



ALLEN CORAL ATLAS

How can global mapping and monitoring enhance management and policy?

Brianna Bambic

Global Engagement,

Allen Coral Atlas

Arizona State University/National Geographic Society

bbambic@asu.edu

TEAM



Brianna Bambic, Global Engagement, Arizona State University/
National Geographic Society, bbambic@asu.edu



Andrea Rivera-Sosa, Project & Outreach Manager, Global
Conservation Science, [Coral Reef Alliance](mailto:arivera-sosa@coral.org). arivera-sosa@coral.org

Overview

1. What is the Allen Coral Atlas (Atlas)?
2. Monitoring using satellites
3. Allen Coral Atlas Impact
4. Collaboration, next steps



ALLENCORALATLAS.ORG



ALLEN CORAL ATLAS

253,000 km²
of shallow coral reefs mapped

480+ datasets
used to calibrate and validate
global habitat maps

2.25 million
satellite images used

Collaboration

The Allen Coral Atlas

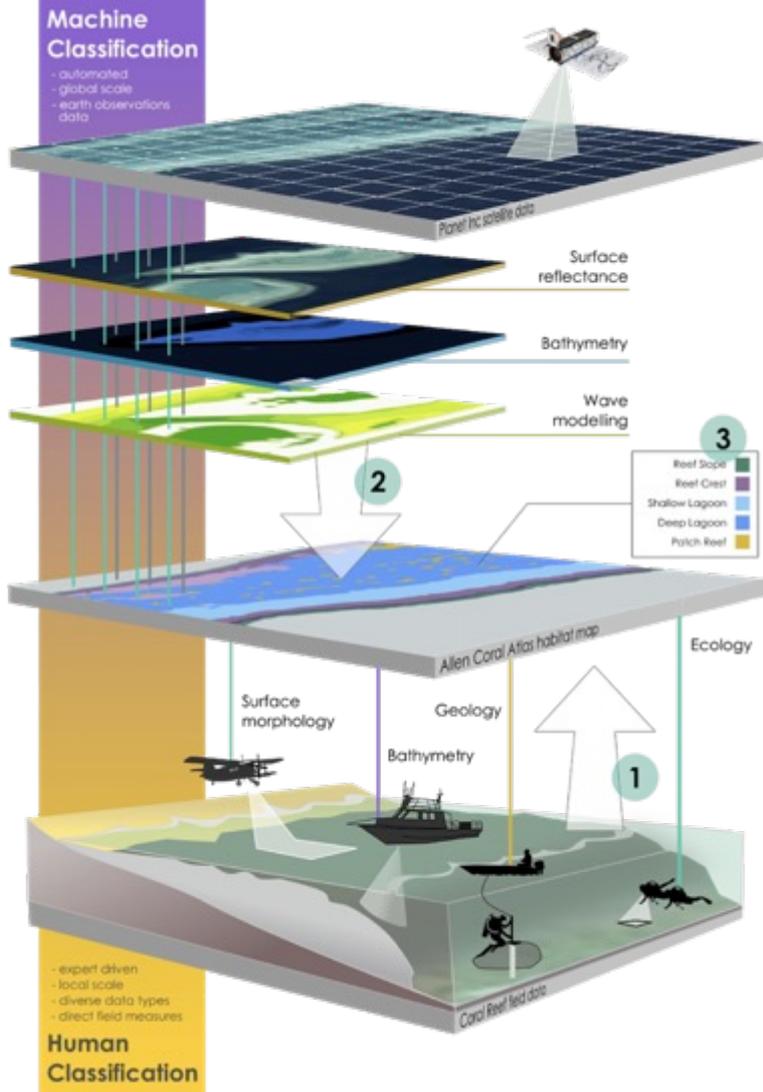
Vision: A planet with healthy and resilient coasts where data contributes to sustainable relationships between communities and coastal ecosystems.



How was the Atlas made?

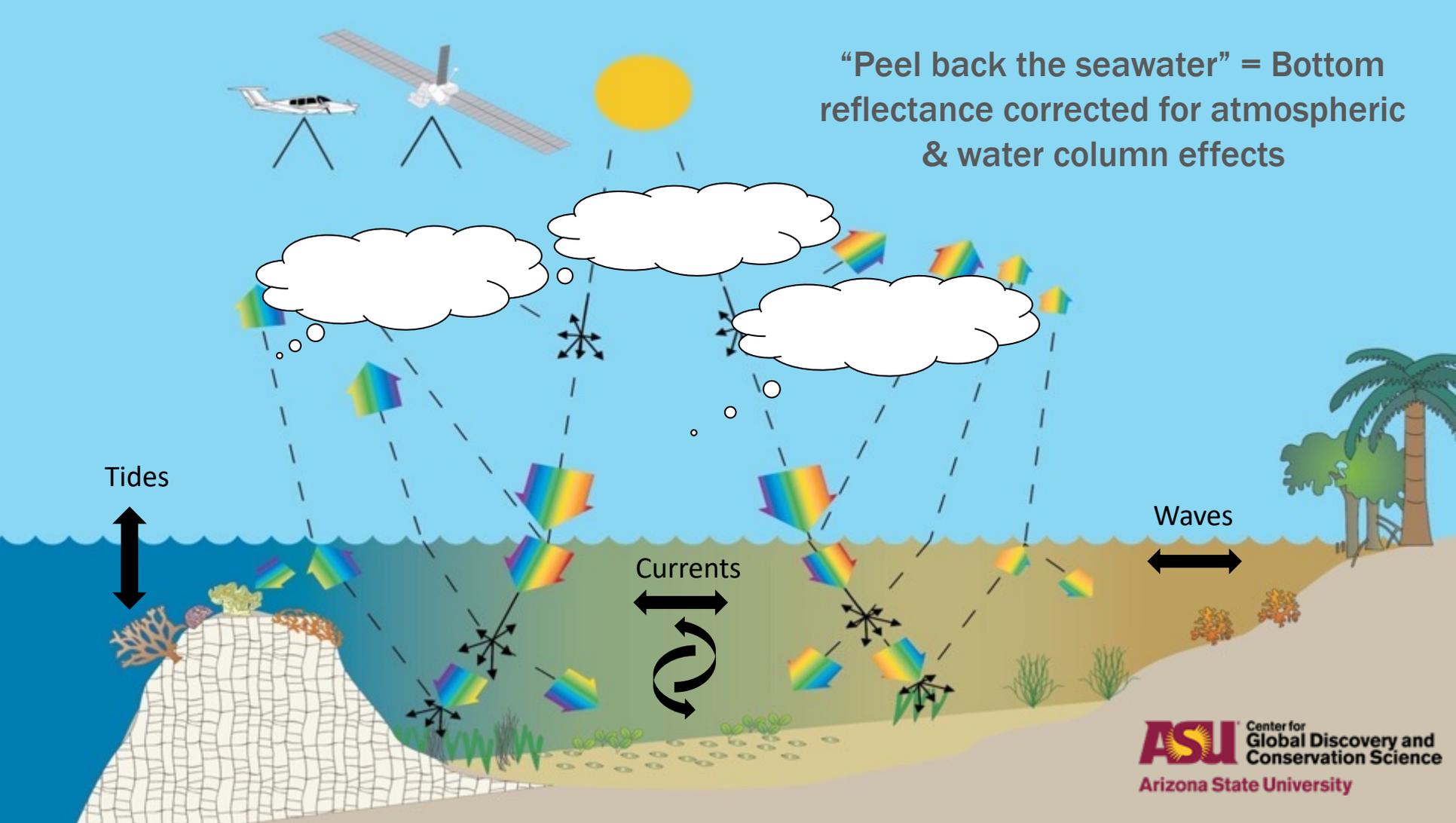


Field teams & existing data





“Peel back the seawater” = Bottom reflectance corrected for atmospheric & water column effects



Mapped/Monitored Areas



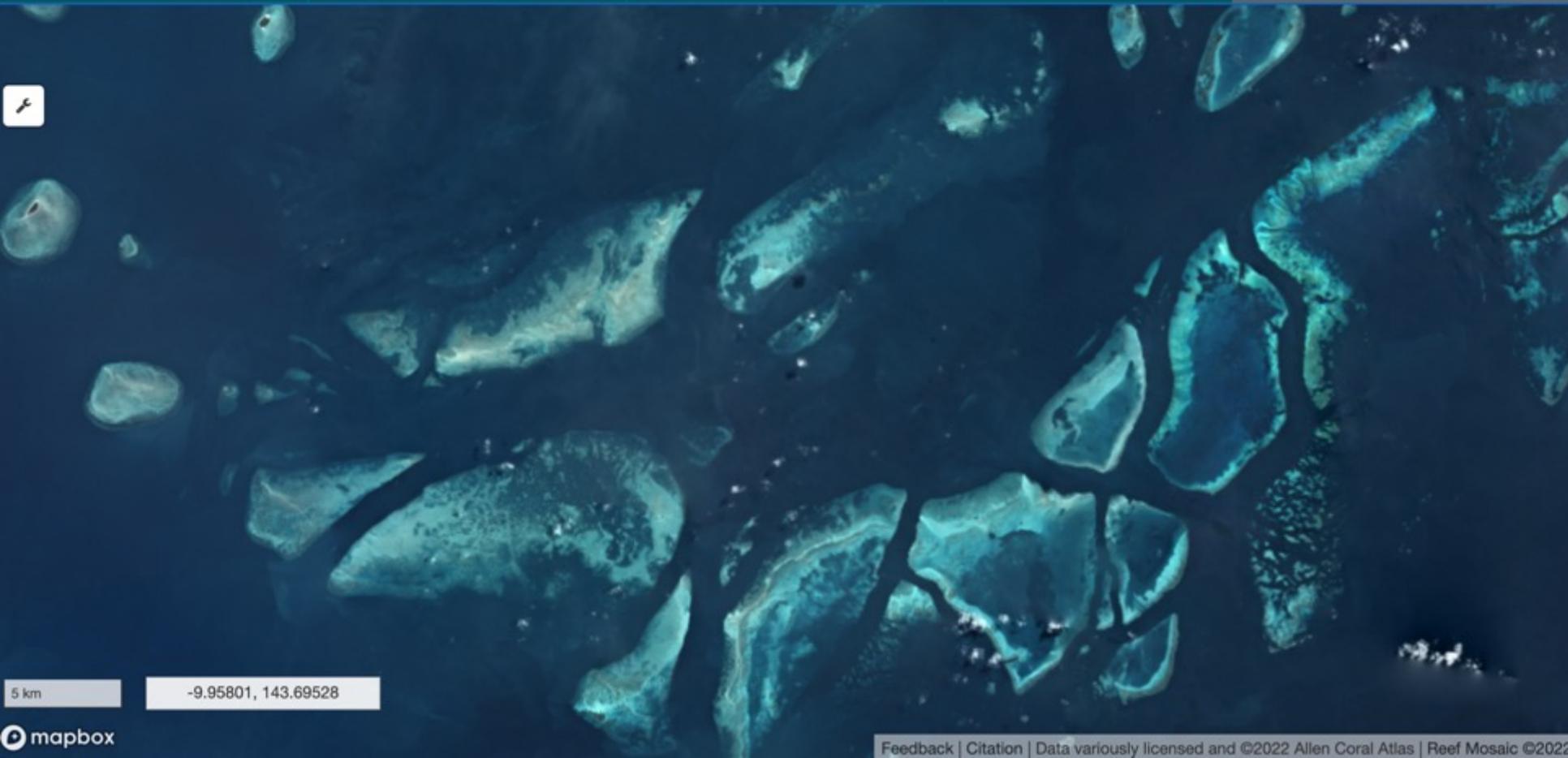
My Areas



 Mini Map

 Legend

 High Resolution



5 km

-9.95801, 143.69528

Habitat Mapping - Satellites to pixels



Zoom to 5m resolution

Assign pixels to map classes

Use machine learning and semi-automated process



Find Location

Central South ...

My Areas

Mini Map

Legend

High Contrast Mode

Info/Help

Demo

Stats

Download data

Edit Area

Selected area: 214.526 km²

Mapped area: 50.625 km²

Geomorphic zones



Benthic classes (in selected geomorphic zones)



	km ²	%		km ²	%
Reef Slope	3.89	7.69	Coral/Algae	21.11	41.70
Sheltered Reef Slope	1.53	3.03	Seagrass	0.38	0.76
Reef Crest	1.35	2.67	Microalgal Mats	0.58	1.15
Outer Reef Flat	9.61	18.97	Rock	5.04	9.95
Inner Reef Flat	15.05	29.72	Rubble	13.91	27.48
Terrestrial Reef Flat	8.02	15.85	Sand	4.90	9.69
Plateau	0.03	0.06			
Back Reef Slope	4.67	9.23			
Shallow Lagoon	3.34	6.61			
Deep Lagoon	3.13	6.18			

Data Source: Planet Dove Imagery & Research Partners



2 km

-17.60360, -149.91273

Coral Triangle Dataset

Country

 Global

 Indonesia

 Papua New Guinea

 Solomon Islands

 Coral Triangle

 Malaysia

 Philippines

 Timor-Leste

[Advanced](#)

Theme

Keyword

Dataset available for download All Yes No

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s to

Search Result: 3 records



Full Screen



Export Search Result



Drag a column header here to group by that column

	Country ▼	Theme ▼	Title ▼	Last Update ▼	
 	Coral Triangle	Miscellaneous	Marine Population Connectivity	26 Jul 2013	
 	Coral Triangle	Oceanography	Climatological SST and Climate Projection	26 Jul 2013	
 	Global	Habitat (Marine)	Global Distribution of Coral Reefs (2010)	08 Jun 2011	

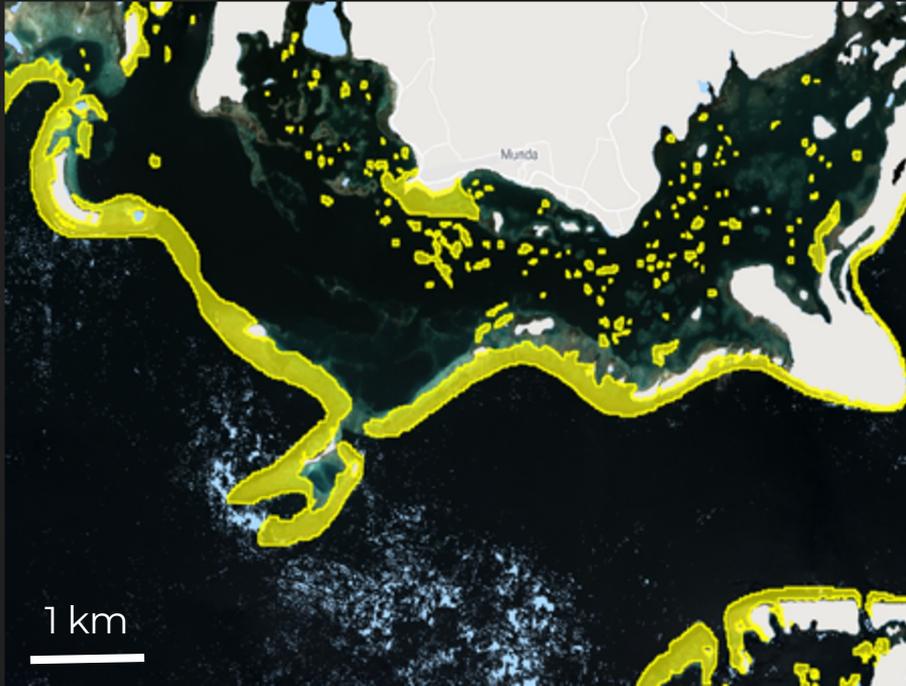
Comparison: Can you support both?

	UNEP WCMC 2018		ACA
Source of Maps	Millenium 85%	Others 15%	ACA
Methods	Manual delineation	Various	machine learning combined with object based analysis informed by reference samples, depth, imagery, slope, (waves)
Input field data	Expert knowledge	Unknown	various data set and expert knowledge combined to reference samples
Input image data	Landsat	Unknown	Planet Dove low tide mosaic
Depth range	0 to where reef is visible	0 to unknown (> 15 m)	geomorphic < 15 m, Benthic < 10 m
Depth source	n.a.	n.a.	satellite derived depth
Validation	35%	unknown	100%
Time frame	1999-2002	unknown	2018-2020
Spatial resolution	30 m	unknown	5 m
Number of classes	Geomorphic (>600)	Geomorphic (various)	Geomorphic (12) + Benthic (6)

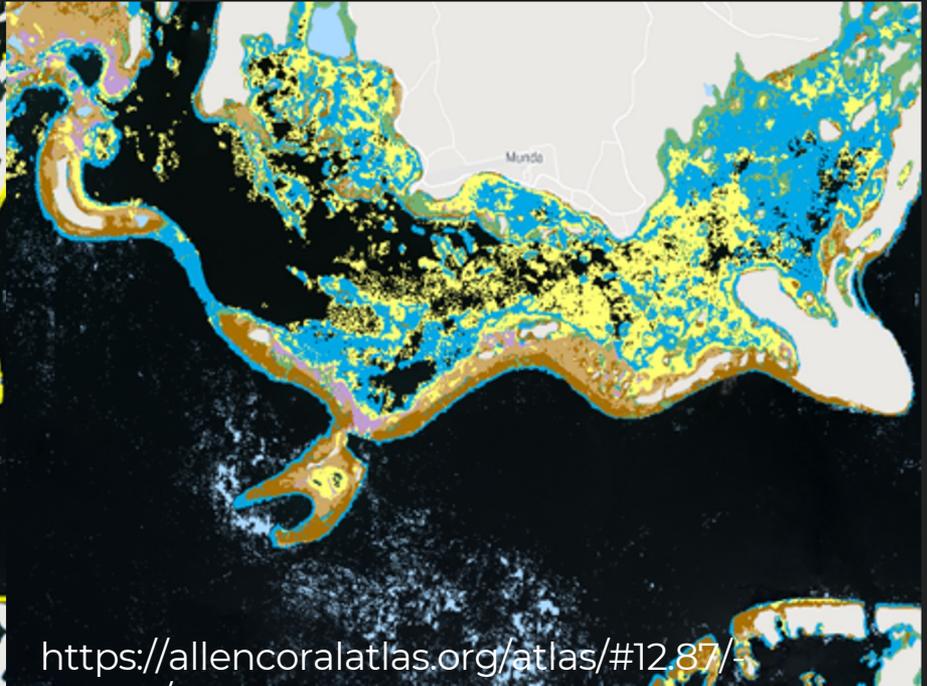
Thematic difference

Both UNEP and ACA provide reef outline, ACA also provide benthic detail

UNEP-WCMC 2018



ACA Benthic



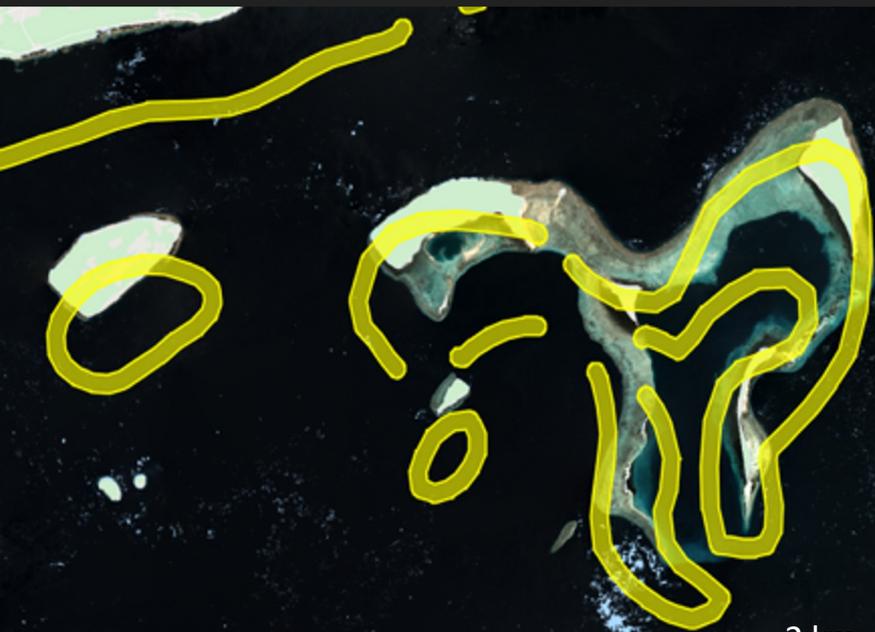
<https://allencoralatlas.org/atlas/#1287/>

Artificial Reef Outline

UNEP Reefs outlines based on conceptualised drawing

- every reef has the same width
- compared to ACA outlines are image based, as every pixel assigned a class.

UNEP 2018



ACA Benthic





COLLABORATION

COULD YOU ADD ATLAS HABITAT DATA
TO CT ATLAS?

How do you visualize/collect monitoring? How can we engage and support your monitoring and evaluation team?

Find Location

Mapped/Monitored Areas <

My Areas <

Mini Map

Legend

High Contrast Mode

Info/Help



Philippines Exclusive Economic Zone

Type: EEZ

More info

NOAA Coral Reef Watch

Toggle

Ocean Water Turbidity

New!

Toggle

Reef Habitat

Benthic Map

Toggle

Geomorphic Map

Toggle

Reef Satellite Imagery

Toggle

Reference Layers

Labels

Toggle

Marine Protected Areas

Toggle

Maritime Boundaries

Toggle

Base Map

Toggle

Find Location

Mapped/Monitored Areas <

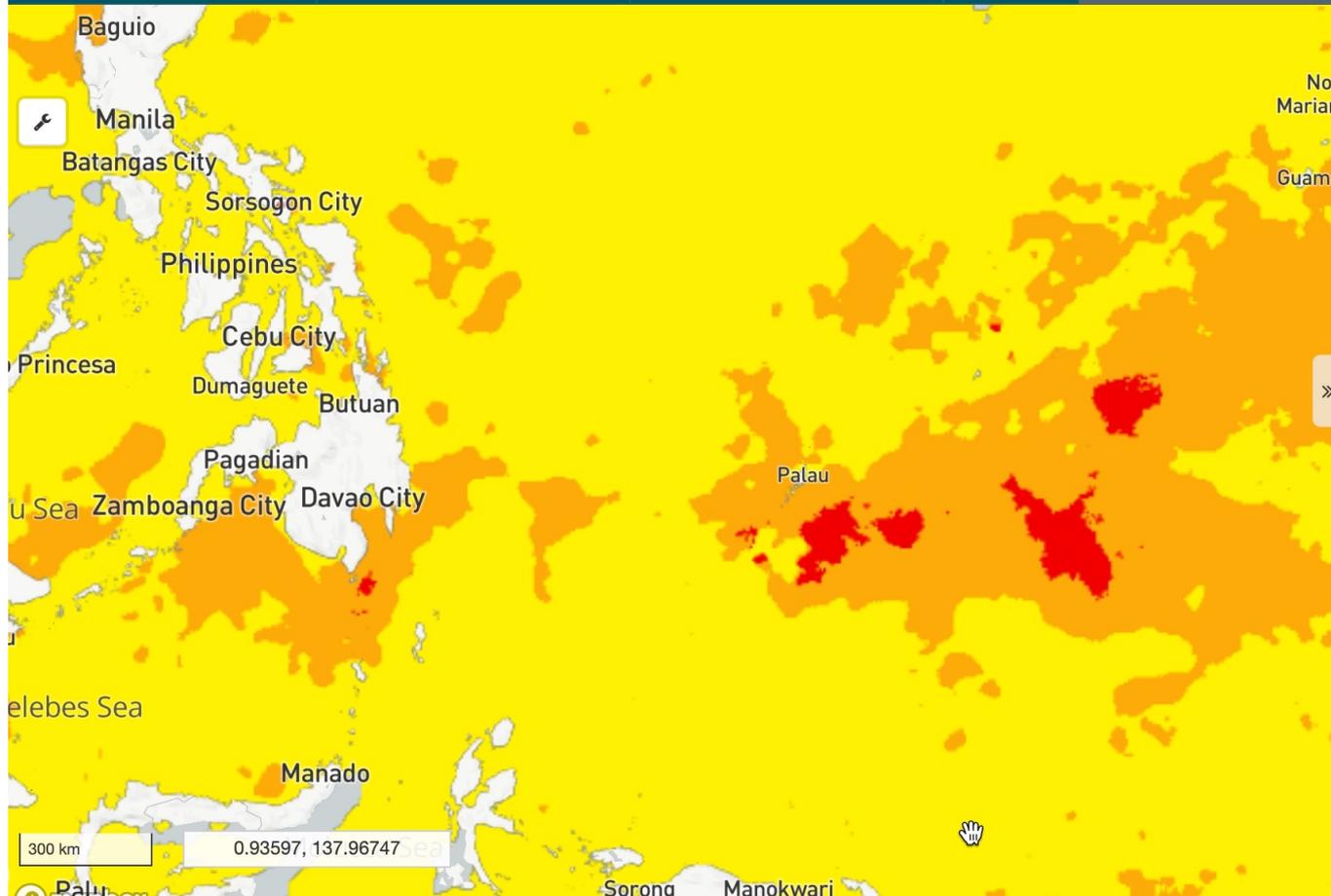
My Areas <

Mini Map

Legend

High Contrast Mode

Info/Help



Reef Threats

Coral Reef Bleaching *(Beta)* <

NOAA Coral Reef Watch <

Ocean Water Turbidity **New!** <

Reef Habitat

>> Benthic Map *i* <

Geomorphic Map *i* <

Reef Satellite Imagery <

Reference Layers

Labels

Marine Protected Areas <

Maritime Boundaries <



COLLABORATION

DO YOU HAVE MONITORING DATA YOU
COULD CONTRIBUTE?

*What method would you use? Bleaching and Turbidity validation?
Try ReefCloud a new database?*



Find Location

Mapped/Monitored Areas <

My Areas <

Mini Map

Legend

High Contrast Mode

Info/Help

Arabian Sea

Bay of Bengal



Legend



Turbidity

- Severe
- High
- Moderate
- Low
- No Data

Reef Threats

- Coral Reef Bleaching *(Beta)* <
- NOAA Coral Reef Watch <
- Ocean Water Turbidity **New!** <

Reef Habitat

- » Benthic Map <
- Geomorphic Map <
- Reef Satellite Imagery <

Reference Layers

- Labels
- Marine Protected Areas <
- Maritime Boundaries <

300 km

-2.60348, 82.97220



Allen Coral Atlas Impact



Allen Coral Atlas Impact

Guiding marine conservation efforts in the last 1 yr:

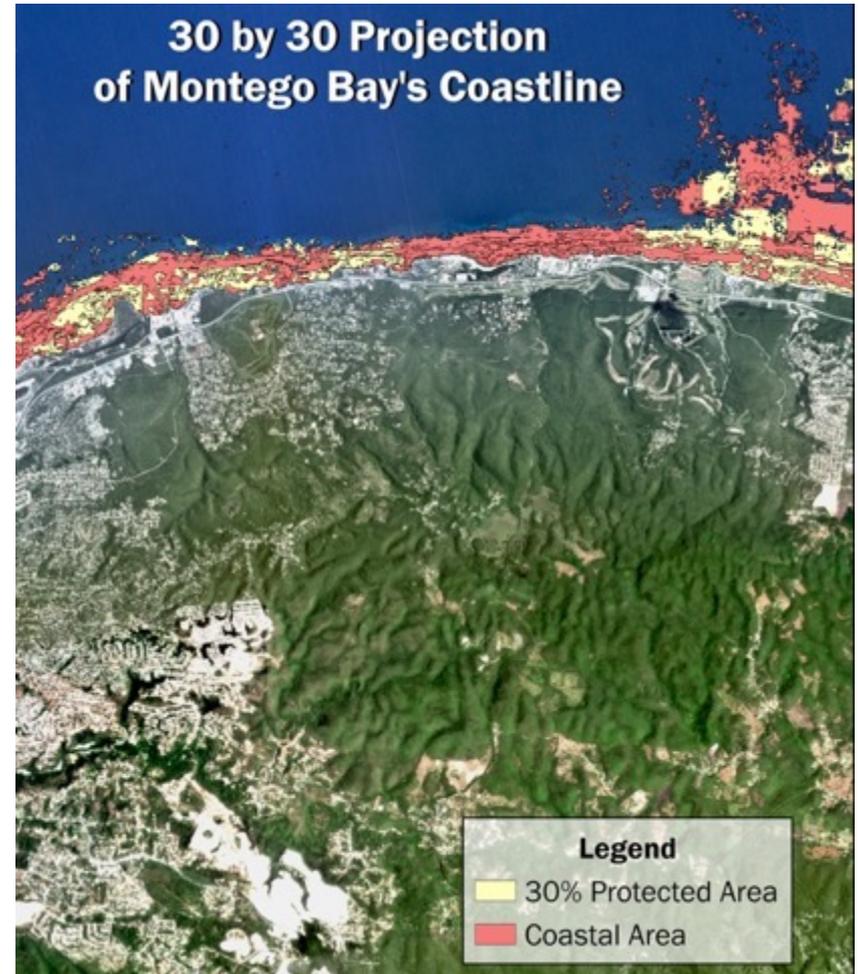
1. Marine Spatial Planning (MSP) = 71+
2. Ecological surveys = 69+
3. Coastal Resilience/risk assessment = 53+
4. Restoration = 18+
5. Ridge to Reef = 18+
6. Education = 6+

NATIONAL Monitor Progress

Monitor progress towards major goals
- such as the SDG's and 30x30.

MEASURE Indicator 14.5.1

- Protection of biologically important
areas within broader marine areas



REGIONAL Post-Disaster Assessment

1. Country wide analysis
2. Identify high risk areas
3. Monitoring locations
4. Review progress towards goals

MEASURE Indicator 14.2.1

By adding the ability to **remotely manage marine and coastal ecosystems**, especially coral reefs, by using the **dynamic bleaching and turbidity monitoring system**.



Government of Vanuatu

POST-DISASTER NEEDS ASSESSMENT

COVID-19 and TC HAROLD 2020, VANUATU

VOLUME A

The Allen Coral Atlas in Action!



Vanuatu: Ridge to Reef

"Which coral reef areas are vulnerable to run off?"



Planning for Change in Vanuatu: Post - Disast...

The government of Vanuatu recently used the Allen Coral Atlas maps with regards to Climate Change and Disasters; specifically...



Western Indian Ocean: Mapping Uncertainty ...

The Geological Society of Sweden is co-developing an environmental assessment tool for Marine Spatial planning (MSP...



Mozambique National Strategy and Action Pl...

The Allen Coral Atlas maps are used as base layers to start building upon countrywide strategy and action plans, such as...



Alacranes Reef, Mexico: Coral Reef Assessme...

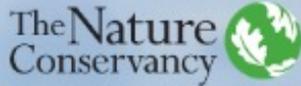
The Biodiversidad Marina de Yucatán, National Autonomous University of Mexico (UNAM), and the Student Workshop on...



Indonesia Ministry of Marine Affairs & Fisher...

Wen Wen (Allen Coral Atlas Regional Director) and the MMAF technical team are collaborating to use the Allen Coral system an...

Remote Sensing & Mapping for Coral Reef Conservation



139 Countries





COLLABORATION

1. LOCAL OR REGIONAL WORKSHOPS?
2. CONTRIBUTE MONITORING DATA?
3. APPROVE ALLEN CORAL ATLAS DATA ON CT ATLAS.

Opportunities to train a select group of people to teach and develop capacity in country ?

AllenCoralAtlas.org

bbambic@asu.com

arivera-sosa@coral.org

Scan for contact info



Missing Reefs due to Depth

ACA, not visible on map as too deep to automatically differentiate benthic
UNEP visible as potentially manually mapped

UNEP-WCMC 2018



ACA Benthic



Missing Reefs

Reef areas not mapped in UNEP or in ACA

UNEP-WCMC 2018

ACA Benthic

