animals.**
- **Damage to animal immune systems**
- **Interruption of breeding and fouling of breeding grounds**
- **Thinner bird and turtle egg shells and also damage to fish larvae, causing deformities**
- **Damage to sea grass beds and other shelter/feeding areas**
- **Tainting of algae, which perform a vital role in waterway ecosystems**

Even once the oil appears to have dispersed, it can still lurk beneath the surface of beaches and sea beds. This hidden oil can severely affect marine organisms that burrow, such as crabs, for literally decades. These burrowing creatures are also food for other animals, so if not properly treated the cycle of poisoning can

⁵ <http://www.greenlivingtips.com/blogs/164/Effects-of-oil-spills.html>

⁶ Ibid



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continue for many years. There is really no aspect of a marine and coastal environment that is not in some way adversely affected by an oil spill. The closer the spill occurs to the shoreline, the more pronounced the damage will be due to the fact that coastal zones are home to more concentrated and diverse populations of coral, birds, and animal life in contrast to deeper waters.⁷

However, The National Oceanic and Atmospheric Administration (NOAA) recently identified deep-water corals that as a direct result of the Deepwater Horizon spill in the Gulf of Mexico are dead and dying. “Research has also documented dead and dying corals in the vicinity of the Deepwater Horizon well” (see attached communication from NOAA, dated Jan. 31, 2011).

Through our organization’s efforts we would like to provide coastal communities around the world with the resource information necessary to quickly and effectively clean up oil spills immediately after they occur in an effort to minimize any negative environmental impact. We feel that by helping to preserve marine ecosystems we are doing a service to *everyone* in our global community, specifically those who rely on the ocean for their livelihood. We are also preserving these delicate ecosystems for future generations to experience and enjoy.

Goals & Objectives

The overall goal of The World Federation for Coral Reef Conservation, Inc.’s programs is to preserve the world’s sub-aquatic and marine ecosystems in as natural and pristine a state as possible. In support of this goal, our organization has established the following primary goals:

⁷ Ibid



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- **Secure the funding needed to successfully implement all of our programs on a global scale**
- **Make vital information related to oil spill cleanup readily available online on a single website that is user friendly and reduces searching for problem-solving actions, all delivered via a GIS dashboard**
- **Promote data and information-sharing worldwide and actively contact persons involved in coral reef management and protection**
- **Increase awareness and promote the need for the conservation of the world’s sub-aquatic and marine ecosystems by creating a network of concerned coastal citizens**
- **Work with leading experts and researchers to gather all the appropriate information necessary to publish a “Best Practices for Oil Spill Clean Up” portal**
- **Develop a working relationship with all oil companies that are currently involved in offshore drilling projects**
- **Supply methods and standards for water testing and assessing impacts on the marine ecosystem**
- **Continue developing our organization’s name recognition and build a strong reputation for delivering the highest quality services possible with the resources we have available**
- **Build and develop long-standing relationships and partnerships with other organizations that share our organization’s vision**
- **Focus on the events that we can have a positive impact on and not on the ones we cannot have an impact on.**

Methodology

To accomplish the objectives stated in the previous section, The World Federation for Coral Reef Conservation, Inc. will use the following methods. It was decided to follow this course of action based on the expertise of the program



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director, as well as the success of similarly structured conservation organizations. We will also develop new avenues of delivering best practices to end users.

Best Practices for Oil Spill Clean Up

The first of our organization’s six major programs is our Best Practices for Oil Spill Clean Up. The goal of this program is to create a user friendly electronic database that has a variety of information that is all contained in one source and is easily accessible, understandable and can be implemented with limited resources. This geo-database will be accessible to end users and anyone else who is interested in marine conservation web based applications.

In order to compile the information contained in our database we will be working with a variety of companies within the oil industry, including production, distribution and cleanup organizations. Many of these companies have developed lists of cleanup methods. The information we provide must also outline different cleanup methods based on different types of spills and other events. In most cases this information is already available but is just not readily accessible to those individuals who are most frequently the end users. In order to publish this information on our website we will need to get consent from the organizations that have created these materials.

Once the database has been completed we will be working diligently to reach out to the managers of Marine Protection Areas (MPA’s), tourism bureaus and other stakeholders who would benefit from having this information. Our objective is to make this information available to these individuals before they need it so if an oil spill occurs in their area they will be able to quickly and efficiently respond. In many cases response time is directly correlated to the amount of damage



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inflicted, the quicker the response the fewer affected areas. A large part of this project will be making connections with local people who will ultimately be the end users of these techniques, thus bringing this information to a logical conclusion while raising awareness for the need for a first response plan.

The focus of our distribution efforts will be underserved areas of the world where it is much more difficult to locate the parties responsible for the spill and hold them accountable for the cleanup efforts. Because we are focusing our efforts on underserved areas of the world the cleanup procedures we provide will need to be designed in a way that the local constituents can carry them out inexpensively with the resources they have available. Unfortunately, in many situations these resources will be extremely limited which will require the development of nontraditional methods. One example of this would be to contain the spill using straw or other absorbent materials rather than expensive booms or dispersants which are traditionally used in the developed world.

Through this living program we would like to increase the availability of information and as a result increase response times and the efficiency of oil spill cleanups. This increase in response times and efficiency will help in minimizing the area affected by the spill and the impact on the affected area.

Although coral reefs have become the subject of thousands of research projects in the past few years, remarkably little has been done to attempt a global assessment of *where* and *what* are the most pressing issues. Yet, such information is vital if effective action plans are to be devised. Our program identifies areas most at risk, as well as to highlight those with varying degrees of sanctity, by correlating what is known about the distribution of reefs with the distribution of known human impacts.



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The result is a monumental overview, one that can be used to help guide conservation efforts on a grand scale—as well as up close, locally. As human population grows, so will the pressures on the natural systems that sustain us.

Reefs at Risk: A Map-Based Indicator of Threats to the World's Coral Reefs makes it possible to pull back and gain perspective on past problems as an effective way to anticipate—and perhaps prevent—potential disasters in the making. The fate of coral reefs, the ocean, and humankind forty years from now and forevermore will depend on the intelligence, motivation, and caring of people now alive. In that spirit, this report provides hope that we may succeed.⁸

Worldwide Coastal Networking Program

Our next project we are developing is our *Worldwide Coastal Networking* program. This project works to form a connected network or community of citizens who share a passion and commitment to working together to preserve coastal environments, coral reefs and other marine ecosystems.

We will be creating this network through the development of a forum which will provide a platform for participants to share information related to coastal and other issues taking place within our target areas. The majority of the participants in our network will be individuals such as fisherman and others who are regularly on the water and will be able to provide regular updates as to changing conditions.

⁸ Sylvia A. Earle

Explorer-in-Residence, National Geographic Society Chairman, Deep Ocean Exploration and Research Organization



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These participants will play a role similar to a weather spotter by observing and reporting information that can impact reefs and coastal communities. This information can be related to a variety of topics that include, but are not limited to, environmental hazards, weather patterns, water conditions, fish and mammal movement, scientific studies and results, governmental legislations, ecosystem-based management-results and planned programs, Marine Protected Areas (MPA) programs, environmental events, man made threats like oil spills, erosion events and sediment flows, as well as a forum to express concerns and comments by coastal constituents.

This information can then be used to provide valuable insight related to the severity, scale and location of the incident and well as the responsible party and other valuable information and builds a digital history of coastal events.

The information we collect will then be entered into an interactive website/GIS dashboard that will be accessible to the public via web based applications on hand held devices. This website will use real-time satellite imagery and many other data sets to illustrate exactly what is taking place in specific coastal areas. We will also be collecting aquatic and climatic data using GIS technology which will be integrated into the website to provide additional information to the user.

This program will dovetail with our Best Practices for Oil Spill Clean Up project in an effort to more efficiently and better achieve our end goal of preserving coral reefs and marine landscapes. The stakeholders we identified for the “Best Practices for Oil Spill Cleanup” program will be utilized in The Worldwide Coastal Networking program.

Future Programs



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As our organization moves forward, we will also be working to develop other programs and efforts including:

- **“Standardization Program.”** Our next effort will be to establish a framework to standardize aquatic data gathered by divers worldwide. We will use input from the managers of MPA's as well as the individual citizens, scientists, volunteers, and divers to organize and raise awareness of gathering data that fits a standard that is usable worldwide. For example, data gathered in the Caribbean would meet the same level of quality and detail as data gathered in Australia.
- **“Long Term Diver Participation.”** We are also currently developing programs that will involve divers and consumers of ocean resources for long term engagement in MPA conservation. Rather than a diver's participation ending with their dive, we want to encourage involvement in management and protection efforts, solicit data such as diver profiles and observations, and expand our network of stakeholders to involve a broader group of marine resource stakeholders. We will identify emerging technology, issues and empower anyone with an interest to get involved and be a part of the process.
- **“Land Based Threats to Coral and Oyster Reefs Program.”** One of our core ideas is that all of our programs focus on problems that can be resolved in the not too distant future and that we can see results measured in years rather than lifetimes. Land-based threats to coral and oyster reefs are very identifiable threats that can be approached in a manner that reduces negative human impacts on these reefs. Continue to raise the awareness for the need for a First Response Plan to be developed and implemented.
- **“Outreach to the Youngest Consumers of Ocean Resources Program.”** To continue the effort of sustaining the world's coral reefs well into the future, we must pass along our conservation principles and ideals to the next



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generation – the youngest ocean consumers - so they will understand the importance of these natural reef systems and carry on our efforts. As part of our outreach, we will develop educational programs targeting young people and lifelong learners.

- **“Coral Credit Program”** One of the biggest threats to our coral reefs is the sale of live coral to curio and aquarium shops. Because coral is so popular for aquariums, it is a practice that may be difficult to stop and will require a unique approach that involves collaboration from all involved in the process. Our approach is to develop a system of “Coral Credits” that a buyer can purchase much like “Carbon Credits.” Buyers are given an opportunity to help pay for the preservation of other coral by purchasing or trading offsets. These “Coral Credits” could be purchased or traded at a variety of locations including aquarium and dive shops and web sites that sell coral.

The World Federation for Coral Reef Conservation, Inc. is a paperless organization that wants to achieve changes in years, rather than lifetimes. Our hope is that other nonprofit organizations will see the work we are doing and collaborate on the projects we have started. The organization’s conservation projects will be operated using the help of highly qualified individuals, who have expertise in their particular service area. The Executive Director of the organization will oversee all staff and volunteer activities, while continuously employing his years of training and experience. Overall, the organization aspires to preserve our waters in a naturally pristine condition to be shared by the entire global community. The organization will begin its operations upon successful funding.

Evaluation



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The World Federation for Coral Reef Conservation, Inc. is an outcome based organization, and we rely heavily on continuous evaluation and documentation of our programs and activities in an effort to ensure continued productivity and success. Twice a year the organization’s Executive Director will gather all of the data regarding the organization’s activities, programs and financial records and compile a report. The board of directors will then use this report to evaluate the organization’s state of funding and make decisions related to the future of the organization’s programs.

We will also be working and meeting with the end users of our program materials to gather feedback on our programs. This interaction will allow us to determine what aspects of the program were helpful and what aspects of the program need to be revised to better achieve our goals and objectives. We will also be inquiring as to which techniques they used and the success of these techniques towards achieving the desired outcome.

Annually, the organization’s staff and volunteers will convene to review the year’s operations, evaluate success and pitfalls, and plan the following year’s programs. At this time staff will assess the resources, needs, and budget for our programs; evaluate the needs of our target communities, as well as input from other sources; and develop a plan for the upcoming year.

All funders of The World Federation for Coral Reef Conservation, Inc. will receive semi-annual reports during the award year, as will board members, the executive director, and other interested individuals. If our organizations objectives for the first year are met, we will consider the program to be successful. In the long term the organization will be defining our success through an increase in our ability to



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provide our target communities with the knowledge and resources they need to successfully address the issues they may face.

Sustainability

The World Federation for Coral Reef Conservation, Inc. has established a strong history of obtaining funding for our programs and is confident in receiving ongoing funding for the organization. Our organization survives from year to year through our financial efficiency with the funding we obtain. The organization is expected to have the support of foundations, industry, and individuals for its continuous support.

In addition to these monies, the organization’s Board of Directors will increase the amount of unrestricted funds for our organization through direct mail requests, the solicitation of corporate sponsorships, and fundraising events. In upcoming years The World Federation for Coral Reef Conservation, Inc. will seek to obtain continuation grants from both foundations and corporate sponsors in an effort to continually provide the highest quality programs and services possible. It is our ongoing goal to provide financial stability to the organization by identifying funding sources, including other organizations that share our passion to provide these services to communities around the world.

The World Federation for Coral Reef Conservation, Inc. is currently developing a gift shop, which will be operated through our organization’s website. This gift shop will sell products and merchandise that feature our organization’s logo. The revenue generated from the sale of these products will serve as an additional funding source for the expansion and continuation of the programs our organization is currently offering as well as the implementation of future organizational activities.



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In the past the organization has received many individual donations, and during 2012 and 2013 the growth rate of the donor base is expected to increase exponentially with the addition of new key stakeholders. In-kind donations will provide an additional source of revenue for the organization. We plan to continue funding our organization in this manner as long as it is necessary.

Potential Impacts

With the current consumption of ocean resources, changes are harder to model, and the effects on coral reefs are likely to include greater physical damage by storms and more frequent instances of coral bleaching. This increase in “natural” stress levels will leave coral reefs in many parts of the world *more vulnerable to human disturbances*. For decades, the demand for oil has grown beyond our ability to deal with the negative impacts of a hydrocarbon dependent society. With the increased worldwide drilling and production operations in area that are not necessarily environmentally responsible the burden of responding to an oil spill falls on local constituents. A current and relevant example would be the massive oil spill in Nigeria. In many cases, these local residents either lack the ability and or knowledge to effectively respond in a timely manner to save and preserve their local environment.



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Notes

1. Robert Richmond, “Coral Reef Resources: Pollution’s Impacts,” **Forum for Applied Research and Public Policy** 9, no. 1 (Spring 1994), 55-56.
2. Mats Bjork, Salim Mzee Mohammad, Marie Bjorkland, and Adelaida Semesi, “Coralline Algae, Important Coral Reef Builders Threatened by Pollution,” **Ambio** 24, nos. 7-8 (December 1995), 502-4.
3. Barbara Brown, “Disturbances to Reefs in Recent Times,” in **Life and Death of Coral Reefs**, ed. Charles Birkeland (New York: Chapman and Hall, 1997), 370-72.
4. Global Environment Facility, **The Hashemite Kingdom of Jordan: Gulf of Aqaba Environmental Action Plan** (Washington, D.C.: World Bank, 1996), 5.
5. James Bohnsack, “The Impacts of Fishing on Coral Reefs,” in **Proceedings of the Colloquium on Global Aspects of Coral Reefs: Health, Hazards and History** (University of Miami, 1993), 196-98.
6. Simon Jennings and Nicholas Polunin, “Impacts of Fishing on Tropical Reef Ecosystems,” **Ambio** 25, no. 1 (February 1996), 44-46.
7. Callum Roberts, “Effects of Fishing on the Ecosystem Structure of Coral Reefs,” **Conservation Biology** 9, no. 5 (October 1995), 989-92.
8. Pennisi, “Brighter Prospects.”
9. Gomez, Alino, Yap, and Licuanan, “A Review of the Status of Philippine Reefs,” **Marine Pollution Bulletin** 29, nos. 1-3 (1994), 65-66.
10. Jorge Cortes, “A Reef Under Stress: A Decade of Degradation,” in **Proceedings of the Colloquium on Global Aspects of Coral Reefs: Health, Hazards and History** (University of Miami, 1993), 240-45.
11. Callum Roberts, Nigel Downing and Andrew Price, “Oil on Troubled Waters: Impacts of the Gulf War on Coral Reefs,” in **Proceedings of the Colloquium on Global Aspects of Coral Reefs: Health, Hazards and History** (University of Miami, 1993), 132-37.
12. UNEP/IUCN, **Coral Reefs of the World. Volume 2: Indian Ocean, Red Sea and Gulf** (Gland, Switzerland: IUCN, 1988), xxi.
13. Brown, “Disturbances to Reefs,” 373-4.
14. Brown, “Disturbances to Reefs,” p. 376.
15. Joby Warrick, “Coral Reef off Florida Keys Caught in Wave of Deadly Disease,” **Washington Post**, February 9, 1997, A3.
16. Rodney Salm, “The Status of Coral Reefs in the Western Indian Ocean with Notes on Related Ecosystems,” working paper prepared for the International Coral Reef Initiative Workshop, Seychelles, March 1996.



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17. Mark Spalding, Francois Blasco, and Colin Field, eds., **World Mangrove Atlas** (Okinawa: International Society for Mangrove Ecosystems, 1997), 11.

A globalization effort to share information...



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Additional Reading

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Silver Spring, Maryland 20910
Jan 31 2011

Mr. Vic Ferguson, President/Founder
The World Federation for
Coral Reef Conservation
P.O. Box 942
Safety Harbor, Florida 34695
Dear Mr. Ferguson,

Thank you for contacting me regarding the current status of research being conducted on coral that may have been affected by the BP Deepwater oil spill. The National Oceanic and Atmospheric Administration (NOAA), along with other federal agencies and academic partners, has finished several coral research missions to help determine injuries that may have occurred. We will continue to sample and monitor these shallow corals for evidence of oil exposure and impact.

In our research on deep-water corals, we have been working closely with deep-coral scientists from academia and other government agencies. This includes Natural Resource Damage Assessment (NRDA) focused work and non NRDA-focused work funded by the National Science Foundation, the Department of Interior's Bureau of Ocean Energy Management Regulation and Enforcement (BOEMRE), the U.S. Geological Survey, and NOAA's Office of Oceanic and Atmospheric Research grant monies. Overall, these combined efforts have documented that certain deep-water coral communities have been exposed to oil. The "fingerprint" of the oil is consistent with source oil from the Deepwater Horizon (DWH) release; and the spatial location of the oil is consistent with monitoring and modeling of oil movement from the DWH release. Research has also documented dead and dying corals in the vicinity of the Deepwater Horizon well. Quantifying the spatial extent and severity of these impacts is still in the early phases and plans are to continue this work through 2011,

It is through the combination of these scientific studies and observations that the damages to coral will be fully characterized and quantified. We are committed to ensuring that all injured resources are restored. The coral research conducted thus far is still in the early stages, NOAA, along with our academic and government partners, will continue to conduct quantitative investigations and monitoring that is essential to gaining a comprehensive understanding of the impacts of the BP Deepwater oil spill to the Gulf.

Sincerely,
David M. Kennedy
Assistant Administrator for
Ocean Services and Coastal Zone Management