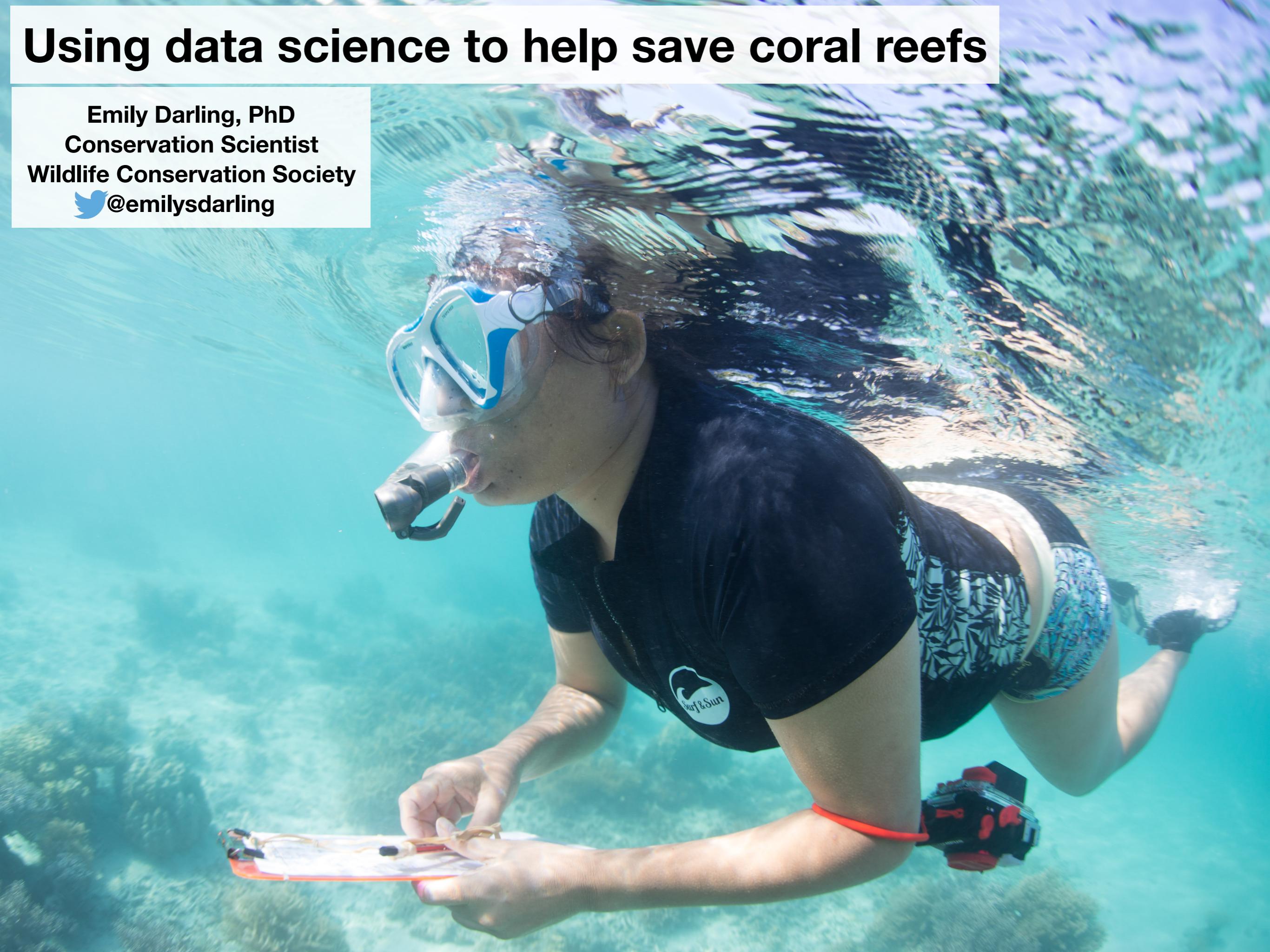
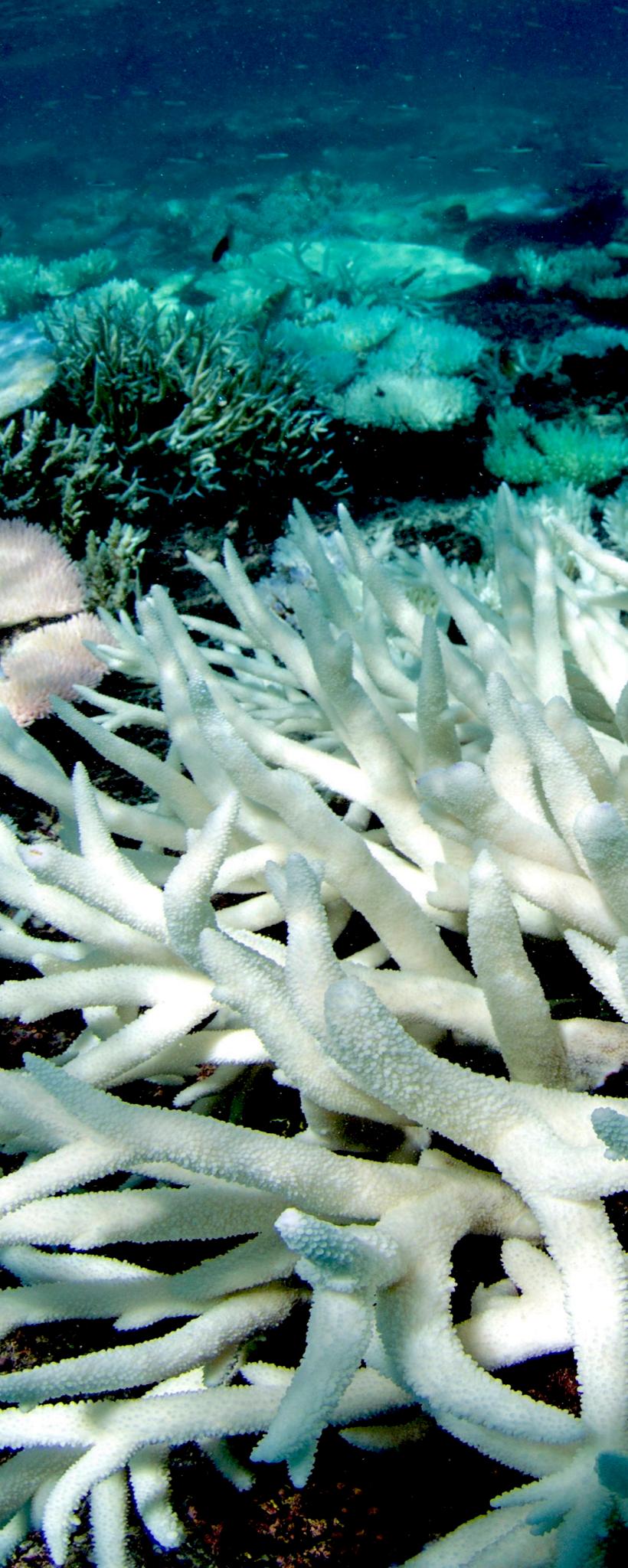
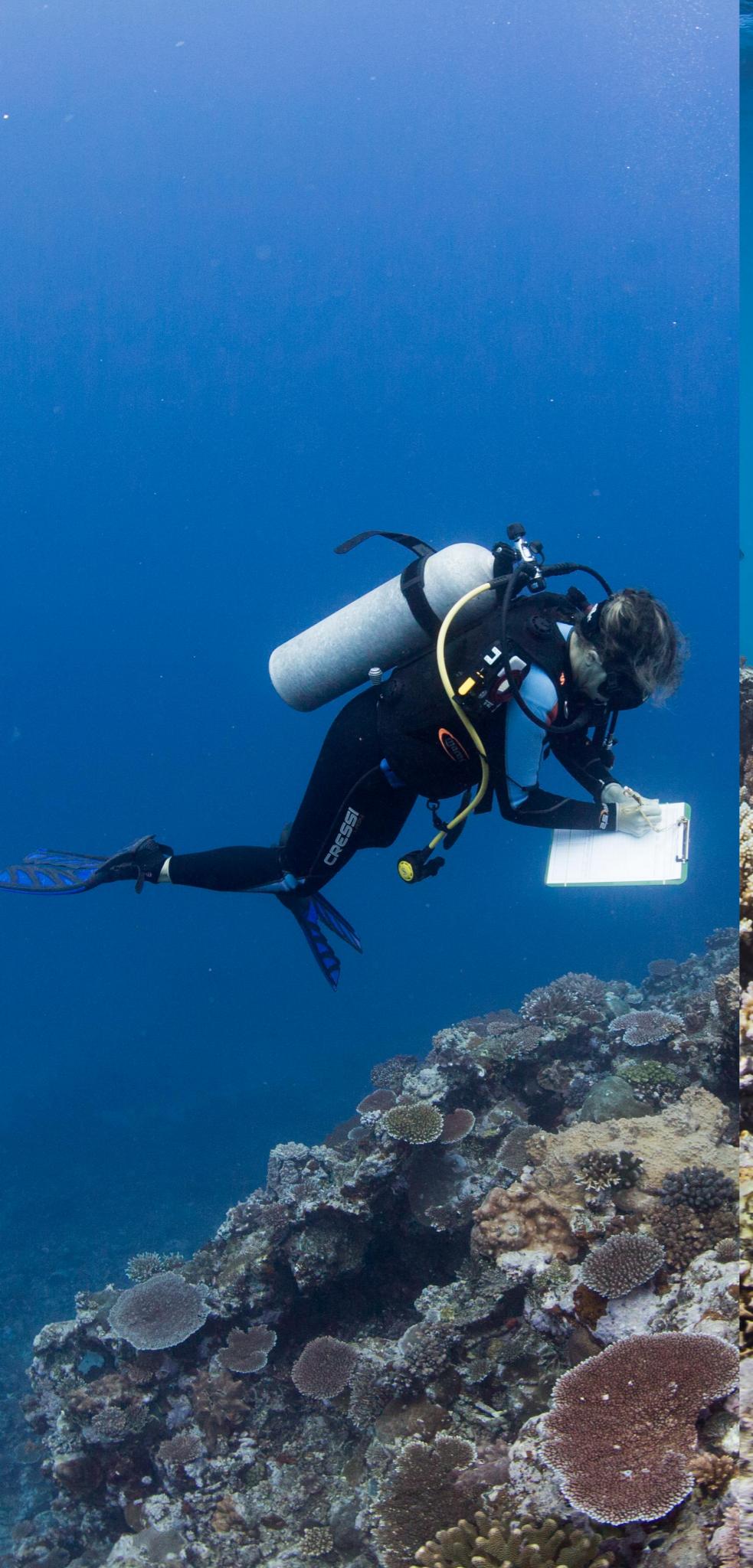
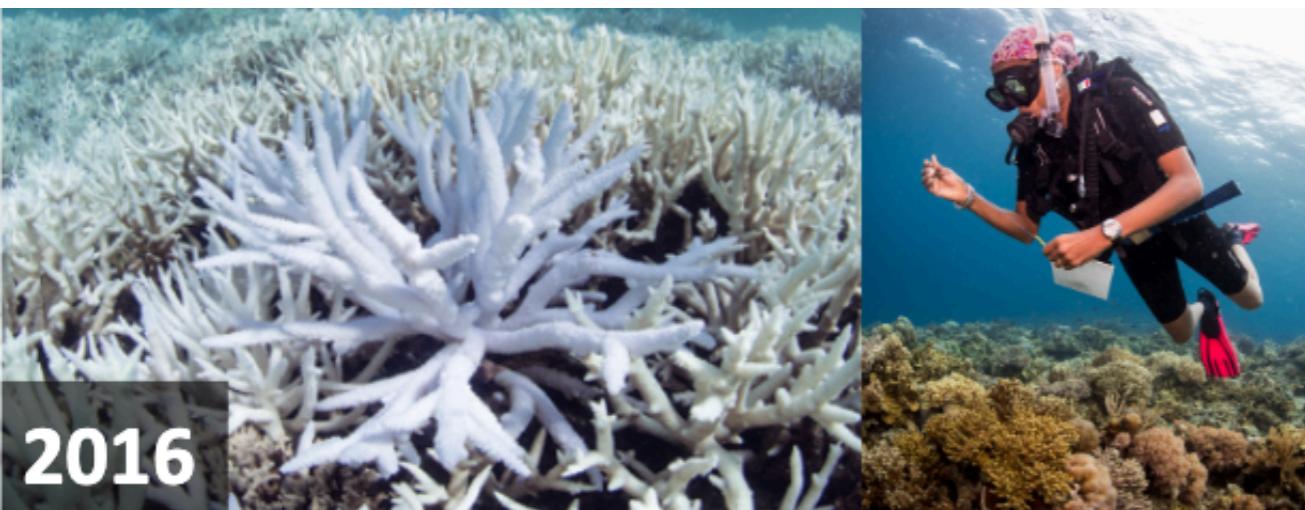


Using data science to help save coral reefs

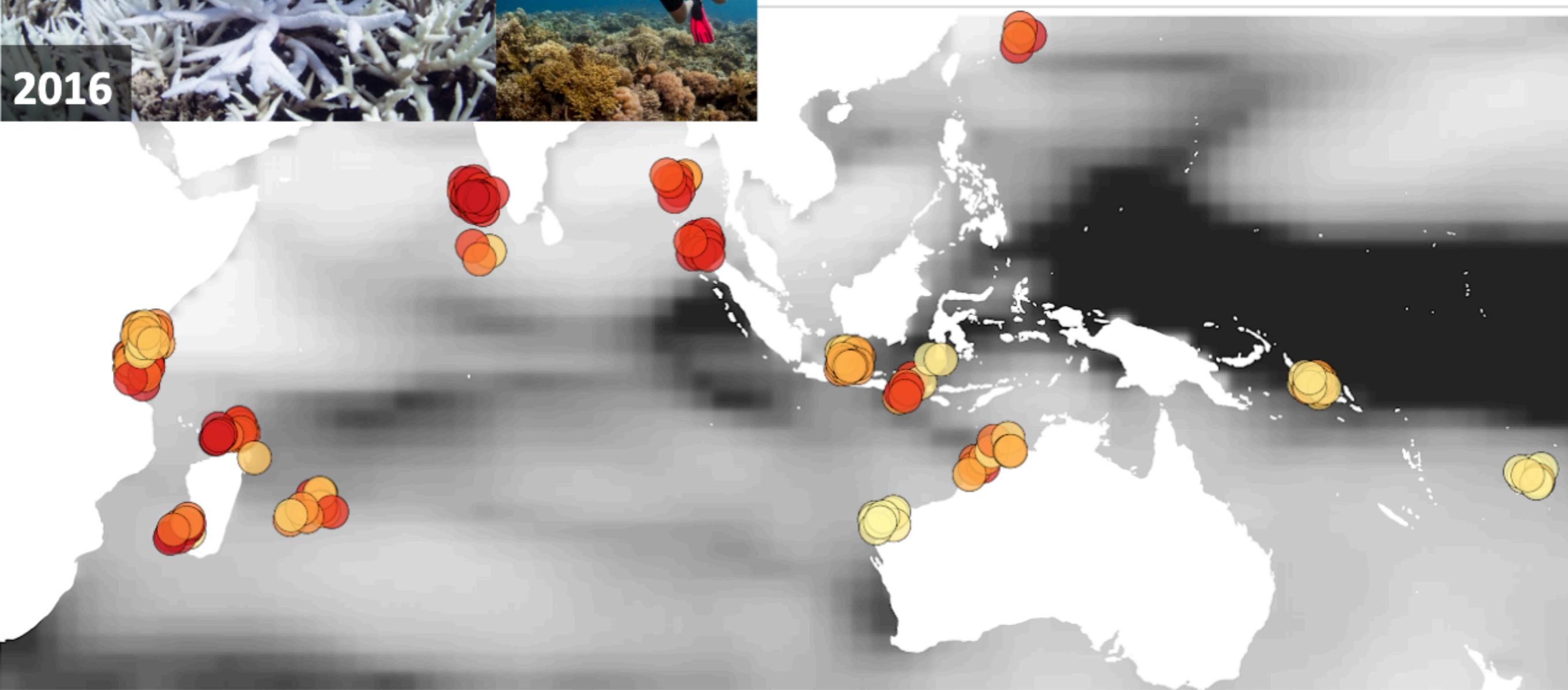
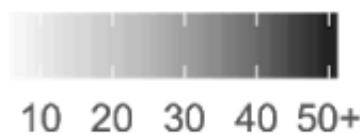
Emily Darling, PhD
Conservation Scientist
Wildlife Conservation Society
 @emilysdarling







Extreme
ocean heating
1982-2016



```
1 #this file calculates genus and site-level bleaching summaries
2 library(here)
3 source(here::here("R", "00-load-libraries.R"))
4 source(here::here("R", "01-data-source.R"))
5
6
7 #extract month from data
8 library(lubridate)
9 cols$date <- lubridate::ymd(cols$date)
10 summary(cols$date)
11
12 cols$month <- as.character(lubridate::month(cols$date))
13 table(cols$month)
14
15 cols <- cols %>%
16   mutate(month = fct_recode(month,
17     "April" = "4",
18     "May" = "5",
19     "June" = "6"))
20 table(cols$month)
21
22 #calculate site-level bleaching
23 cols.bleach <- cols %>%
24   dplyr::select(country, site, month, latitude, longitude,
25     exposure, depth, reef_type, reef_zone,
26     management_name, management_rules,
27     observer,
28     benthic_attribute, growth_form,
29     normal_count:recently_dead_count) %>%
30   group_by(country, site, month, latitude, longitude,
31     exposure, depth, reef_type, reef_zone,
32     management_name, management_rules,
33     observer,
34     benthic_attribute, growth_form) %>%
35   dplyr::summarize(total_cols = normal_count + pale_count +
36     x0_20_percent_bleached_count +
37     x20_50_percent_bleached_count +
38     x50_80_percent_bleached_count +
39     x80_100_percent_bleached_count +
40     recently_dead_count,
41     bleach_cols = total_cols - normal_count,
42     dead_cols = recently_dead_count,
43     perc_bleach = bleach_cols / total_cols * 100,
44     perc_dead = recently_dead_count / total_cols *100)
45
46 cols.bleach
```

```
04-fiji-bleaching-month.R x 01-data-source.R x 05-noaa-dhw-raster.R x Fig1-bleach-alerts-wi
Source on Save | 🔎 🖌️ | 📄

1 #this code makes a map of percent bleaching over DHWs for 2019
2
3 library(here)
4 source(here::here("R", "02-bleach-summaries.R"))
5 source(here::here("R", "03-bleaching-histograms.R"))
6
7 data
8 nrow(data)
9 table(data$bleach.class)
10
11 summary(data$latitude)
12 summary(data$longitude)
13
14 #Amelia code for maps
15 fiji <- map_data("world2Hires",
16                   xlim = c(250,300),
17                   ylim = c(50,90))
18 fiji
19
20 fiji.map <- ggplot() +
21   geom_polygon(data = fiji,
22                 aes(x= long, y= lat, group = group)) +
23   coord_equal() +
24   scale_x_continuous(limits = c(176.5,181.5)) +
25   geom_point(data = data,
26               aes(x = longitude, y = latitude, fill = bleach.class),
27               size = 5, shape = 21, alpha = 0.5,
28               colour = "black",
29               position = position_jitter(width = 0.005, height = 0.005)) +
30   scale_fill_manual(values = c("olivedrab3","yellow","orange","red"),
31                     "Bleached colonies",
32                     labels = c("<4%", "5-20%", "20-40%", ">40%")) +
33   theme_sleek(base_size = 18) +
34   #theme(legend.position = "none")
35   guides(fill = guide_legend	override.aes = list(alpha = 1))) +
36   xlab("Longitude") +
37   ylab("Latitude")
38
39 fiji.map
40 ggsave(here::here("outputs", "map-fiji-base.pdf"),
41         height = 10, width = 10)
```

<https://github.com/WCS-Marine/R-MERMAID>

WCS-Marine / R-MERMAID

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A repo of useful R code for MERMAID analyses and figures Edit

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esdarling README take 2	Latest commit c36e5e9 3 days ago
R	bleacing histogram and maps code
README_files	Rmd test README
sample-data	bleacing histogram and maps code
sample-outputs	bleacing histogram and maps code
.gitignore	bleacing histogram and maps code
R-MERMAID.Rproj	bleacing histogram and maps code
README.Rmd	README take 2
README.md	Rmd test README

README.md

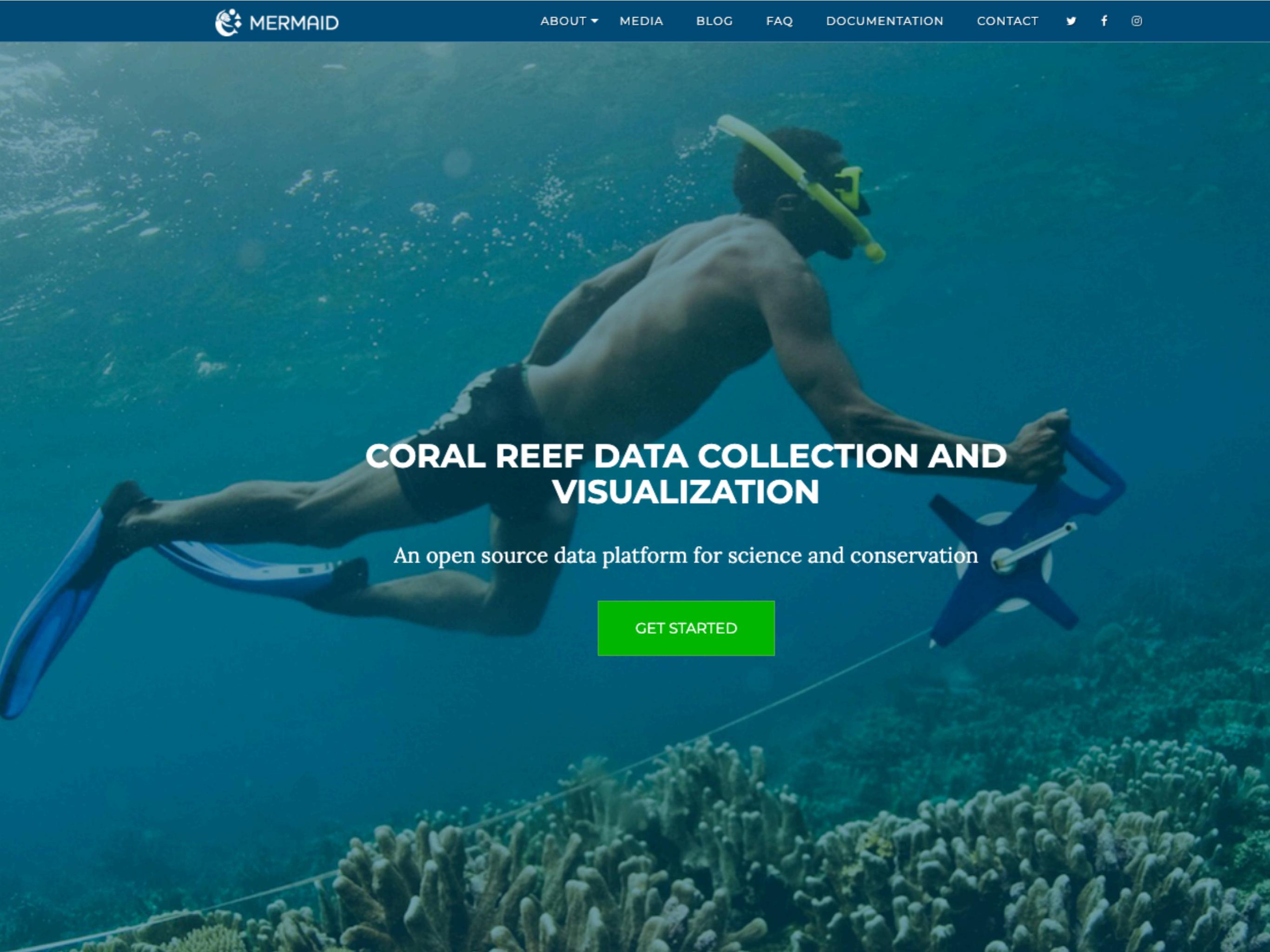
R-MERMAID

A repo of useful R code for MERMAID analyses and figures.

Contains a dataset of collected underwater observations from WCS and Manta Trust coral bleaching surveys from the Yasawas, Ra, Ovalau and Leleuvia in Fiji collected between April-June 2019. Learn more about the rapid coral bleaching assessment here, [linked phrase] (www.wcs.org/coral)



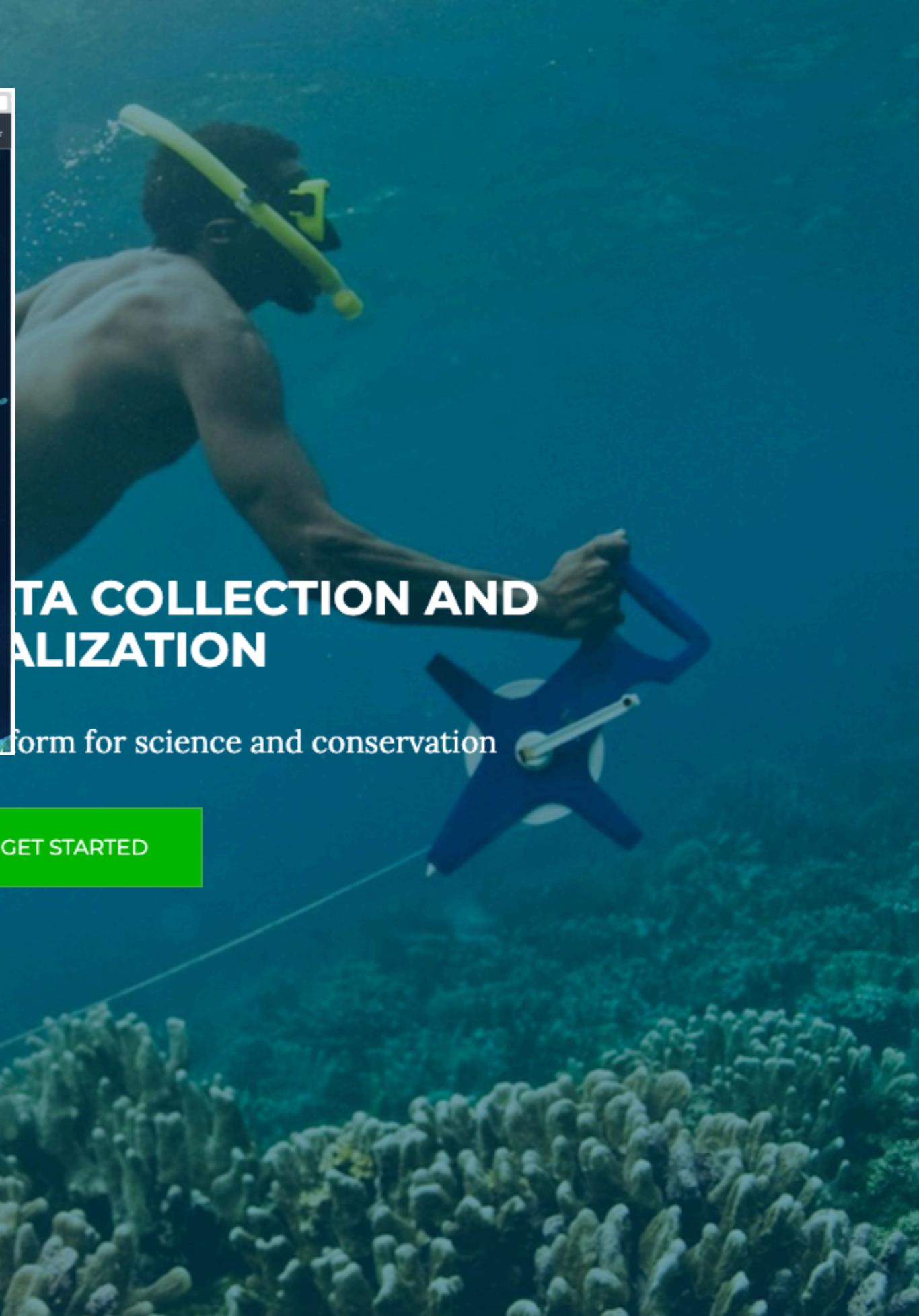
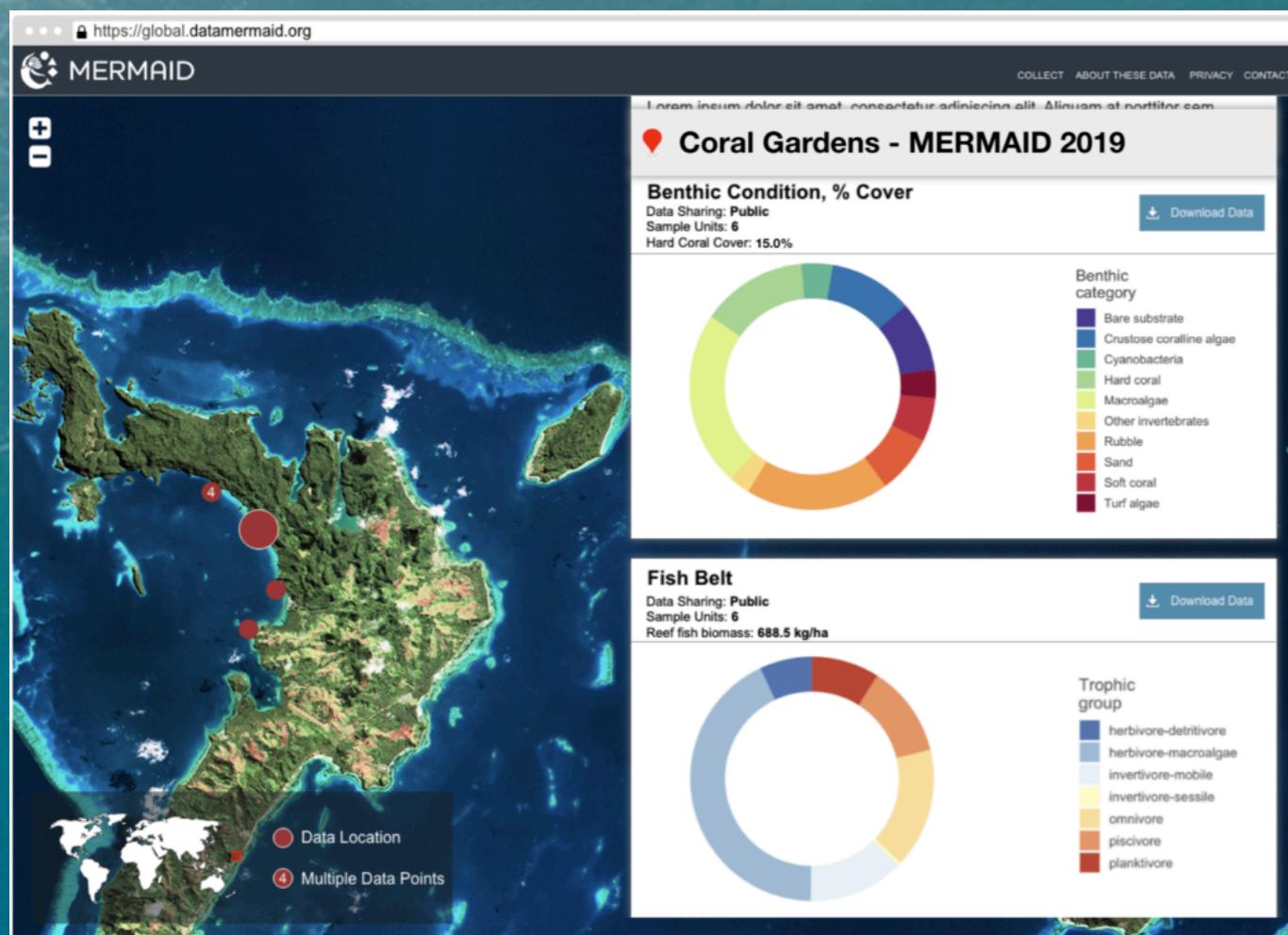
**Strengthen community and national
management for healthy coral reefs
to improve human wellbeing**

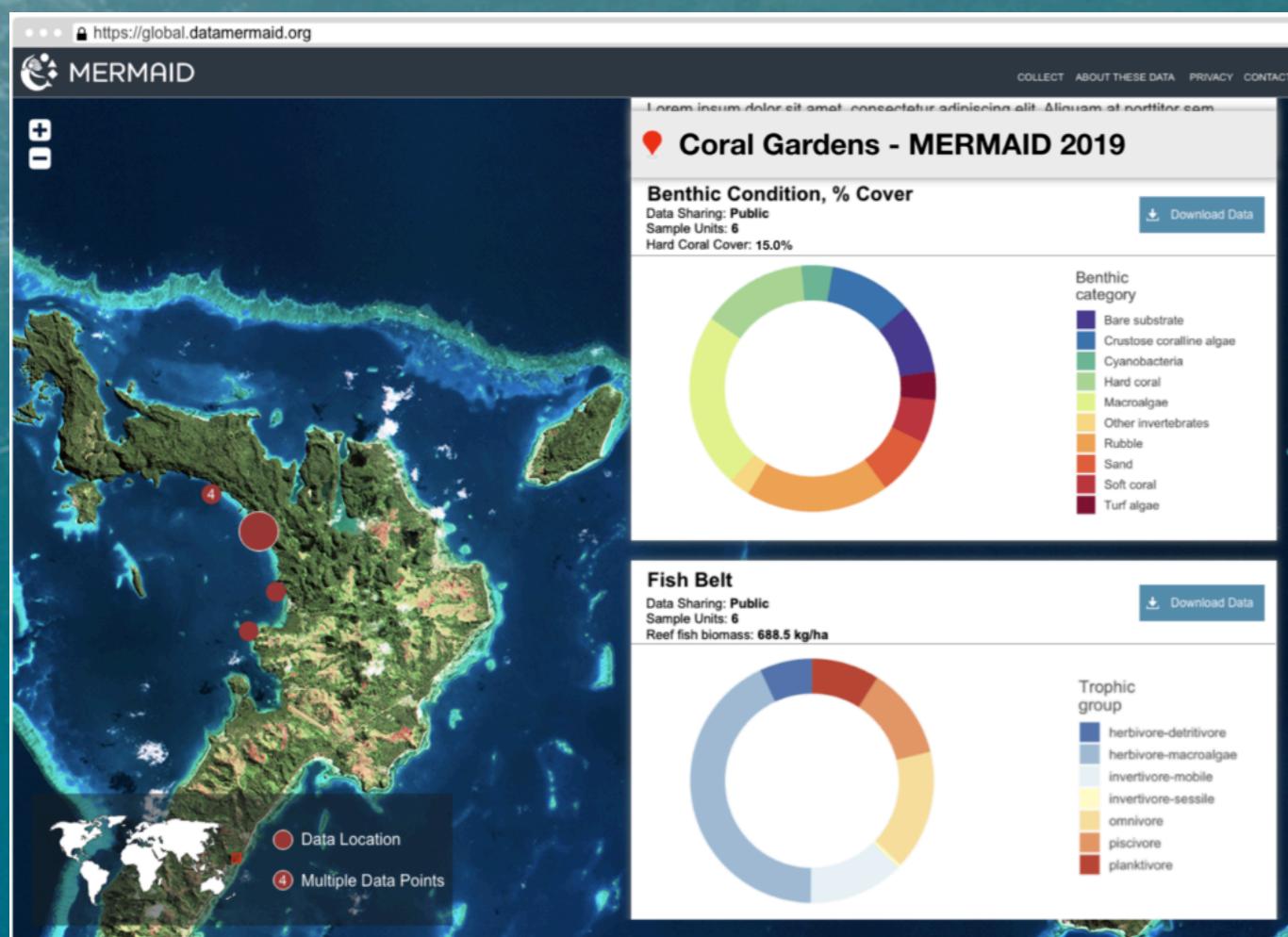
A photograph of a person snorkeling over a coral reef. The person is wearing a black wetsuit, a yellow snorkel, and blue flippers. They are looking down at the reef. The water is clear blue, and the reef is visible below.

CORAL REEF DATA COLLECTION AND VISUALIZATION

An open source data platform for science and conservation

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data-mermaid

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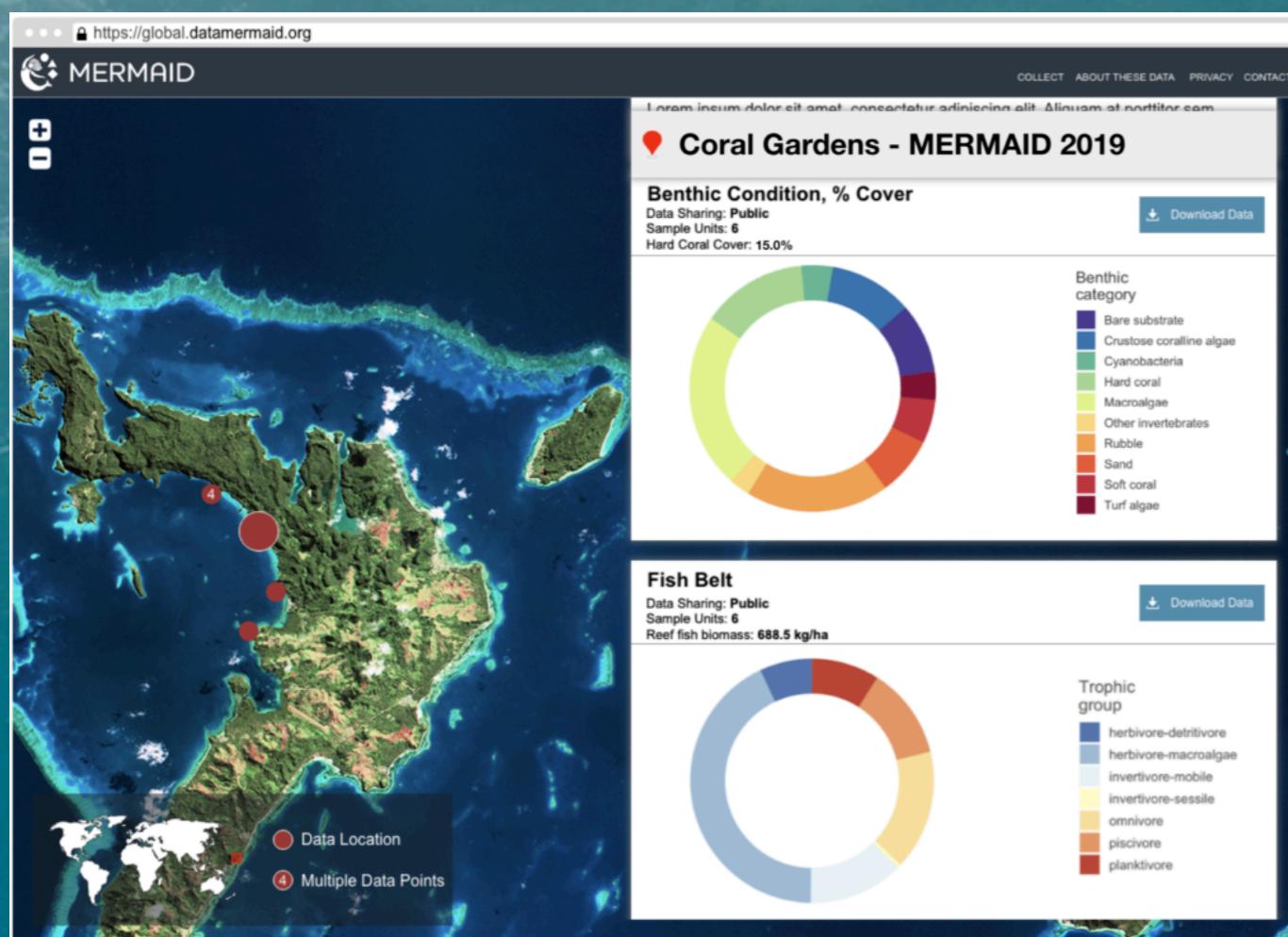
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