

Welcome!

Welcome to the MERMAID Documentation. Here we will walk you through how to use MERMAID.

MERMAID is an open-source application that collects and manages real-time coral reef health data, developed in partnership between the WCS, WWF, and Sparkgeo.

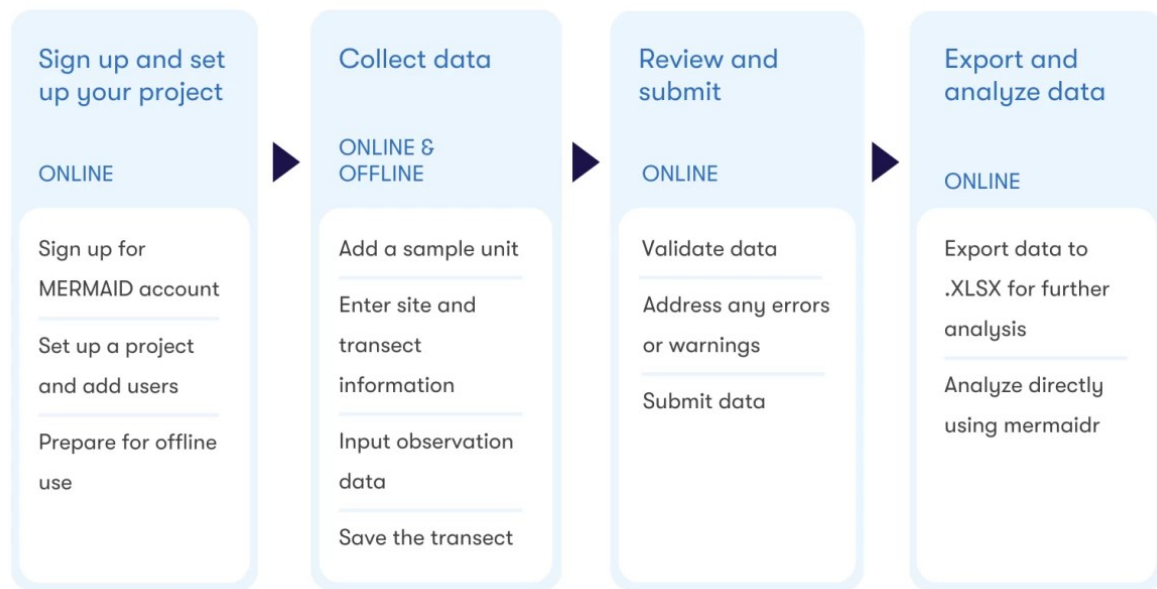
With MERMAID, scientists input their observations straight into the platform using the **Web app**. MERMAID does the job of tagging and sorting data, avoiding duplicates, standardizing scientific names and summarizing critical indicators.

We save you time so you can save coral reefs!

MERMAID joins you in the field with its on-line capabilities, but it stands apart from Excel or personal database apps like Access because it requires virtually zero post-entry data clean up!

Users can select reef fish and coral names from a standard list of taxa with only a few keystrokes; MERMAID will autocomplete the rest. Selecting names means saving time typing in species names or cleaning up typos of misspelled species names.

MERMAID also allows you to calculate reef fish biomass while you type, or see your total coral cover as soon as you have finished entering a transect. When you have finished collecting data, it can be exported to standard field reports (Excel) and used to create graphs or other reports. You can also analyze your data by accessing it directly from MERMAID using the **mermaidr package**.



The MERMAID workflow

The MERMAID workflow:

Sign up and set up a project

- a** Sign up for an account
- b** Set up a project and add users
- c** Prepare for o -line use

Collect data

- a** Select a transect type
- b** Enter site information
- c** Enter management regime
- d** Include benthic attributes and fish species
- e** Complete and save the transect

Review and submit

- a** Validate data

- b** Address errors and warnings

- c** Submit data

Export and analyze data

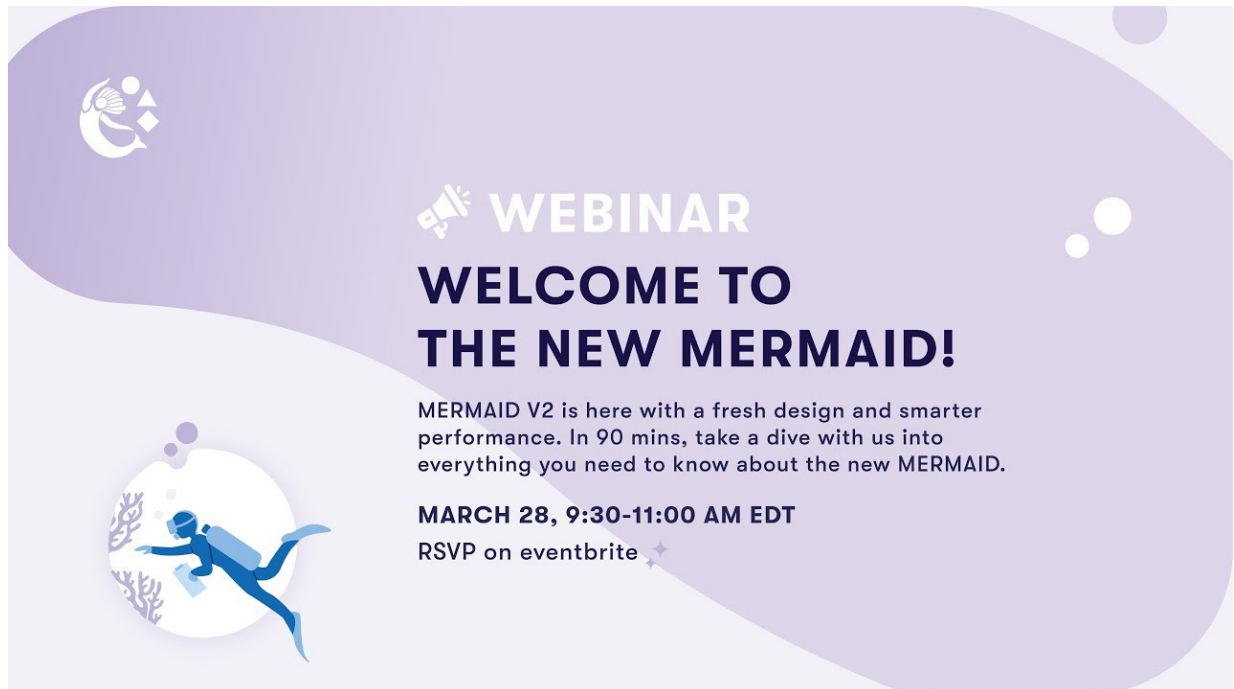
- a** Export to .XLSX for further analysis

- b** Analyze directly using **mermaidr**

Questions? You can reach out to us when online via the Contact link at the bottom of the app. An o -line (pdf) version of this documentation is also available in the same area.

A Deeper Dive into MERMAID V2

MERMAID has a fresh design and smarter performance. Dive into everything you need to know about the new MERMAID!



Take a tour of MERMAID version 2 in our latest webinar

The Projects Page

The Projects Page provides a complete summary of what is happening in each project: the number of **submitted and unsubmitted sample units**, the total number of **sites with data**, the number of **users added** to the project, and how the per-protocol **data sharing policies** have been set. **Click on each to go directly to the specific project page**; for example, you can access a project's Submitted data page by clicking **Submitted**. MERMAID Version 2 also added an **all-new notification area in the menu** (the "bell") that informs you of the latest updates from MERMAID and your projects. Close to the notification button, you can find the **Reference** button which you can access from any page. Now, you can download References in XLSX format and have all the benthic and fish data in one document. Each project also includes the **Copy** project and **O -line Ready** buttons from MERMAID Version 1.

MERMAID BETA Projects Reference Global Dashboard What's new

PROJECTS

Filter Projects By Name or Country Sort By Project Name

[New Project](#)

RHM Alor 2021					Copy	Offline Ready
Indonesia					Mon May 03 2021 13:45:57	
COLLECTING	SUBMITTED	SITES	USERS	DATA SHARING		
4	393	46	10	Fish belt: Private Benthic: Private Bleaching: Private		

RHM Derawan 2021					Copy	Offline Ready
Indonesia					Thu Jun 10 2021 22:05:31	
COLLECTING	SUBMITTED	SITES	USERS	DATA SHARING		
3	280	21	10	Fish belt: Private Benthic: Private Bleaching: Private		

You're **ONLINE**

The Project Page shows a summary of each project and provide easy access to certain pages

The Overview Page

As a data manager, you might want to see at a glance all the data that has been submitted as well as who to chase for unsubmitted data. MERMAID Version 2 understands you. It now has **Overview** pages that allow you to inspect the number of **submitted sample units** per method for each site as well as **who has not yet submitted** which sample units, and make sure that **sites are associated with the right management regimes**. Clicking on any sample unit number provides you with direct access to that sample unit. To make changes, the sample unit **must be moved** from the Submitted to the Collecting page. **Re-validation is required before submitting** the updated sample unit. This means no more unexpected site changes or other unintended errors.

		Submitted Transect Number					Transect Number / User
Site ▲	Method ▲	1	2	3	4	5	Amkieltiela
KE02	Benthic PIT	1	2	3	-	-	1, 2, 3
KE02	Fish Belt	1	2	3	4	5	1, 2, 3, 4, 5
KE03	Benthic PIT	1	2	3	-	-	1, 2, 3
KE03	Fish Belt	1	2	3	4	5	1, 2, 3, 4, 5
KE04	Benthic PIT	1	2	3	-	-	1, 2, 3
KE04	Fish Belt	1	2	3	4	5	1, 2, 3, 4, 5
KE05	Benthic PIT	1	2	3	-	-	1, 2, 3

The Overview Page showing submitted and unsubmitted data

The Collecting Page

The new Collecting Page is designed to allow users **to handle warnings and errors more easily**. It also shows a reminder of why a sample unit cannot be submitted, to help you address problems more quickly. Messages are easier to read and appear next to the field where the problem is. MERMAID Version 2 also deals with site and management regime duplications in a smarter way; Version 1 would check for duplication every time a site or management regime was saved, whereas **in Version 2, duplication is checked only with sample unit validation, and only against submitted sample units** -- a more recent and more relevant process. The **photo transect method** is now available in MERMAID Version 2 to store your **photo classification results**. On the Submitted page, the Export to XSLX button now produces a single file with data aggregated to sample unit and sample event levels as well as raw observations.

MERMAID BETA Projects Reference Global Dashboard What's new

DATA

Benthic PIT 4306 1

Collecting 2

Submitted

4306.1

ERROR Incorrect number of observations; expected 20

Errors or warnings are preventing you from submitting

Sample Event

Site * 4306

Management * Outside MPA [Control]

Sample Date * 25/01/2023

Transect

Transect Number * 1

Label

METADATA

Sites

Management Regimes

OVERVIEW

Observers and Transects

Management Regimes Overview

ADMIN

Project Info

Users You're **ONLINE**

The Benthic PIT collecting page with errors detected after validation.

The Users Page

The new Users page provides **more detailed information on users** in the project, for teams of any size. MERMAID Version 2 supports **filtering users by name or email address**. Admins can also **change roles, add and remove users without going to another page, and access the user's email addresses** for easy contact.

MERMAID BETA Projects Reference Global Dashboard What's new

DATA

Users

Filter this table by name or email Enter email address of user to add + Add User

Name ▲	Email ▲	Admin	Collector	Read-Only	Unsubmitted Sample Units	Remove From
Amkieltiela	@gmail.com	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	306 Transfer	
Dominic Andradi-Brown	@gmail.com	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	No sample units	
erdi lazuardi	@wwf.id	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	No sample units	

Showing 3 of 3 users Back Next

METADATA

Sites

Management Regimes

OVERVIEW

Users and Transects

Management Regimes Overview

ADMIN

Project Info

Users

Data Sharing

You're **ONLINE**

The Users Page where you can access all necessary information about the users within a project.

See our [MERMAID Version 2 announcement](#). If you have any questions or want to learn more about MERMAID Version 2, [contact us](#).

Getting started

SIGNING UP

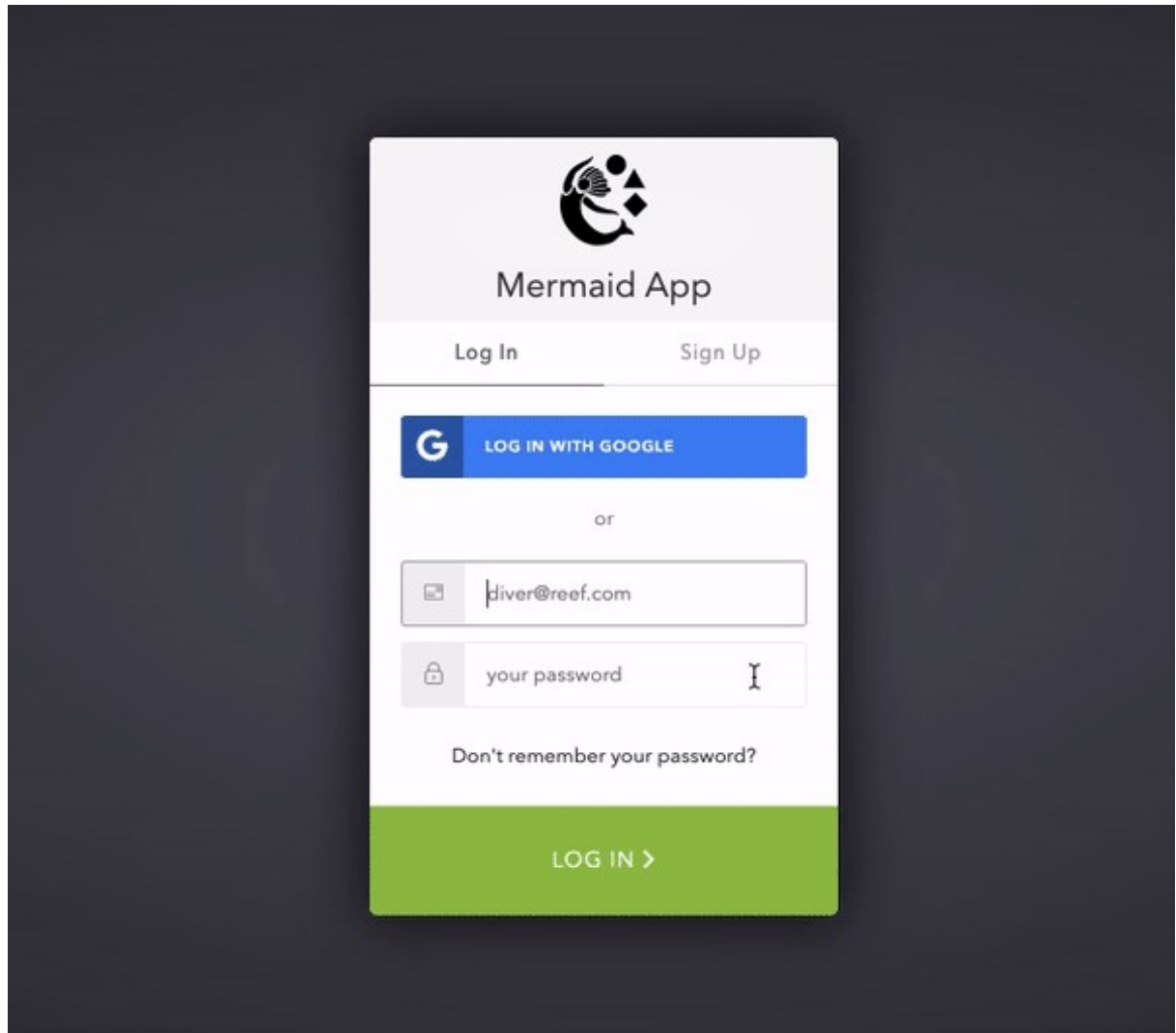
To use MERMAID, you need to sign up at <https://app.datamermaid.org>.

You can 'sign up with Google' to use an existing Gmail account and associated password, or enter a different email and create a password specific to MERMAID. Your account will be linked to your email.

Only users who have a MERMAID account can collect data on MERMAID. Emails not associated with MERMAID accounts can be specified by other users as Sample Unit observers; but without an account you cannot interact with the data.

MERMAID is only officially supported on Google Chrome, Firefox, and Edge browsers, and may not fully work with other browsers, like Explorer or Safari.

After signing up you will receive a confirmation email to verify your new account. You can access your profile information by clicking on the avatar in the upper right corner of any page. Here you can view your email and name, and change your MERMAID account name.



The Sign Up page where you create your MERMAID account

If you forget your unique password for MERMAID, click 'Don't remember your password?' on the login page to receive an email with a link to reset your password.

If you signed up for MERMAID using Google and forget your Gmail password, you must reset your password through Google.

SETTING UP A NEW PROJECT

A project consists of a set of observations collected in sample units (transect/quadrat/etc.) surveyed at particular sites, on particular dates, associated with management regimes. All data, data sharing, and user access in MERMAID is

organized by project. It is up to you to decide how to organize your observations; many users define a project as containing the data from a single expedition.

A new project can only be created while online. To create, click the red 'New Project' button, enter a project name, then click "**Create Project**" to complete your new MERMAID project. A name is required for every new project. All other information can be added using "**Project Info**" in the lefthand menu.

After a project is created, add users, sites, and management regimes while online.

The screenshot displays the MERMAID BETA web application. The top navigation bar contains links for 'Projects', 'Reference', 'Global Dashboard', and 'What's new'. A 'New Project' button is located in the top right. The main section is titled 'PROJECTS' and includes a search filter 'Filter Projects By Name or Country' and a 'Sort By' dropdown set to 'Project Name'. Two project cards are visible: 'a2' (Canada, Fiji) and 'Another Test_Tiela' (Indonesia). Each card shows a 'Copy' button, an 'Offline Ready' checkbox, and a timestamp. Below the header, each card has a table with columns: COLLECTING, SUBMITTED, SITES, USERS, and DATA SHARING. The 'a2' project shows 6 collecting, 0 submitted, 9 sites, and 9 users. The 'Another Test_Tiela' project shows 0 collecting, 0 submitted, 3 sites, and 2 users. The 'DATA SHARING' section for both projects lists 'Fish belt: Public Summary', 'Benthic: Public Summary', and 'Bleaching: Public Summary'. At the bottom, a status bar indicates 'You're ONLINE' and 'Mermaid Survey'.

Create a new project by clicking the 'New Project' button and typing the project name

1. Add Users:

Enter the email addresses for users involved in the project and select their roles.

Users should be signed up for a MERMAID account before they can be added a project. In MERMAID Version 2, you can add an email that has not yet been associated with an account, but that project user's name will appear as '(pending user)' and they will not be able to access MERMAID until they associate that email with an account.

The screenshot shows the 'Project Info' page in the MERMAID BETA application. The top navigation bar includes 'Projects', 'Reference', 'Global Dashboard', and 'What's new'. The left sidebar has sections for 'DATA' (Collecting, Submitted), 'METADATA' (Sites, Management Regimes), 'OVERVIEW' (Observers and Transects, Management Regimes Overview), and 'ADMIN' (Project Info, Users, Data Sharing). The main content area is titled 'Project Info' and contains a 'Project Name' field with the value 'Mermaid Reef Survey', a 'Notes' text area, and an 'Organizations' search field. A 'Saved' button is in the top right. The bottom status bar shows 'You're ONLINE' and links for 'Help (PDF)', 'Terms', 'Contact', and 'Credits develop'.

The User Page where you can add, remove, or change user's role in a project

The project creator is automatically the administrator ('admin') of the project

Other users will default to the collector role when added and can be changed to admin or read-only by selecting the appropriate role from the available options. Additional users can be added or deleted by the administrator after a project is created.

The scope of each role is as follows:

- **Read-Only:** user can only view, export, and analyze data in the analysis tools, but cannot collect new observations.
 - i.e. a project manager who is in charge of writing reports or analyses but is not collecting data in the field
- **Collector:** user can view, export, and analyze data, and collect new observations. Once a transect is submitted, the user can no longer edit or delete observations.
 - i.e. a member of the project team who is tasked with collecting data
- **Admin:** user has all Collector privileges, and can additionally change project information and data sharing, add and remove project users, transfer unsubmitted sample units between project users, and un-submit sample units for further editing.

- i.e. typically one person designated as the lead of the project

If a user must leave a project or reaches the end of their position, their data can be transferred to other users within a project. This can be done within a project through the **"Users"** tab. Simply select 'Transfer' for the user that will be removed from the project, then indicate the user from the project to whom you would like to transfer the unsubmitted sample units. Users can also be removed from a project on this page. **If a user still has unsubmitted sample units on their "collecting" page, be sure to transfer records prior to removing them from the project.**

MERMAID BETA Projects Reference Global Dashboard What's new

Mermaid Reef Survey

DATA

- Collecting (2)
- Submitted

Filter this table by method, site, management, or observer

Method	Site	Management Regime	Sample Unit #	Size	Depth (m)	Sample Date	Observers
Benthic PIT	1208	NTZ	1	-			-
Fish Belt	1208	Control	1	-		February 28, 2023	-

+ Add Sample Unit

Showing 2 of 2 sample units

Back Next

ADMIN

- Project Info
- Users
- Data Sharing

You're ONLINE

Transfer unsubmitted sample unit(s) to other admin or collector on the User Page

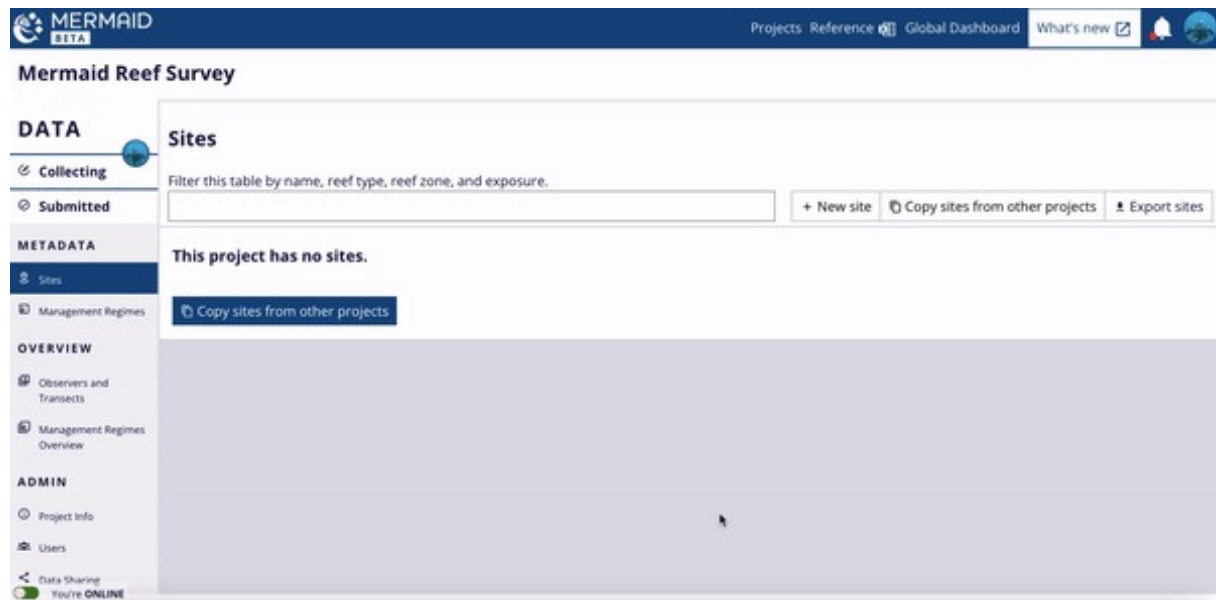
2. Add Sites:

Adding sites to a project is done after the project has been created, by selecting the **"Sites"** item under **"METADATA"** in the lefthand menu within a project. Once on the sites page, there are two ways to add a site to a project:

Create a new site using the **"+ New site"** button at the top right of the page, fill in the details and click the 'Save' button on the top right of the page.

Choose from sites that are already in the MERMAID system using the **"Copy sites from other projects"** button next to the create new site button. These may be sites that you or your organization are monitoring and have used before in previous surveys. The search bar allows you to filter the list by site name,

project name, or country. Click the check box next to any site you would like to add to your project, then click the **“Copy selected sites to project”** button at the bottom of the dialog. A map at the bottom of the dialog also displays where the site is located with a red dot.



Adding site(s) to a project by copying from existing sites in MERMAID

3. Add Management Regime:

A **management regime** categorizes the regulations and restrictions placed on an area in which a survey site is located, on the date of the survey. These may be management regimes for sites that you or your organization are monitoring or have used in previous surveys. To add management regimes, navigate to **"Management Regimes"** in the lefthand menu within a project.

If you are surveying sites with a new management regime, or if your site's management regime has changed, it must be added after creating your new project.

There are two ways to add management regimes to a project:

Create a new management regimes using the **" + New MR"** button at the top right of the page, fill in all the details, and then click 'Save' on the top right of the page.

Choose from existing management regimes in the MERMAID system using **"Copy MRs from other projects"** can save time by selecting and adding previous management regimes to your project here. The 'Filter' bar allows you to search the list by management name, project name, or year. Click the check box next to any management type you would like to add to your project, then click the **"Copy selected MRs to project"** button at the bottom of the dialog.

Method	Site	Management Regime	Sample Unit #	Size	Depth (m)	Sample Date	Observers
Benthic PIT	1208			1	-		-
Fish Belt	1208			1	-	February 28, 2023	-

Adding management regime(s) by selecting from existing management regimes in MERMAID

4. Data Sharing:

MERMAID is committed to working collectively as a community of researchers and reef managers to use the power of data to make faster, better decisions. Coral reef monitoring data is collected with the intent of advancing coral reef science and improving management. We recognize that you collect data and your sense of ownership. While not required, we hope you choose to make your data available to fuel new discoveries and inform conservation solutions.

Choosing a data policy for your project determines how much of your project's data can be shared with other users to facilitate global collaboration and understanding

of coral reef health via future global dashboard features in MERMAID. It can be chosen independently for different survey methods, so that fish and benthic data can have different levels of sharing. Your data policy level can be changed at any time after creating a project.

The three policy levels are:

- **Public summary** – Collected observations are private, but site-level summary statistics are public, along with metadata for the project, protocol, and site. This option is the default.
- **Public** – All collected observations are public.
- **Private** – Collected observations and site-level summary statistics are private, but metadata for project, protocol, and site, including site location and type and count of sample unit at each site, are public.

If you are creating a project to practice using MERMAID or train others, you can indicate this with the 'This is a test project' checkbox at the bottom of the page. Data added for a test project will be omitted from all public reporting.

The screenshot shows the MERMAID web application interface. The top navigation bar includes the MERMAID logo, a 'Projects' link, a 'Reference' link, a 'Global Dashboard' link, and a 'What's new' link. The main header is 'Mermaid Reef Survey'. The left sidebar contains a 'DATA' section with 'Collecting' and 'Submitted' options, a 'METADATA' section with 'Sites' and 'Management Regimes' options, an 'OVERVIEW' section with 'Observers and Transects' and 'Management Regimes Overview' options, and an 'ADMIN' section with 'Project Info', 'Users', and 'Data Sharing' options. The main content area is titled 'Management Regimes' and features a filter input field and buttons for 'New MR', 'Copy MRs from other projects', and 'Export MRs'. Below this is a table with the following columns: Management Regime Name, Secondary Name, Year Est., Compliance, Open Access, Access Restrictions, Periodic Closure, Size Limits, Gear Restrictions, Species Restrictions, and No Take. The table contains three rows of data. At the bottom of the table, it says 'Showing 3 of 3 management regimes' and has 'Back' and 'Next' buttons. The footer of the page shows 'You're ONLINE' and links for 'Help/FAQ', 'Terms', 'Contact', and 'Credits/Privacy'.

Management Regime Name	Secondary Name	Year Est.	Compliance	Open Access	Access Restrictions	Periodic Closure	Size Limits	Gear Restrictions	Species Restrictions	No Take
Control	Outside MPA			✓						
NTZ	Intd									✓
Use	Traditional									

Set your data sharing options or assign a project as a test project on the Data Sharing Page

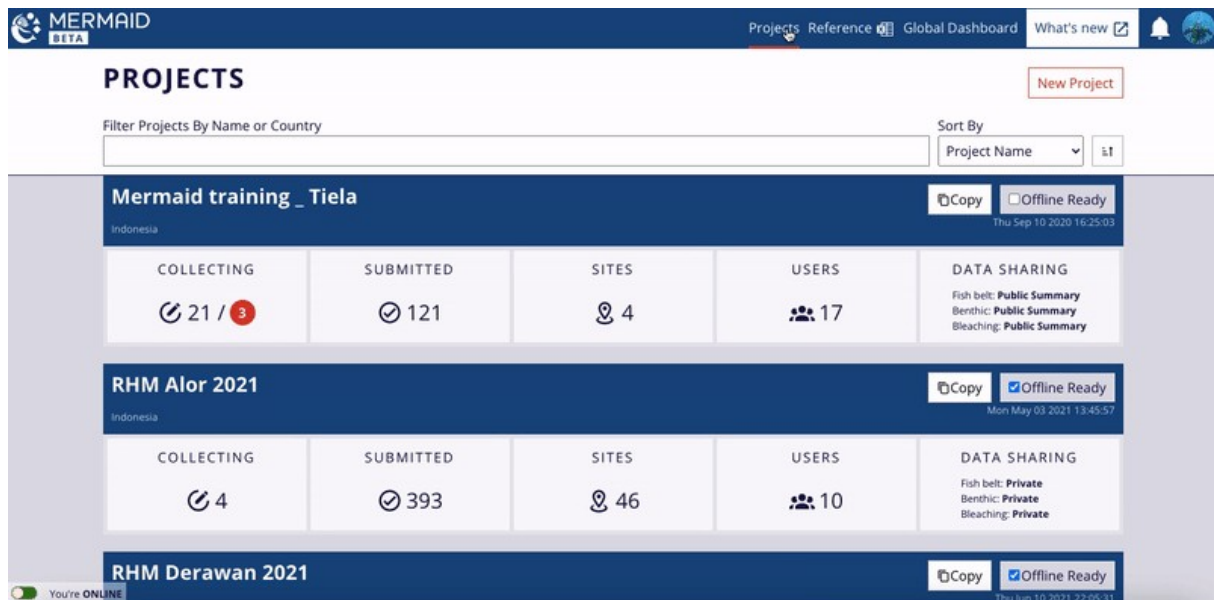
Now your project is ready to be used!

THE PROJECTS PAGE

The Projects page lists all the MERMAID projects of which you are a part, in any role (admin, collector, or read-only).

Click the top-left “MERMAID” icon or “Projects” in the top navigation bar of any page to go to your main Projects page.

Project details can only be edited while online.



The screenshot shows the MERMAID web interface. At the top, there's a navigation bar with the MERMAID logo, a 'Projects' tab, and other links like 'Reference', 'Global Dashboard', and 'What's new'. Below the navigation bar, the main heading is 'PROJECTS'. There's a search bar labeled 'Filter Projects By Name or Country' and a 'Sort By' dropdown menu set to 'Project Name'. A 'New Project' button is in the top right. The main content area displays three project cards:

- Mermaid training _ Tiela** (Indonesia):
 - Collecting: 21 / 3
 - Submitted: 121
 - Sites: 4
 - Users: 17
 - Data Sharing: Fish belt: Public Summary, Benthic: Public Summary, Bleaching: Public Summary
- RHM Alor 2021** (Indonesia):
 - Collecting: 4
 - Submitted: 393
 - Sites: 46
 - Users: 10
 - Data Sharing: Fish belt: Private, Benthic: Private, Bleaching: Private
- RHM Derawan 2021**:
 - Collecting: (not visible)
 - Submitted: (not visible)
 - Sites: (not visible)
 - Users: (not visible)
 - Data Sharing: (not visible)

Each card has a 'Copy' button and an 'Offline Ready' status indicator. The bottom of the page shows a status bar indicating 'You're ONLINE'.

You can access common project pages directly by clicking each item under each project. For example, if you click **COLLECTING**, you will be directed to that project's **Collecting** page. In this way, the Projects page provides easy access to directly start entering data, review submitted sample units, manage your sites, remove or add additional users, and change your data sharing settings for each project.

Use the filter bar to search the projects by name or country. You can also download a Reference xlsx file containing the fish and benthic attributes used in MERMAID, go

to the Global Dashboard, view the What's New page, and check updates using the notification (bell) icon.

PREPARING FOR OFFLINE USE

Before heading to the field, there are a few steps that must be followed to ensure you are able to enter data ~~one~~.

Be sure to follow each step carefully prior to your expedition **while connected to the internet**:

All project members create accounts

A project admin creates the project

The project admin must add all other users to the project. Optionally, copy or add sites and management regimes before going to the field.

Ensure that the 'One Ready' button to the right of each project in the project list that you will use has a checked sign. If it is not checked, click the 'One Ready' button to make sure data is available ~~on~~

Test offline access by clicking the 'You're ONLINE' toggle on the bottom left of all pages so that it reads 'You're OFFLINE', turning off your Wi-Fi, restarting Chrome, and entering test data into your project.

Ensure that you and all other project members are logged in to MERMAID and can access the project with all the latest sites and management regimes, then toggle the 'You're ONLINE' button to 'You're OFFLINE'. **Do not sign out of your MERMAID account.** Now your project is ready to be used and it is safe to turn off your computer.

GLOBAL FUND FOR CORAL REEFS

MERMAID supports the [Global Fund for Coral Reefs](#), a blended finance instrument to mobilize action and resources to protect and restore coral reef ecosystems. To set up

a GFCR project, simply add 'Global Fund for Coral Reefs' as an organization on your project's 'Project info' page. Projects support multiple organizations.

The screenshot shows the 'Project Info' page in the MERMAID BETA application. The page has a dark blue header with the MERMAID BETA logo and navigation links: Projects, Reference, Global Dashboard, and What's new. A left sidebar contains a 'DATA' section with 'Collecting' and 'Submitted' tabs, and an 'ADMIN' section with 'Project Info', 'Users', and 'Data Sharing' links. The main content area is titled 'Project Info' and contains three input fields: 'Project Name' (filled with 'Mermaid Reef Survey'), 'Notes' (filled with 'Sustainable Reef Investments'), and 'Organizations' (empty with a placeholder 'Type to search for an organization.'). A 'Save' button is in the top right corner. The footer shows 'You're ONLINE' and links for Help, PDF, Terms, Contact, Credits, and develop.

To view all projects tagged with Global Fund for Coral Reefs:

1. Go to the **MERMAID dashboard**
2. Select the 'filter' icon on the left toolbar
3. Filter organization to 'Global Fund for Coral Reefs'



Summaries are dynamic

Use the map and the filters to explore the data in your areas of interest.

20

Years

35%

Avg Coral Coverage

Collecting data

PROCESS AND DEFINITIONS

The data collection process

All information entered in MERMAID goes through validation before becoming live, scientifically valid data. When entering information from your dive sheets, whether online or offline, you work with transects and quadrats that are **only visible to you**, in the "**Collecting**" area of a project.

When you are online and ready to commit your observations, you **validate** each sample unit individually, and once all warnings and errors are addressed, submit it. Only then does the sample unit become visible to all project members in the "**Submitted**" area of the project. It is also part of all exported xlsx files, and available via authenticated **mermaidr** access. If the project's **data sharing** policy for that sample unit is not "private", the sample unit will also be available to non-project members, accessible via the MERMAID dashboard.

Definitions

- **Site:** A place, defined per-project as a unique set of latitude and longitude coordinates with a name and other attributes, where data is collected
- **Management Regime:** A set of rules ~~exit~~ at the time of data collection governing coral reef resources, with a name and other optional attributes.
- **Sample event:** An episode of data collection occurring at a Site on a date, with a Management Regime in place. The unique combination of Site, date, and Management Regime defines a Sample Event, which is used for the aggregated calculation of sample unit-level survey results.
- **Sample unit:** A group of observations collected as part of a particular survey protocol, at a given place on a given date (sample event). Because many survey protocols define a transect, "sample unit" is often used interchangeably with "transect" but is more general, including, for example, collections of bleaching quadrats.

- **Observation:** an individual measurement of an observable phenomenon collected as part of a sample unit, for example a benthic attribute at a point along a benthic Point Intercept Transect.
- **Validation:** The MERMAID online process all sample units must undergo before becoming scientifically valid data.
- **Error:** a validation issue prohibiting submission because it violates fundamental survey protocol definitions; for example, a transect cannot be submitted without a defined length.
- **Warning:** a validation issue that flags an unusual value, such as a fish size greater than previously recorded. Warnings can be addressed by changing the relevant value or by indicating that the warning should be ignored.

THE COLLECTING PAGE

The 'Collecting' page is where you can add new sample unit observations and view other observations that you have already collected and saved but not yet submitted.

Select a project from your list to enter the project's "Collecting" page, or directly click the "Collecting" tab on the Project Page.

The red number next to the "Collecting" tab in the lefthand menu indicates the number of records you have collected and saved but not yet submitted. The search bar allows you to filter the records by method, site name, management regime, or observer name. Click on the table headers to sort based on your preference.

MERMAID BETA Projects Reference Global Dashboard What's new

Mermaid Reef Survey

DATA

- Collecting** (2)
- Submitted

METADATA

- Sites
- Management Regimes

OVERVIEW

- Observers and Transects
- Management Regimes Overview

ADMIN

- Project Info
- Users
- Data Sharing
- You're **ONLINE**

Collecting

Filter this table by method, site, management, or observer

[+ Add Sample Unit](#)

Method	Site	Management Regime	Sample Unit #	Size	Depth (m)	Sample Date ▲	Observers
Fish Belt	1208		1	-		February 28, 2023	-
Benthic PIT	1208		1	-			-

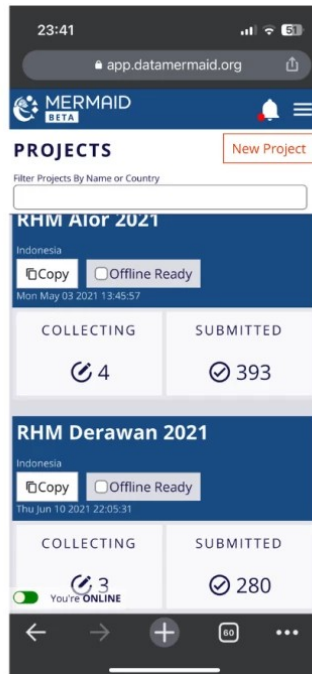
Showing 2 of 2 sample units [Back](#) [Next](#)

Only users with 'Collector' or 'Administrator' roles can collect and submit new observations; 'Read-only' users cannot collect sample units.

A sample unit requires validation prior to submission. Validation will ensure that all data in a sample unit are correct. If not, an error or warning will appear on top of the page and next to the issue that need to be resolved.

Observations can be added both online and ~~no~~, but they can only be validated and submitted when connected to the internet.

MERMAID Version 2 also provides an improved experience to record data using a mobile phone.



ADDING NEW SITES AND MANAGEMENT REGIMES

In the lefthand menu you can find "Sites" and "Management Regimes". Here admins and collectors can add a new site or management regime to a project. A site is a unique latitude and longitude, with accompanying attributes; a management regime is the area (including MPAs, OECMs, or open access zones) defined by a set of rules in effect at the time of data collection.

Adding a new site

Navigate to the "Sites" tab and select "+ New site"

A new site requires a name, country, coordinates, and details on the exposure, reef type, and reef zone. The name can be the site's common name or unique ID. When all details have been added, save the site.

In the "Sites" tab you can choose "**Copy sites from other projects**" to add existing sites and their metadata from other MERMAID projects.

[Projects](#)
[Reference](#)
[Global Dashboard](#)
[What's new](#)

Mermaid Reef Survey

DATA

- Collecting
- Submitted

METADATA

- Sites
- Management Regimes

OVERVIEW

- Observers and Transects
- Management Regimes Overview

ADMIN

- Project Info
- Users
- Data Sharing
- You're ONLINE

Sites

Filter this table by name, reef type, reef zone, and exposure.

[+ New site](#)
[Copy sites from other projects](#)
[Export sites](#)

Name ▲	Reef Type	Reef Zone	Exposure
1208	barrier	back reef	sheltered
1209	barrier	back reef	sheltered
1210	barrier	back reef	exposed

Showing 3 of 3 sites

Allen Coral Atlas

- ☒ Satellite Coral Reef Mosaic
- ☒ Geomorphic Analysis
- ☒ Back Reef Slope
- ☒ Deep Lagoon
- ☒ Leeward Reef Flat

A new site created by one user is shared across the project with all other users and available for them to use in observations. Best practice is to plan the sampling sites for your project in advance and add them before going to the field.

If multiple new sites have identical coordinates, they will be flagged as **duplicate sites if used in submitted sample units**. In other words, MERMAID will detect duplicate sites only if used in a project. If this happens, for example because multiple team members add the same site while you will see a warning after you hit the "Validate" button next to the "Site" field within a sample unit that says "Site: Similar records detected". Click "Resolve" to decide whether to merge the duplicate sites or keep them separate.

Projects Reference Global Dashboard What's new

DATA

Collecting

4306 1 Big Fish

Submitted

METADATA

OVERVIEW

ADMIN

Sites

Management Regimes

Observers and Transects

Management Regimes Overview

Project Info

Users

Data Sharing

You're ONLINE

Fish Belt 4306 1 Big Fish

Saved

Update

Submit

Sample Event

Site *

4306

Management *

Outside MPA [Control]

Sample Date *

10/09/2020

Transect

Transect Number *

1

Label

Big Fish

Sample Time

13.00

Depth *

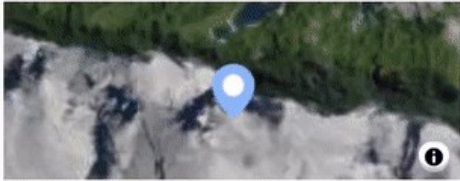
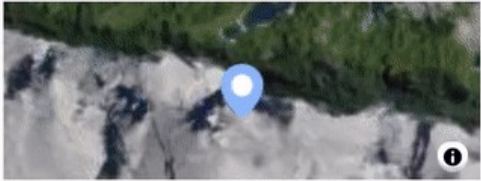
10 m

A dialog box will show you which sites are considered duplicates. Here you can decide whether to keep one site and merge it with the duplicate sites, or to edit a site and change the metadata to indicate that they actually are separate, unique sites. **Unique sites must have different coordinates.**

If you choose to keep a site, the site that will be merged with the site you chose to keep will be highlighted in yellow. Select “Merge” to confirm.

Resolve Duplicate

×

	Original site	✓ Keep site	Edit site	Duplicate site	✓ Keep site	Edit site
Name	4306			4306		
Country	Indonesia			Indonesia		
Latitude	-2.0022			-2.0022		
Longitude	130.568			130.568		
Map						
Exposure	exposed			exposed		
Reef Type	fringing			fringing		
Reef Zone	crest			fore reef		

When sites have been merged, the sites will be updated with the single merged site, and this merged site will automatically be assigned to all sample units that were using the duplicate sites. All observation data will be preserved.

Adding a new management regime

Navigate to the “Management Regimes” tab and select “+ New MR”

MERMAID NEITA Projects Reference Global Dashboard What's new

Mermaid Reef Survey

DATA

Collecting Submitted

Management Regimes

Filter this table by name or year

+ New MR Copy MRs from other projects Export MRs

Management Regime Name	Secondary Name	Year Est.	Compliance	Open Access	Access Restrictions	Periodic Closure	Size Limits	Gear Restrictions	Species Restrictions	No Take
Control	Outside MPA			✓						
NITZ	Inti									✓
Use	Tradisional									

Showing 3 of 3 management regimes

Back Next

dir-app-datamermaid.org/projects/-/new

A new management regime requires a name and at least one rule; all other details are optional. "Open Access" is the default for the "Rules". When you are finished, save the management regime. You can also delete using the "Delete Management Regime" button at the bottom of the page. **Only saved management regime can be deleted.**

On the "Management Regimes" page you can also choose "**Copy MRs from other projects**" to add existing management regimes and their metadata from other MERMAID projects.

A new management regime created by one user is shared across the project with all other users and is available for them to use in observations. Best practice is to know the management regimes within your project in advance and add them while online, before going to the field. Management regime details can be edited after creation if needed.

Fish Belt 4306 1 Big Fish

Errors or warnings are preventing you from submitting x

Sample Event

Site * 4306

Management * Outside MPA [Control]
 ERROR At least one rule must be specified for this Management Regime.

Sample Date * 10/09/2020

Multiple management regimes with identical names will be flagged as **duplicate management regimes**. If this happens, you will see a warning next to the "Management" field that says "Another Management Regime is similar to this one".

These management regimes can be merged or kept separate. Click "Resolve" button to decide whether to merge the duplicate management regimes or keep them separate.

Fish Belt 1209 1

Errors or warnings are preventing you from submitting x

Sample Event

Site * 1209

Management * Control [Outside MPA]
 WARNING Another Management Regime is similar to this one.

Sample Date * 02/03/2023

A dialog box will show you which management regimes are considered duplicates. Here you can decide whether to keep just one management regime or to edit a management regime and change the metadata to indicate that they actually are separate, unique management regimes. Unique management regimes must have different names.

Resolve Duplicate

×

	Original MR	✓ Keep MR	✎ Edit MR	Duplicate MR	✓ Keep MR	✎ Edit MR
Name	Control			Control		
Secondary Name	Outside MPA			Outside MPA		
Year Established						
Area						
Parities						
Compliance						
Rules	Open Access			Open Access		
Notes						

Cancel

✓ Keep both

If you want to keep just one management regime, select the “Keep MR” button. The duplicate management regime(s) that will be merged with the management regime you choose to keep will be highlighted in yellow. This merged management regime will now be assigned to all sample units that had been associated with the duplicate management regime. All observation data will be preserved. If you want to keep both management regimes, select “Keep both”.

ENTERING A TRANSECT

When you’re ready to enter new data for a project, click “+ **Add Sample Unit**” at the top right of the Collecting page and select a method.

There are six methods available in MERMAID: fish belt transects, benthic point intercept (PIT) transects, benthic line intercept (LIT) transects, habitat complexity transects, bleaching quadrat collections, and benthic photo quadrat transects. These transects are similar to methods described in the [Coral Reef Monitoring Protocol for Assessing Marine Protected Areas](#) (Ahmadi et. al 2013) (Appendix 2). The benthic photo quadrat transect currently stores your photo identification results only.

Mermaid Reef Survey

DATA

Collecting

Filter this table by method, site, management, or observer

+ Add Sample Unit

Method	Site	Management Regime	Sample Unit #	Size	Depth (m)	Sample Date	Observers
Benthic PIT	1208	Control	1		50m	10	March 1, 2023
Fish Belt	1209	Control	1	50m x Mixed: >10 cm & <35 cm @ 5 m, >=35 cm @ 20 m	10	March 2, 2023	Amkieltiela

Showing 2 of 2 sample units

Back Next

After selecting a method, you must **fill in all required fields**, marked with a red asterisk. Sites and Management Regimes that you added previously will appear in the dropdowns.

Optional transect information includes label, sample time, reef slope, visibility, current, relative depth, tide, and any notes.

Mermaid Reef Survey

DATA

Fish Belt

Save

Sample Event

Site * Choose...

Management * Choose...

Sample Date * dd/mm/yyyy

Transect

Transect Number *

Label

Each transect requires at least one 'observer', defined as a person who collected transect observations. This is a required field, and you can choose from the available list of users associated with your project. To remove an observer, uncheck the box next to the observer's name.

MERMAID Projects Reference Global Dashboard What's new

DATA Collecting 1209 1 Submitted

Observers

Observers *

☐ Amkieltiela

☐ Kim Test

Observations

	Fish Name *	Size (cm) *	Count *	Biomass (kg/ha)
1	Chaetodon aureofasciatus	20	2	15.1
2	Scarus niger	35	1	8.5

+ Add Row

Total Biomass (kg/ha) 23.6

Total Abundance 3

Delete Record

You're ONLINE

You can save a transect any time, online or offline. A disabled Save button indicates that no data have changed since the last time you saved the transect.

When online, you can validate and submit the transect. Offline, only the 'Save' button will appear.

Deleting a Transect

If you wish to delete a transect, click the "Delete Record" button at the bottom of any unsubmitted Sample Unit in Collecting. This will permanently remove the record and its observations from MERMAID, so be sure that you want to remove it before confirming.

SAMPLE UNIT TYPES

Fish belt transect

The fish belt transect records observations of fish size and abundance.

Each transect requires a transect number, depth (m), length surveyed (m), and transect belt width (options: 2m, 5m, 10m, 20 m, or mixed). Users can select how fish sizes are estimated underwater, using 1cm, 5cm, or 10cm size bins. Specialized irregular size bin schemes are also available for particular organizational definitions. The “label” field can be used to indicate a special type of fish belt transect, such as long-swim.

The screenshot displays the MERMAID BETA web application interface. The top navigation bar includes the MERMAID BETA logo, a 'Projects' link, a 'Reference' link with a calendar icon, a 'Global Dashboard' link, a 'What's new' link with a checkmark icon, and a notification bell icon. The left sidebar is divided into three main sections: 'DATA' (with a 'Collecting' status indicator and a 'Fish Belt' sub-link), 'METADATA' (with links for 'Sites' and 'Management Regimes'), 'OVERVIEW' (with links for 'Observers and Transects' and 'Management Regimes Overview'), and 'ADMIN' (with links for 'Project Info', 'Users', and 'Data Sharing'). At the bottom of the sidebar, a status indicator shows 'You're ONLINE'. The main content area is titled 'Fish Belt' and features a 'Save' button. Below the title is a 'Transect' section with the following fields: 'Transect Number *' (text input), 'Label' (text input), 'Sample Time' (datetime picker), 'Depth *' (text input with a unit dropdown set to 'm'), and 'Transect Length Surveyed *' (text input with a unit dropdown set to 'm'). The 'Width *' field is a radio button group with options: '2m', '5m', '10m', '20m', 'Mixed: < 10cm @ 2m, >= 10cm @ 5m', and 'Mixed: >10 cm & <35 cm @ 5 m, >=35 cm @ 20 m'. The bottom of the form shows the start of the 'Fish Size Bin (cm) *' field.

Observations are recorded at the bottom of the page.

After typing any three letters of an observed fish family, genus, or species, MERMAID will provide a **predictive dropdown** with names. This ensures all spelling is correct and consistent. Select the fish family, genus, or species to use for an observation by using the 'up' or 'down' arrow keys or entering more letters so that there is only one choice and press the 'Enter'/'Return' or 'Tab' key to select a name.

All fish names come from Fishbase. They can be found in the "Reference" icon at the header of any page. A new fish family, genus, or species can be proposed to the MERMAID science team for approval and addition. Proposing a genus-level spp. fish is unnecessary, because all genera are also available directly for observation.

Biomass will automatically be calculated in the last column.

To prevent errors in data entry, MERMAID will issue warnings and errors for fish belt transects like:

- Total biomass less than 50 kg/ha
- Total biomass greater than 5000 kg/ha
- Total observations less than 5

- Fish larger than maximum observed size

NAVIGATION TIP

Navigating through the observation fields is similar to navigating in Excel: use the 'Tab' key to move across to the Size and Count (abundance) columns; at the end of a row, press 'Enter'/'Return' to create a blank row and enter a new fish observation; press "Tab" at the end of a row to duplicate fish species from the last row.

Benthic point transect (PIT)

The benthic point intercept transect (PIT) records observations of benthic cover at regular intervals along a transect.

Each transect requires a transect number, depth, the surveyed transect length (m), the interval between point observations (m), and the interval point where you start to record your data (m). For example, points counted every 50 cm can be entered as 0.5m in the "Interval size" field.

The screenshot displays the 'Benthic PIT 1208 1' form in the MERMAID BETA application. The form is titled 'Transect' and contains the following fields:

- Transect Number *
- Label
- Sample Time (with a calendar icon)
- Depth * (with a unit 'm' button)
- Transect Length Surveyed * (with a unit 'm' button)
- Interval Size * (with a unit 'm' button)
- Interval Start * (with a unit 'm' button)
- Reef Slope (with radio buttons for flat, slope, wall, crest, and not reported)

The sidebar on the left shows the following navigation options:

- DATA
 - Collecting
 - Submitted
- METADATA
 - Sites
 - Management Regimes
- OVERVIEW
 - Observers and Transects
 - Management Regimes Overview
- ADMIN
 - Project Info
 - Users
 - Data Sharing

The top navigation bar includes 'Projects', 'Reference', 'Global Dashboard', 'What's new', and a notification bell icon. The bottom status bar indicates 'You're ONLINE'.

Enter the benthic attribute observed at each point at the bottom of the page.

The screenshot shows the MERMAID Benthic PIT data entry interface. The sidebar on the left contains navigation options: Collecting, Benthic PIT (selected), Submitted, METADATA (Sites, Management Regimes), OVERVIEW (Observers and Transects, Management Regimes Overview), and ADMIN (Project Info, Users, Data Sharing). The main content area is titled 'Benthic PIT' and includes a 'Save' button. Below the title, there are sections for 'Observers' (listing Amkieltiela and Kim Test) and 'Observations' (a table with columns for Interval, Benthic Attribute, and Growth Form). A '+ Add Row' button is located below the table. The top navigation bar includes links for Projects, Reference, Global Dashboard, and What's new. The bottom status bar shows 'You're ONLINE' and links for Help/PDF, Terms, Contact, Credits, and develop.

After typing any three letters of an observed benthic attribute, MERMAID will provide a predictive dropdown with names. This ensures that all spelling is correct and consistent. Select the benthic attribute by using the 'up' or 'down' arrow keys on your keyboard or with your mouse, or entering more letters so that there is only one choice, and then pressing the 'Enter'/'Return' or 'Tab' key to select a name. Growth forms can be selected from the dropdown list or predicted by typing.

Available benthic attributes can be found using the "Reference" icon at the header of any page. New benthic attributes can be proposed to the MERMAID science team for approval and addition.

The number of rows should equal the total number of expected points based on your transect length and interval size. You will receive a warning if the number of entered rows does not match this.

The percent cover of each benthic category along the transect will automatically be calculated and displayed at the bottom of the rows. All benthic attributes belong hierarchically to a small number of top-level benthic categories commonly used for analysis, such as "hard coral".

NAVIGATION TIP

Use the 'Tab' key to move across to the attribute and growth form columns. At the end of the row, press 'Enter'/'Return' to create a blank row and add a new benthic

attribute observation. Press the 'Tab' key at the end of the row to duplicate the benthic attribute in the next row.

Benthic line transect (LIT)

The benthic line intercept transect (LIT) records observations of benthic cover length along a transect.

Each transect requires a transect number, depth (m), and the surveyed transect length (m).

The screenshot displays the 'Mermaid Reef Survey' web application interface. The top navigation bar includes the 'MERMAID REEF' logo, a 'Projects' dropdown, a 'Reference' link, a 'Global Dashboard' link, and a 'What's new' notification. The main content area is titled 'Mermaid Reef Survey' and features a sidebar on the left with sections: 'DATA' (with 'Collecting' and 'Submitted' options), 'METADATA' (with 'Sites', 'Management Regimes', and 'Observers and Transects'), 'OVERVIEW' (with 'Management Regimes Overview'), and 'ADMIN' (with 'Project Info', 'Users', and 'You're ONLINE'). The main form is titled 'Benthic LIT' and includes a 'Save' button. It is divided into two sections: 'Sample Event' and 'Transect'. The 'Sample Event' section contains three fields: 'Site *' (a dropdown menu showing '1208'), 'Management *' (a dropdown menu showing 'Control [Outside MPA]'), and 'Sample Date *' (a date picker showing '02/03/2023'). The 'Transect' section contains two fields: 'Transect Number *' (a text input field with the value '1') and 'Label' (a text input field).

Enter the benthic observations from the transect at the bottom of the form.

The screenshot shows the MERMAID Benthic LIT data entry interface. The sidebar on the left contains navigation links: Collecting, Benthic LIT (selected), Submitted, Metadata (Sites, Management Regimes), Overview (Observers and Transects, Management Regimes Overview), and Admin (Project Info, Users, Data Sharing). The main content area is titled 'Benthic LIT' and includes a 'Save' button. Below the title, there are sections for 'Observers' (listing Amkielieia and Kim Test) and 'Observations'. The Observations section has a table with columns for 'Benthic Attribute', 'Growth Form', and 'Length (cm)'. A '+ Add Row' button is located below the table. The bottom of the interface shows a status bar with 'You're ONLINE' and links to Help/FAQ, Terms, Contact, Credits, and develop.

After typing any three letters of an observed benthic attribute, MERMAID will provide a predictive dropdown with names. This ensures that all spelling is correct and consistent. Select the benthic attribute by using the 'up' or 'down' arrow keys on your keyboard or with your mouse, or entering more letters so that there is only one choice, and then pressing the 'Enter'/'Return' or 'Tab' key to select a name. Growth forms can be selected from the dropdown list or predicted by typing.

Available benthic attributes can be found using the "Reference" icon at the header of any page. New benthic attributes can be proposed to the MERMAID science team for approval and addition.

The sum of the observation lengths entered should equal the total transect length. You will receive a warning if not.

The percent cover of each benthic category along the transect will automatically be calculated and displayed at the bottom of the rows. All benthic attributes belong hierarchically to a small number of top-level benthic categories commonly used for analysis, such as "hard coral".

NAVIGATION TIP

Use the 'Tab' key to move across to the attribute, growth form, and length columns. At the end of the row, press 'Enter'/'Return' to create a blank row and add a new benthic attribute observation. If the same attribute is observed but with a different length, press the 'Tab' key at the end of the row to duplicate the benthic attribute in the next row.

Benthic Photo Quadrat

This sample unit records the results of photo identification from benthic photo quadrats along a transect.

Each transect requires a transect number, depth (m), surveyed transect length (m), the starting quadrat number, the quadrat size (m²), the number of quadrats, and the number of points per quadrat.

MERMAID BETA Projects Reference Global Dashboard What's new

DATA

- Collecting
- Submitted

Benthic Photo Quadrat

Transect

Transect Number *

Label

Sample Time

Depth * m

Transect Length Surveyed * m

Quadrat Number Start * 1

Quadrat Size * 1 m²

Number of Quadrats *

Number of Points per Quadrat *

Benthic Photo Quadrat

Enter the photo identification results from the photo quadrat observations at the bottom of the form.

The screenshot shows the MERMAID BETA interface for data collection. The top navigation bar includes links for Projects, Reference, Global Dashboard, and What's new. The left sidebar lists various sections: DATA (Collecting, Submitted), METADATA (Sites, Management Regimes), OVERVIEW (Observers and Transects, Management Regimes Overview), and ADMIN (Project Info, Users, Data Sharing). The main content area is titled 'Benthic Photo Quadrat' and features a 'Save' button. Below this, there are sections for 'Observers' (listing Amkieltiela and Kim Test) and 'Observations'. The observations section includes a table with columns for Quadrat, Benthic Attribute, Growth Form, and Number of Points, and a '+ Add Row' button. A 'Delete Record' button is also present at the bottom right. The status bar at the bottom indicates 'You're ONLINE' and provides links for Help/PDF, Terms, Contact, and Credits.

Each observation must record the total number of points identified as a particular benthic attribute in a particular photo quadrat.

After typing any three letters of an observed benthic attribute, MERMAID will provide a predictive dropdown with names. This ensures that all spelling is correct and consistent. Select the benthic attribute by using the 'up' or 'down' arrow keys on your keyboard or with your mouse, or entering more letters so that there is only one choice, and then pressing the 'Enter'/'Return' or 'Tab' key to select a name. Growth forms can be selected from the dropdown list or predicted by typing.

Available benthic attributes can be found using the "Reference" icon at the header of any page. New benthic attributes can be proposed to the MERMAID science team for approval and addition.

The sum of the points in the observations entered for that quadrat must equal the total number of points entered at the transect level above.

The percent cover of each benthic category along the transect will automatically be calculated and displayed at the bottom of the rows. All benthic attributes belong hierarchically to a small number of top-level benthic categories commonly used for analysis, such as "hard coral".

NAVIGATION TIP

Use the 'Tab' key to move across to the attribute, growth form, and number of points columns. At the end of the row, press 'Enter'/'Return' to create a blank row and add a new benthic attribute observation. Press the 'Tab' key at the end of the row to duplicate the benthic attribute in the next row.

Coral bleaching

This rapid assessment field method can be used to quantify coral bleaching for different genera of hard corals.

In this rapid assessment field method, the sample unit is a collection of quadrats observed for coral bleaching on a single dive/snorkel. [The method is described in detail here.](#)

First, observers choose a consistent quadrat size (typically 1 to 2 m²) to use on the survey. During a survey, an observer records information from a set of quadrats, typically ~15-20 quadrats. Within a quadrat, an observer first counts the number of coral colonies for each hard coral genus and classifies each colony within 7 categories of bleaching severity: normal, pale, 0-20% bleached, 20-50% bleached, 50-80% bleached, 80-100% , and recently dead. After recording the coral colonies, the observer then visually estimates the cover of three main benthic groups within the quadrat: hard coral, macroalgae, and soft coral. Then, the observer swims a set distance (e.g., 10 fin kicks) to begin the next quadrat.

In MERMAID, observations from the surveys are recorded in 2 sections. The 'colonies bleached' sections records the total number of colonies in each bleaching category for each genus. The 'percent cover' section records the % cover of hard coral, macroalgae, and soft coral for each quadrat.

Number of Colonies								
Benthic Attribute *	Growth Form	Normal	Pale	0-20% bleached	20-50% bleached	50-80% bleached	80-100% bleached	Recently dead
+ Add Row								
Total number of colonies								0
Total number of coral genera								0
% Normal colonies								0
% Pale colonies								0
% Bleached colonies								0

NAVIGATION TIP

Use the 'Tab' key to move across the colonies bleached and percent cover columns. At the end of the row, press 'Enter'/'Return' key to create a blank row to add the next

complexity observation. If the same bleaching or percent cover is observed at the next interval, press the 'Tab' key at the end of the row to duplicate.

Habitat complexity

This transect records observations of benthic habitat complexity on a scale of 0 to 5, based on the methodology proposed in Wilson et al. (2007) and described in Darling et al. (2017) and Gurney and Darling (2017) (Appendix 2).

To enter a habitat complexity transect, you will need to provide a transect number, depth (m), the surveyed transect length (m), and the interval between complexity observations (m). For example, assessing complexity every 5 m can be entered at '5 m' in the "Interval size" box.

The screenshot displays the MERMAID BETA web application interface. The top navigation bar includes links for Projects, Reference, Global Dashboard, and What's new. The left sidebar contains a menu with sections: DATA (Collecting, Submitted), METADATA (Sites, Management Regimes), OVERVIEW (Observers and Transects, Management Regimes Overview), and ADMIN (Project Info, Users, Data Sharing). The main content area is titled 'Habitat Complexity' and features a 'Save' button. Below the title is a 'Transect' section with the following fields: Transect Number (required), Label, Sample Time (with a clock icon), Depth (required, with a unit 'm' dropdown), Transect Length Surveyed (required, with a unit 'm' dropdown), Interval Size (required, with a unit 'm' dropdown), and Reef Slope (radio buttons for flat, slope, wall, crest, and not reported). The bottom of the page is reserved for entering habitat complexity scores at each interval.

Enter the habitat complexity score at each interval at the bottom of the page. You must have as many rows of observations as you do intervals in the transect length.

NAVIGATION TIP

Use the 'Tab' key to move across the interval and habitat complexity score columns. At the end of the row, press 'Enter'/'Return' key to create a blank row and add the next complexity observation. If the same habitat complexity is observed at the next interval, press the 'Tab' key at the end of the row to duplicate the previous row.

SAVING A TRANSECT

Once you enter any new information into a transect, you can save it using the button in the upper right corner of the page.

The save button is bright red when there is new information to be saved. If the button is gray and says “Saved”, you have already saved the transect and there is no new information to be saved.

The screenshot shows the MERMAID BETA web application. The main header includes the MERMAID BETA logo, navigation links (Projects, Reference, Global Dashboard), and a 'What's new' notification. The left sidebar contains a 'DATA' section with 'Collecting' and 'Submitted' tabs, and a 'METADATA' section with 'Sites', 'Management Regimes', 'OVERVIEW' (Observers and Transects, Management Regimes Overview), and 'ADMIN' (Project Info, Users, Data Sharing). The main content area is titled 'Benthic PIT 1208 1' and features a 'Save' button. Below the title, there are two sections: 'Sample Event' and 'Transect'. The 'Sample Event' section has three fields: 'Site' (dropdown menu with '1208' selected), 'Management' (dropdown menu with 'Control [Outside MPA]' selected), and 'Sample Date' (calendar icon with '03/03/2023' selected). The 'Transect' section has four fields: 'Transect Number' (text input with '1' entered), 'Label' (text input), 'Sample Time' (time picker with '11:--' selected), and 'Depth' (text input with '10 m' entered).

After saving, you can always return to the transect to add or change data and information and resave.

If you try to navigate away from a page with unsaved information, you will see a warning on the screen that you have unsaved data – choose “Cancel” to stay on the transect and save; choose “Ok” to leave the transect unsaved.

Once you validate and successfully submit your transect, you can no longer edit it. If you need to edit a submitted transect, a project admin must un-submit it; if you are not the project admin, they will then need to transfer it to you for editing.

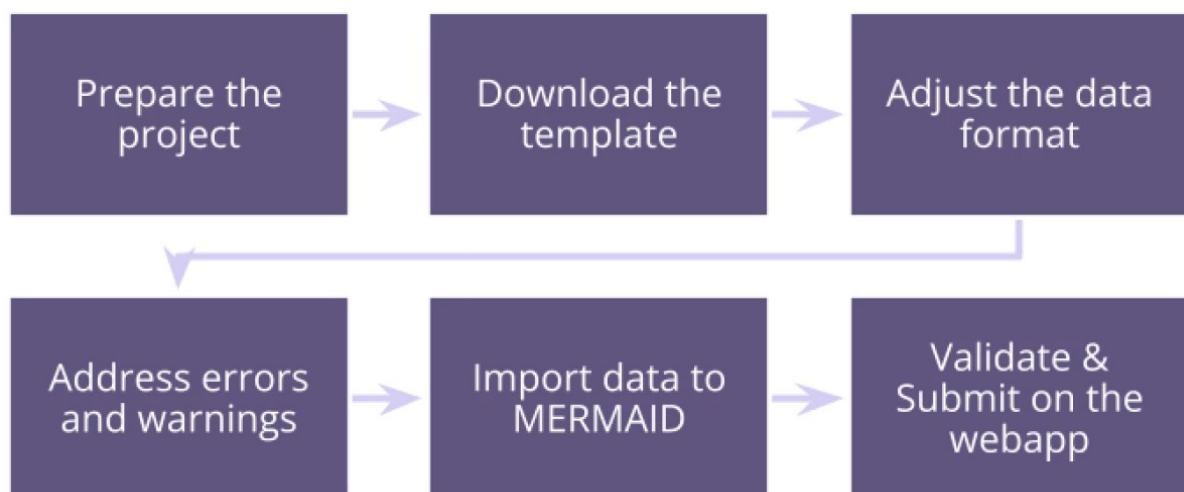
All sample units are always saved on your computer. Any time you are online, MERMAID also saves to a backed-up database in the Cloud.

INGESTING LEGACY DATA USING MERMAIDR

Legacy data can now be ingested to MERMAID using the mermaidr R package.

If you are new to MERMAID but have data from past surveys in other formats, you may be trying to figure out how to import your legacy data into MERMAID. The mermaidr package is a way to ingest your old data into MERMAID. **However, the ingestion process requires a fair amount of time to prepare your data in the correct format.**

Ingesting data should only be used for legacy data. For an ongoing project, it is easier to use the app directly.



The ingestion workflow

Steps for ingestion using the mermaidr package:

Create a project in MERMAID with sites, management regimes, and users added.

Adjust your data format to the MERMAID template. You can download the template for each method using the `mermaidr::import_get_template_and_options()` function from the mermaidr package. More information on how to use it can be seen [here](#).

Ensure the mandatory fields are filled. Mandatory fields include an asterix (*) sign in the column name.

Check each field to make sure it matches allowed field options for importing data for a given method. To check each field, use the `mermaid_import_check_options` function from the mermaidr package. More information and example on how to use it can be seen [here](#). A field that matches will produce a green check sign.

After all fields have passed the checking process, you can import your data using the `mermaid_import_project_data` function from the mermaidr package. Detailed information and an example can be seen [here](#).

All ingested data will appear on the Collecting page. These data will need to go through the regular validation and submission process.

Unsubmitted ingested transects appear on the Collecting page of the user who did the ingesting. To transfer unsubmitted sample units to another user, a project admin can use the project's Users page.

The screenshot displays the MERMAID BETA web application. The top navigation bar includes links for Projects, Reference, Global Dashboard, and a 'What's new' section. The main heading is 'PROJECTS', with a 'New Project' button. Below this is a search bar labeled 'Filter Projects By Name or Country' and a 'Sort By' dropdown menu set to 'Project Name'. The selected project is 'Kei Kecil MPA' in Indonesia. A summary row shows: COLLECTING (306 / 306), SUBMITTED (295), SITES (37), USERS (3), and DATA SHARING (Fish belt: Public Summary, Benthic: Public Summary, Bleaching: Public Summary). The interface also features a 'Copy' button and an 'Offline Ready' status indicator.

COLLECTING	SUBMITTED	SITES	USERS	DATA SHARING
306 / 306	295	37	3	Fish belt: Public Summary Benthic: Public Summary Bleaching: Public Summary

The ingested data will appear on the Collecting Page where you can access it directly from the Project Page

Validating data

After your data has been saved, it can be validated. Validation is the “proofreading” of the sample unit information and observations. This is where mistakes and outliers are caught and brought to your attention to correct.

Validation can only be done online.

After saving a transect, **click the activated red “Validate” button to validate your transect.**

The screenshot displays the MERMAID BETA web application interface. The top navigation bar includes links for 'Projects', 'Reference', 'Global Dashboard', and 'What's new'. The left sidebar contains a 'DATA' section with 'Collecting' and 'Submitted' options, and a 'Fish Belt 1' section. The main content area is titled 'Fish Belt 1' and contains two sections: 'Sample Event' and 'Transect'. The 'Sample Event' section has three fields: 'Site' (1208), 'Management' (Choose...), and 'Sample Date' (dd/mm/yyyy). The 'Transect' section has five fields: 'Transect Number' (1), 'Label', 'Sample Time', 'Depth' (10 m), and 'Transect Length Surveyed' (50 m). At the top right of the form, there are three buttons: 'Saved', 'Validate' (highlighted in red), and 'Submit'.

After successfully validating a transect and resolving any errors or warnings, the Validate button will be grayed out and the Submit button will be activated in red. After validating, you will receive one of the following results:

A. Success!

Nice work, your sample unit was validated successfully! There are no errors with the data and it is ready to submit.

B. Warnings

A yellow warning will appear at the top of the page or by and individual form field if MERMAID identifies a potential issue in your transect information. Warnings are validations that identify entered data that are possible, but unusual.

You can decide whether each warning can safely be ignored for your data. If the issue resulted from a data entry mistake, you can correct the data in the field, or in some cases by clicking a “Resolve” button to open a dialog where you can add or change the information. Click “update” to incorporate your changes into the transect. You can also navigate to fields with issues by clicking 'Scroll to observations' next to the warning.

After addressing warnings, resave the transect and validate again. Repeat the process for any additional warnings that are identified. If you don’t believe a warning is accurate for your transect, you can disregard it by clicking the 'Ignore warning' checkbox next to the warning.

C. Errors

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Fish Belt 1208 1

Errors or warnings are preventing you from submitting.

[Scroll to observations](#)
☐ Ignore warning

[Scroll to observations](#)
☐ Ignore warning

[Scroll to observations](#)
☐ Ignore warning

WARNING Total fish count less than 10
WARNING Fewer than 5 observations
WARNING Fish biomass less than 50 kg/ha
ERROR One or more invalid transect fields: site, management, date, number, width, depth
ERROR System validation error:
 management: Management is required
 sample_date: Sample date is required

Sample Event

Site * **WARNING** Site: Similar records detected

Management * **ERROR** Required

Sample Date * **ERROR** Required

A red warning message will appear if MERMAID identifies an error in a sample unit's information or observations. Errors must be resolved before a transect can be submitted; they cannot be ignored. To address each error, scroll down to the field that has the 'ERROR' notice and directly change the information.

After resolving all errors, resave the transect and validate again. Repeat the process for any additional errors that are identified, until all 'ERROR' notices have disappeared.

D. Submit data

When you are finished entering data for a sample unit and have resolved all Errors and Warnings, you can Submit the sample unit.

After submitting data, admin users can still edit the transect or return a transect to the observer, so as a collector, make sure your data are finalized and clean before submitting! **Submitting data can only be done when online.**

To submit data, select the red button in a validated transect that says **“Submit”**.

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Fish Belt 1209 1

Saved Validated Submit

IGNORED Total fish count less than 10
 IGNORED Fewer than 5 observations
 IGNORED Fish biomass less than 50 kg/ha

Scroll to observations ☒ Ignore warning
 Scroll to observations ☒ Ignore warning
 Scroll to observations ☒ Ignore warning

Sample Event

Site * 1209
 Management * NTZ [inti]
 Sample Date * 03/03/2023

Transect

Transect Number * 1

Submitting data moves it from the "Collecting" page to the "Submitted" page. This shares your observations with the other users in the project (and depending on Data Sharing settings, potentially with the world). Within the "Submitted" page, admins can edit or delete transects or return them to their original observers for further editing.

If you are a read-only member on a project you can see data once it has been submitted and you can export it, but you cannot edit this data while it is in MERMAID.

The Overview page

The OVERVIEW area provides project-level views of how a project is progressing and easy ways to find out who to chase for missing data.

The 'Observers and Transects' page summarizes the number of submitted and unsubmitted transect(s) per site and method. Hover over each transect number to see detailed information including who was the last person editing the transect, who were the observer(s) collecting the transect, site name, management regime, and collecting date. You can also head to the submitted transect by clicking the 'View Submitted Sample Unit'.

MERMAID BETA Mermaid Reef Survey

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Observers and Transects

Filter this table by site or method

Site	Method	Submitted Transect Number	Transect Number / User
1208	Fish Belt	1	Amkieltiela
1208	Benthic LIT	1	
1208	Benthic PIT	1	
1208	Benthic LIT	1	
1209	Fish Belt	1	
1209	Benthic LIT	1	
1209	Benthic PIT	1	


Showing 7 of 7 records

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The 'Management Regimes Overview' summarizes the number of submitted (not unsubmitted) sample units per management regime. **Management regimes that have no submitted transects will not appear in the 'Management Regimes Overview' table.** You can click on the transect number to jump to the submitted sample unit information.

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Filter this table by site or method

Site ▲	Method	Transect Number / Management Regime	
		Control	NTZ
1208	Fish Belt	1	-
1209	Fish Belt	-	1

Showing 2 of 2 records

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Help (PDF)TermsContactCredits 5 Oct 1924

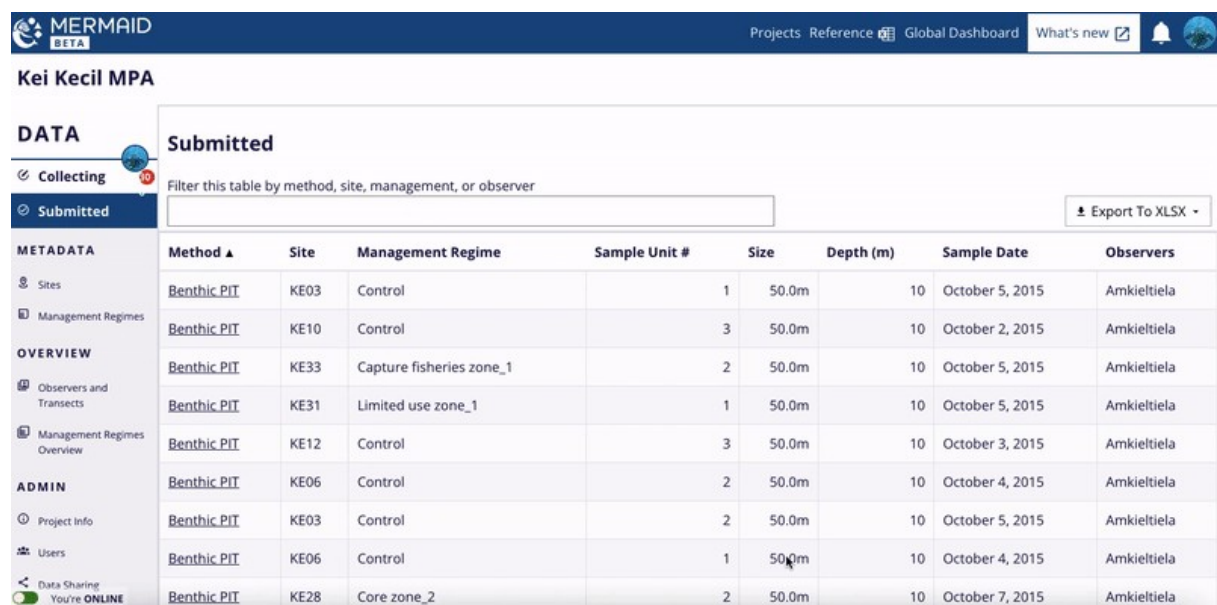
Accessing data

EXPORT TO XLSX

Submitted transects can be exported to a tabular format in a .xlsx file for further analysis by clicking the 'Export To XLSX' button.

Data can only be exported when online and after transects have been submitted. **Data in a test project will not be exported.**

Make sure that the project is not a test project. Select which method you would like to download. All records of each sample unit with the same method will be combined into a single spreadsheet. This will begin downloading a .xlsx to your computer. All user levels (admin, observer, and read-only) can export data from a project.



Submitted							
Filter this table by method, site, management, or observer							
Method	Site	Management Regime	Sample Unit #	Size	Depth (m)	Sample Date	Observers
Benthic PIT	KE03	Control	1	50.0m	10	October 5, 2015	Amkieltiela
Benthic PIT	KE10	Control	3	50.0m	10	October 2, 2015	Amkieltiela
Benthic PIT	KE33	Capture fisheries zone_1	2	50.0m	10	October 5, 2015	Amkieltiela
Benthic PIT	KE31	Limited use zone_1	1	50.0m	10	October 5, 2015	Amkieltiela
Benthic PIT	KE12	Control	3	50.0m	10	October 3, 2015	Amkieltiela
Benthic PIT	KE06	Control	2	50.0m	10	October 4, 2015	Amkieltiela
Benthic PIT	KE03	Control	2	50.0m	10	October 5, 2015	Amkieltiela
Benthic PIT	KE06	Control	1	50.0m	10	October 4, 2015	Amkieltiela
Benthic PIT	KE28	Core zone_2	2	50.0m	10	October 7, 2015	Amkieltiela

To change a project from a "Test Project" to an actual project, click "Data Sharing" in the lefthand menu. Scroll down and uncheck the 'This is a test project' checkbox. **Wait approximately 20 minutes for the data to sync with the server,** and then you can export your data.

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Data Sharing

Data is much more powerful when shared.

Given the urgent need for global coral reef conservation, MERMAID is committed to working collectively as a community and using the power of data to help make faster, better decisions. Coral reef monitoring data is collected with the intent of advancing coral reef science and improving management. We recognize the large effort to collect data and your sense of ownership. While not required, we hope you choose to make your data available to fuel new discoveries and inform conservation solutions.

[Learn more about how your data is shared...](#)

	Private	Public Summary	Public
Fish Belt	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Benthic: PIT, LIT, and Habitat Complexity	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Bleaching	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

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Questions? You can reach out to us when online via the Contact link at the bottom of any page. An [one \(pdf\)](#) version of this documentation is also available in the same area.

R PACKAGE

MERMAID has a helpful R package for accessing and importing your data.

Although Excel or similar programs work for basic analyses, many scientists use programs like **R** (often in the **RStudio** environment) for larger datasets or more sophisticated analyses. **The mermaidr** is an R package specifically for working with MERMAID data and enables you to access your data from MERMAID, compile datasets from multiple MERMAID projects, and ingest legacy data into MERMAID.

If you would like more information and detailed instructions on usage, you can see the [package website](#). You can also find a helpful list of package functions [here](#). We

also prepared an example of using the mermaidr package for analysis, which is demonstrated [here](#). More information on how to ingest legacy data into MERMAID can be found in the [Ingesting legacy data using R studio](#) page.

If you are new to the R programming language, our [new R users guide](#) is a great place to start! If you find yourself stuck, please don't hesitate to [ask for help](#).

API

All access to MERMAID data, including that done by mermaidr, the MERMAID web application, and the dashboard, is done through an [Application Programming Interface](#) (API). If you need custom access to data, for example because you are creating a map or writing your own tool, you can use API documentation [here](#) as a guide. The documentation includes a getting started page on [how to use the Insomnia API client](#) file included with the MERMAID API code repository to access all API endpoints.