



# CAN-062-Coral Reef Habitat Mapping- World's Oceans

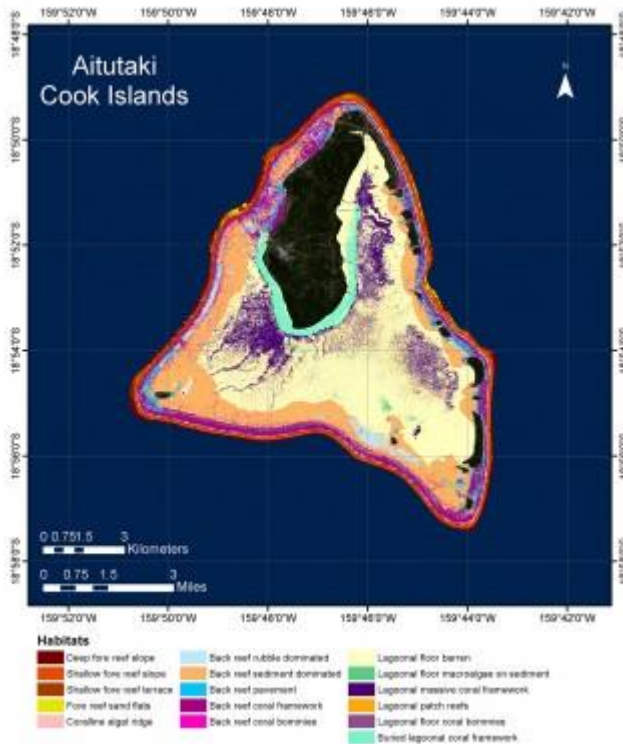
[Join us to save reefs](#)

Vic Ferguson

The World Federation for Coral Reef Conservation 281.971.7703 P.O. Box 311117 Houston Texas 77231

9/1/16

## Khaled bin Sultan Living Oceans Foundation



We produce high-resolution coral reef habitat maps of previously unmapped, remote coral reef systems around the world. The maps we create are a product of extensive scientific research. We use a [process](#) that involves satellite imagery combined with a scientific diver's inspection of the sea bed, called ground-truthing, to create extremely detailed maps that show the composition of the sea floor which can be made of sand, rubble, live coral or seagrass among other categories. These habitat maps are entered into a GIS so that they can be accessed by anyone with an internet connection.

The GIS also contains a depth layer, some geo-referenced video layers to allow a virtual diver to explore a precise underwater location on the earth's surface, and a variety of tools and analytics useful for understanding the composition of a given area.

We do this because the world's coral reefs are in crisis. Benthic habitat maps are an essential tool in coral reef conservation, providing a snapshot of reefs which scientists and managers can use to track changes in reef composition and structure over time. All the maps we produce from our field research and for the Global Reef Expedition are available to view and download on our website and can be used for scientific analyses,

education, and management. We also offer use of the data that contributed to the maps.

The production of these maps are made possible by the generous support of Prince Khaled bin Sultan, who won the prestigious [Peter Benchley Award](#) for this work exploring and creating the first detailed maps of some of the world's most remote coral reef ecosystems.

### World Reef Map

Our [World Reef Map](#) is a global, online, interactive map that allows users to explore all of the coral reefs we have ever surveyed and mapped. This [award-winning](#) map is the result of years of work by an extended team of dedicated scientists and many months of field research in remote regions of the world. The Foundation has made these coral reef habitat maps available to the public in this online platform, and the GIS data that this map is built upon is available for governments and conservation organizations to download and use in their efforts to protect and conserve coral reefs.



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**Bahamas Web Map**

Our [Bahamas Web Map](#) was created to support the design of marine protected areas in The Bahamas. In addition to the benthic habitat maps we created for Hogsty Reef, Cay Sal Bank and the Inaguas on the Global Reef Expedition, this interactive map includes data layers on biodiversity, fish habitat, and the impacts of hurricanes and climate change. The Bahamas Web Map is currently being used to design a sustainable network of marine protected areas (MPAs) in The Bahamas.

## Atlases

Our [Atlases](#) contain detailed habitat maps along with a summary of our findings on the health and resiliency of coral reefs in a region. We publish an Atlas as the final product of our coral reef research in a region. Hard copies are distributed to our partners, government officials, local leaders, and local conservation organizations. Digital versions of our Atlases are available on our website.

Our maps are made in partnership with [Dr. Sam Purkis](#) and his remote sensing lab at [Nova Southeastern University](#).

## Underwater Street View

We invited [XL Catlin Seaview Survey](#) to join us on the [Global Reef Expedition](#) in the [Solomon Islands](#) to use their custom underwater camera to take stunning 360 degree imagery of the reefs. The virtual dive they created with footage of Marovo Lagoon – the largest saltwater lagoon on the planet – is now available for anyone to explore on [Google Street View](#).

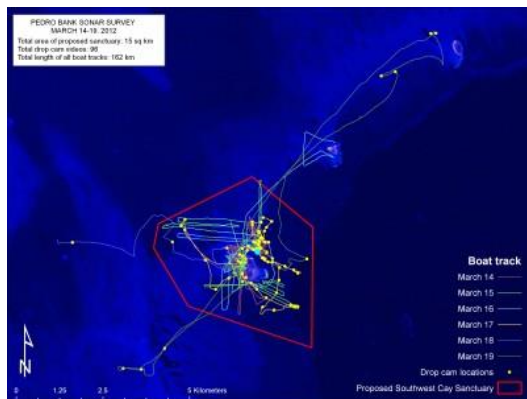
This past World Oceans Day we released [360° Solomon](#), a film about our partnership with XL Catlin Seaview Survey that shows how we collected imagery and data of coral reefs in the Solomon Islands.



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The Khaled bin Sultan Living Oceans Foundation is dedicated to the conservation and restoration of living oceans and pledges to champion their preservation through research, education and a commitment to Science Without Borders.®

# Habitat Mapping



Combining satellite imagery with information gathered from our benthic habitat surveys and geo-referenced photos and videos, our detailed habitat [maps](#) of coral reef ecosystems provide a comprehensive snapshot of life on a reef in one place and time.



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## Reef Maps & GIS

We gather high-resolution imagery and data in the field to create maps of the habitat on the ocean floor and combine them with other geodata sets to create a Geographic Information Systems (GIS) map of an area.

GIS combines cartography, statistical analysis and database technology to capture, store, visualize, analyze, and interpret data. This allows us to reveal relationships, patterns and trends through habitat mapping.

The interactive habitat maps we create are produced through a combination of imagery from remote sensing (from various satellite and aircraft sensors) and “ground truthing” data collected during field work.

### GROUND TRUTHING



Ground truthing validates the imagery giving higher accuracies. This is known as a “supervised analysis.” For most regions, we have also produced a map of “optical bathymetry.” These are cost effective maps of relative water depths in coral reef ecosystems which we have validated with depth measurements taken during ground truthing. While these optical bathymetry products are not suitable for navigation, they are useful for scientific interests and for resource management applications.

### VIDEO

Additional “layers” of data are available on some maps. For example, many of the maps include representative video clips depicting the various seabed communities.

These types of GIS maps can be extremely useful to policymakers and conservation organizations developing management strategies to ensure the long-term health of coral reefs and associated shallow water marine ecosystems. We work with local governments to ensure the GIS data and seafloor habitat maps we create will be relevant and useful to them.

Our [web-based maps](#) allow those without access to professional GIS software to have easy access to seafloor habitat maps for viewing and querying. We also make all our GIS data files available for download for those who may want to use them, and create [atlases](#) from these maps that are available for purchase or download on our website.



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## Related Publications:

- 2016

### Putting Preservation on the Map: Living Oceans Foundation Restoring the World's Oceans thru Science

This article, published in What's Up Magazine of Annapolis (Maryland), features an interview with Living Oceans Foundation Executive Director Captain Philip G. Renaud and discusses the Foundation's headquarters relocation to Annapolis along with their charter and mission of preserving and ...

- 
- 2015

### WNAV News Interview with Capt. Phil Renaud

WNAV's Donna Cole interviews Philip Renaud, Executive Director of the Khaled bin Sultan Living Oceans Foundation. Interview with Capt. Phil Renaud WNAV News (on SoundCloud) Nov 13, 2015 By Donna Cole How did the organization pick Annapolis for their headquarters, ...

- 
- 2015

### Global Reef Expeditions Assess Coral Reef Health

Prince Khaled bin Sultan of Saudi Arabia had a dream: to fund research expeditions focused on the health of the ocean. The dream became reality when the Living Oceans Foundation was founded in California. Global Reef Expeditions Assess Coral Reef ...

- 
- 2015

### Solomon Islands Field Report

Between October 26, 2014 and November 24, 2014, the Khaled bin Sultan Living Oceans Foundation conducted a coral reef research, outreach and education mission to map and characterize the shallow marine habitats and assess the status of coral reefs and ...

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[EXPLORE OUR MAPS](#)



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### Habitat Mapping Features

[Cotton Candy Corals](#)

[Nemo and the Zombie Anemone](#)

[New Study Reveals Worrying Future for Corals](#)

[MORE...](#)

### All Updates

#### Putting Preservation on the Map: Living Oceans Foundation Restoring the World's Oceans thru Science

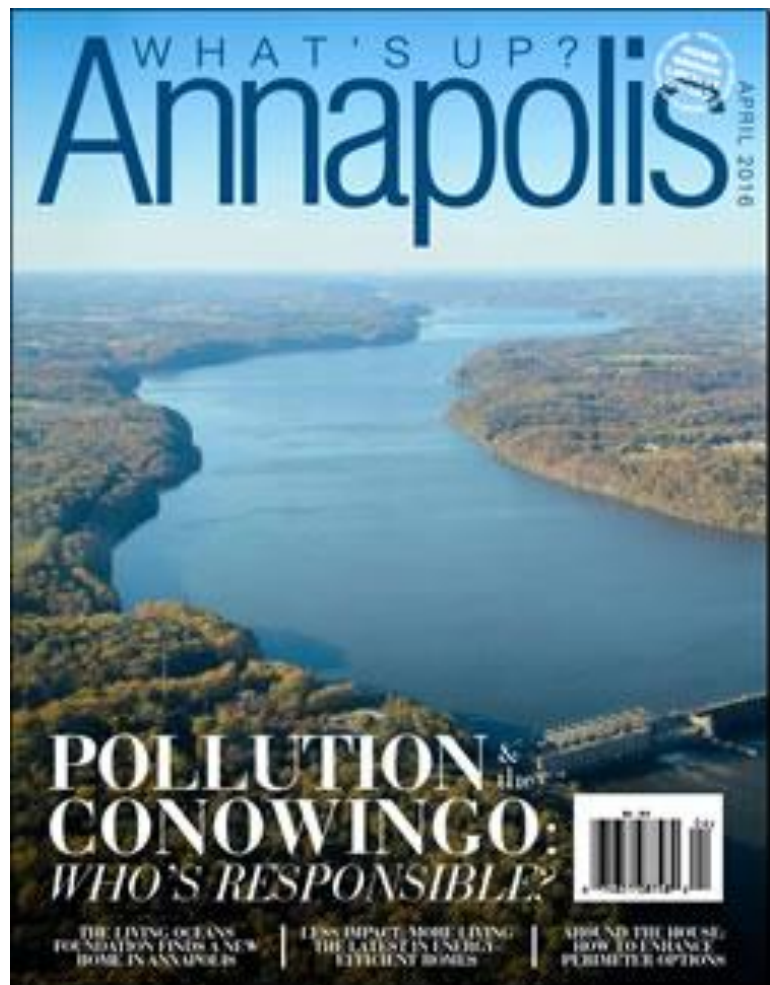
April 14, 2016

This article, published in What's Up Magazine of Annapolis (Maryland), features an interview with Living Oceans Foundation Executive Director Captain Philip G. Renaud and discusses the Foundation's headquarters relocation to Annapolis along with their charter and mission of preserving and ...

### Best Photos of 2015

#### Palau's Archipelago — A Nation of Islands and Reefs

November 24, 2015





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This article, published in the Seven Seas travel magazine, was written by KSLOF science team member Keith Ellenbogen, a Fellow of the International League of Conservation Photographers (iLCP) during the Global Reef Expedition mission to Palau. Palau's Archipelago — A ...

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Vic Ferguson  
The World Federation for Coral Reef  
Conservation  
Executive Director  
P.O. Box 311117  
Houston, Texas 77231  
[vic.ferguson@wfcrc.org](mailto:vic.ferguson@wfcrc.org)  
[www.wfcrc.org](http://www.wfcrc.org)  
281.886.7428 (office)  
281.309.1201 (cell)

*The only thing necessary for the triumph of evil is that good men do nothing"....Edmund Burke*