SKYLIGHT for Conservation

Skylight User Guide

Next generation insights for marine protection.

Last update: 8 March 2024

A12

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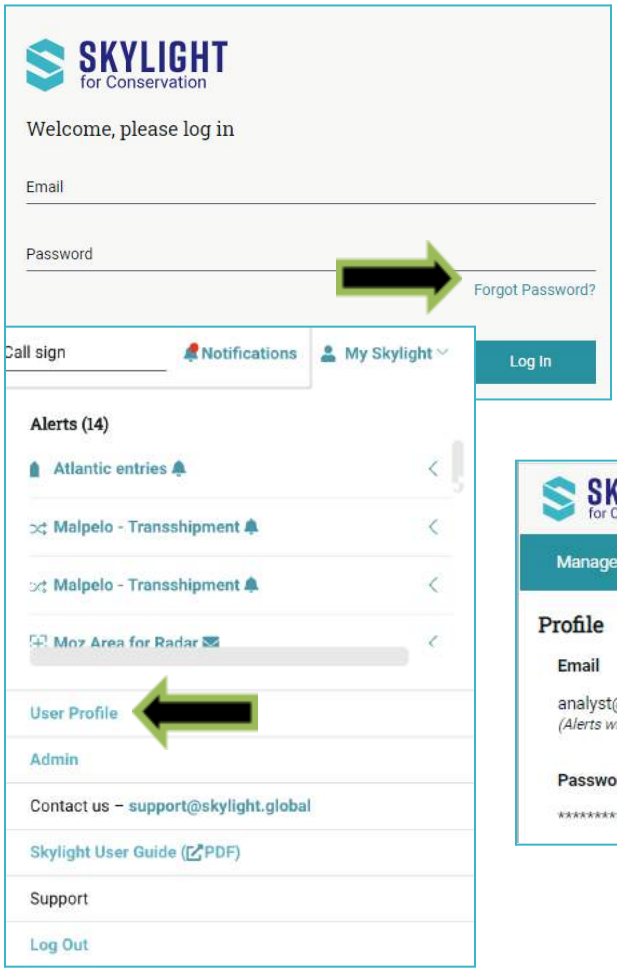
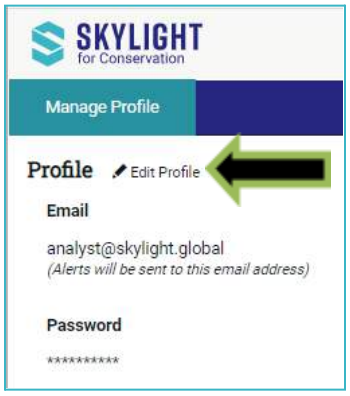
Skylight generates events to help identify behavior that analysts may review for legality or compliance with fisheries and other maritime regulations. Events are visible on a global map or as a vessel history. Skylight surfaces specific events that are interesting rather than showing all vessels and tracks to reduce the time analysts spend manually analyzing tracks. This user guide provides information about navigating all elements of Skylight.

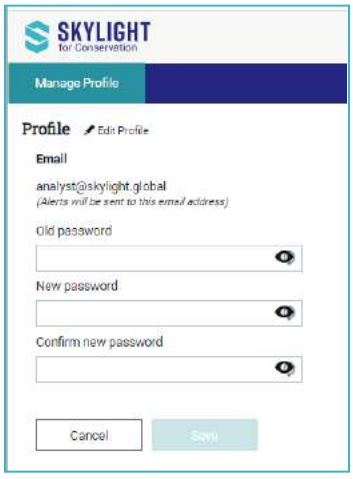
Logging In



Go to https://sc-production.skylight.earth/login to access the platform. Your username is the email address you provided to Skylight when completing the Account Creation Form.

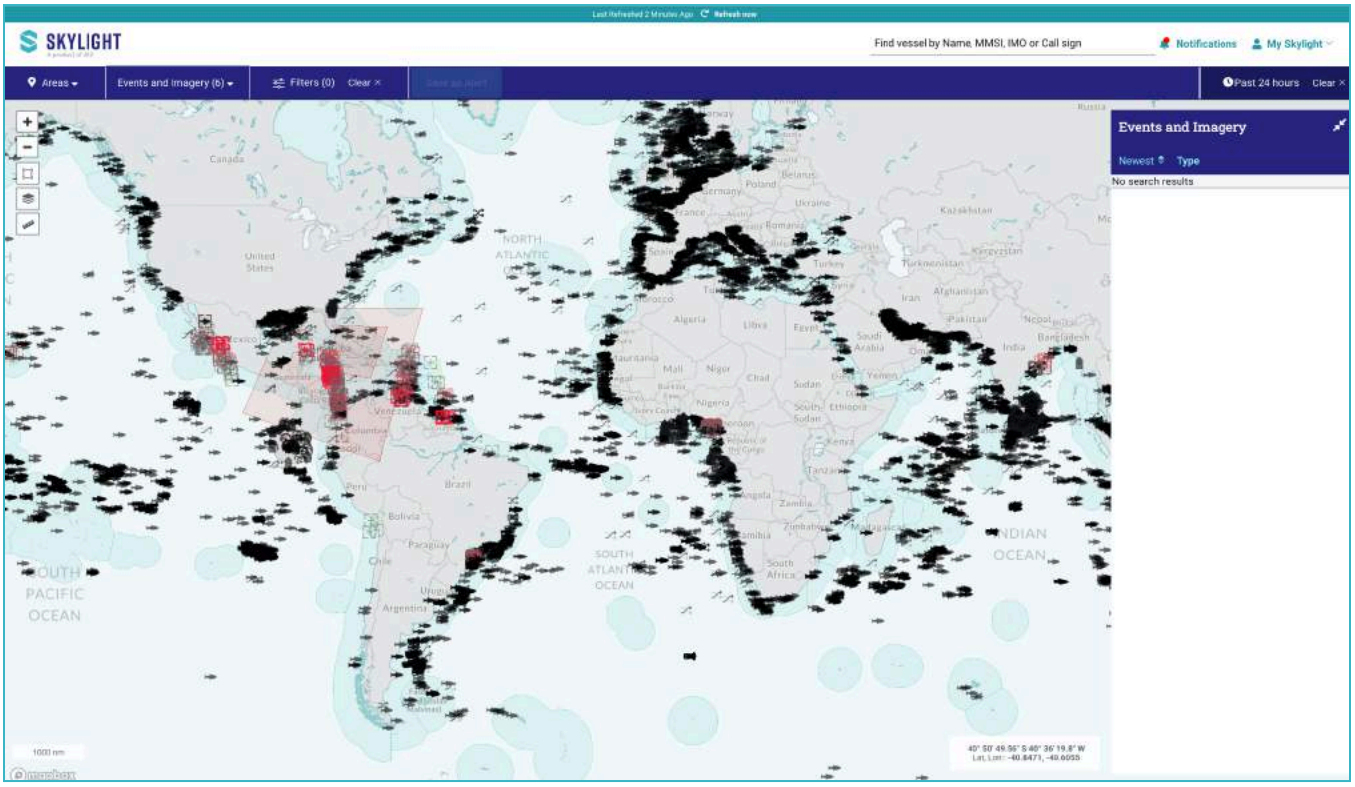
If you forgot your password, click on the “Forgot Password?” link above the Login button and follow the instructions. You can also change your Password after you log-in through your “User Profile” under the “My Skylight” menu by clicking on the “Edit Profile” icon.





General Navigation

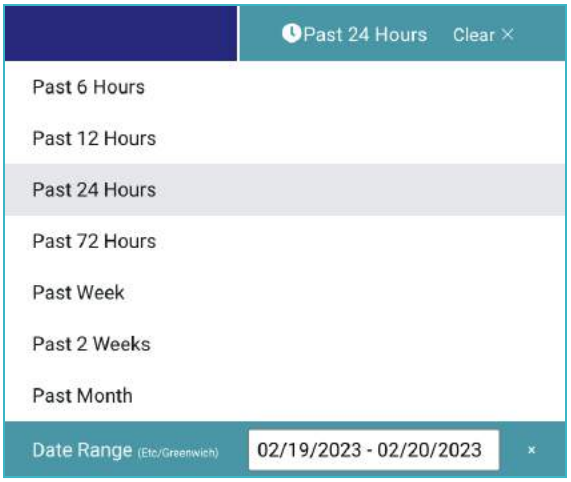
After logging in, you will have a global view of events generated in the past 24 hours.[1]



There are many ways to move the map:

- Drag the screen to pan the map
- Scroll with your mouse or use (+) and (-) controls on the left-hand side to zoom in/out
- Double-click on a specific location to zoom in

You can also use the Date Filter to change the time frame **(see right).**

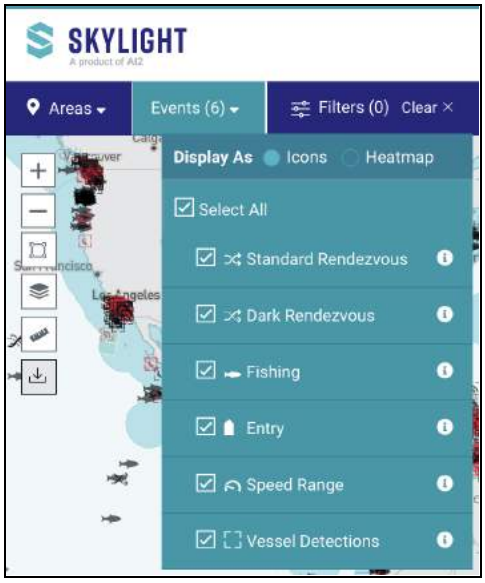


The dropdown menu under “Events” shows all the event types Skylight generates:

- Standard Rendezvous Events **(A)**
- Dark Rendezvous Events **(A)**
- Fishing Events **(A)**
- Entry Events **(C)**

[1] We use Mapbox for the basemap behind our platform: © Mapbox, 2019.

- Speed Range Events **(C)**
- Vessel Detections **(A)**



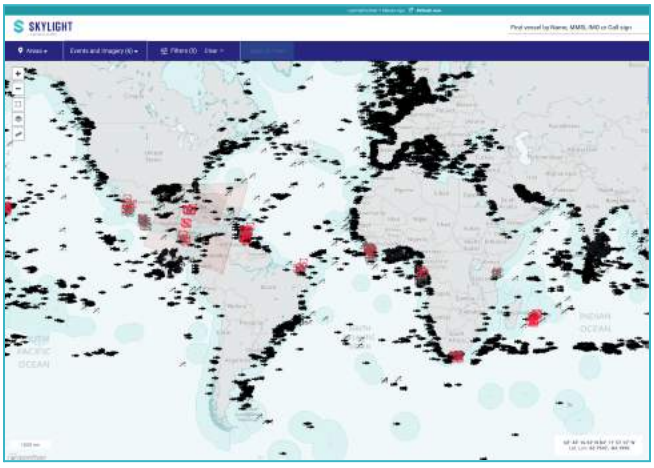
Some event types are generated automatically **(A),** while other events need to be configured to an area before they appear **(C).** Therefore when you first log-in, you may not see Entry or Speed Range Events. We describe how to configure these events later in this user guide.

You can click on specific events in two ways (1) clicking on the icon on the map, or (2) clicking on the event from the Event List (collapsible sidebar on the right). Either option will bring up more about the event.

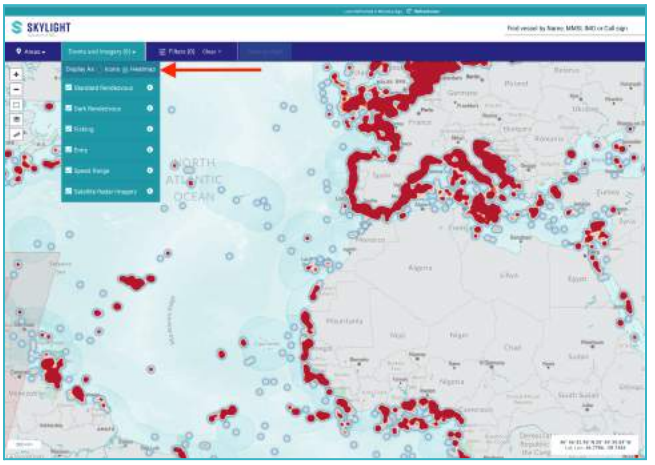
View Events as a Heatmap

Use the toggle under the Events menu to switch to a heatmap view.

Individual Events

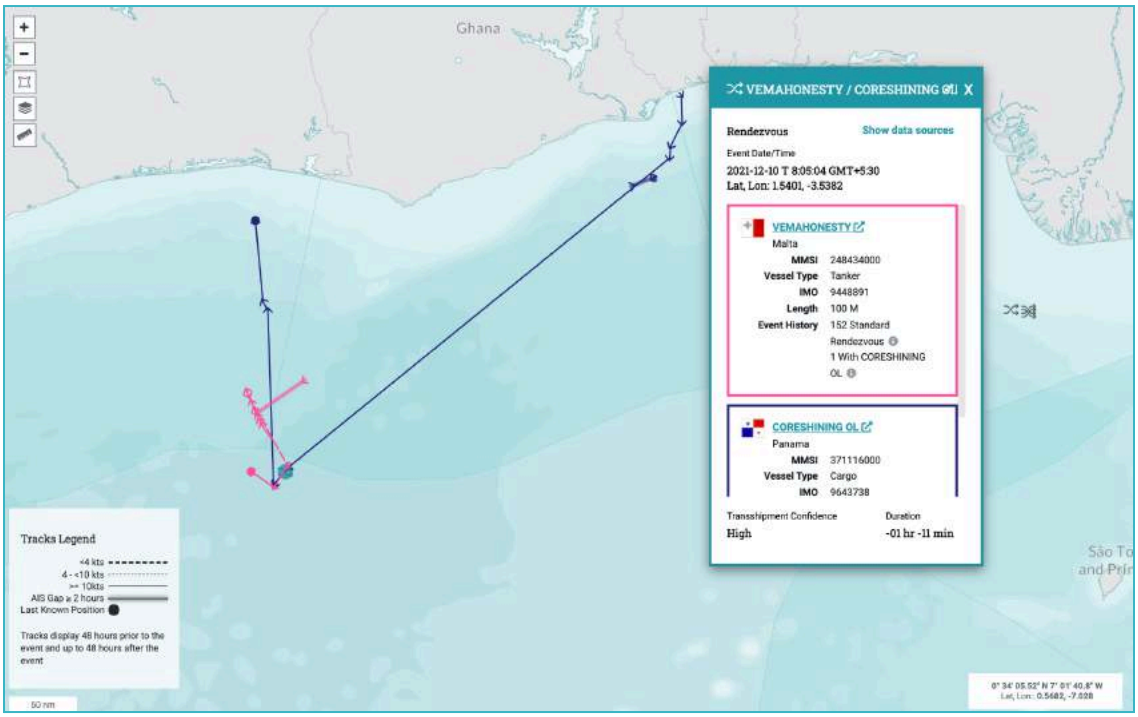


Heat Map Version



Events: Rendezvous

A **Standard Rendezvous** Event occurs when two vessels transmitting AIS travel <250 meters of each other at approximately the same speed. The goal of this event is to detect potential transshipments and bunkering. There is a delay of at least 30 minutes for the system to have confidence that transshipment behavior is occurring.



A **Dark Rendezvous** Event occurs when only one vessel transmitting AIS exhibits a track pattern indicating transshipment with another vessel (not transmitting AIS). The goal of this event is to detect potential transshipments and bunkering, but in those cases where only one vessel is visible on AIS. Dark Rendezvous Events use a machine learning model to detect possible transshipments. The model only examines the tracks of the AIS-transmitting vessel (it does not consider other data sources like imagery). Vessels cannot be traveling more than 4 knots when the loitering behavior is observed and (similar to Standard Rendezvous Events) the activity must occur for at least 30 minutes.

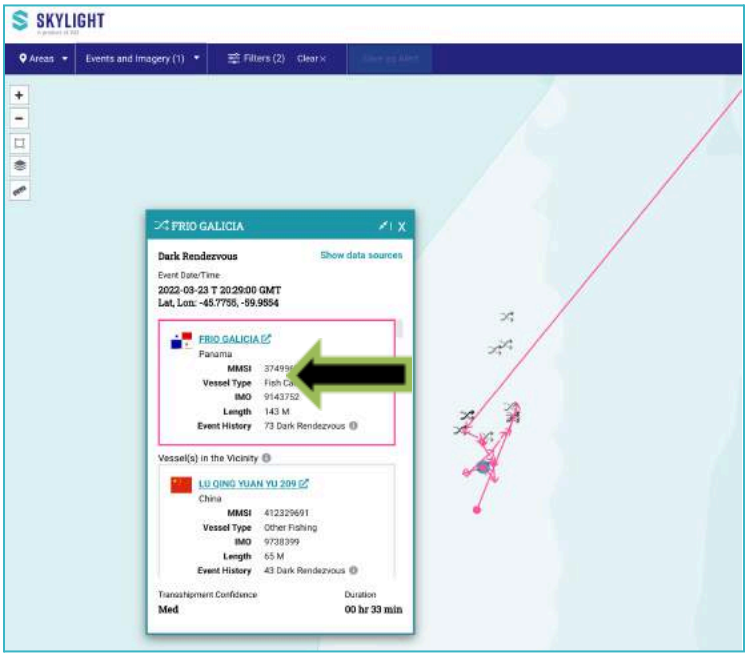
NOTE: Currently the system does not generate Standard Rendezvous Events within 10km of shore and Dark Rendezvous Events within 100km of shore. Vessels frequently travel slowly and close together without intention to meet near-shore, so these rules were set to reduce false positives.

Whether a transshipment truly happened and what was transshipped is not determinable through Skylight alone. Corroborative information from other sources like coastal radar, satellite sources or human observation are still necessary to confirm the event. It is also up to the analyst to determine

if a potential transshipment is illegal based on knowledge of local laws. Skylight only provides an indication of interesting behavior.

Rendezvous Event Details

Clicking on an event will show the vessels' tracks and more information about the activity such as: start time, start location, duration, MMSI, flag, and other vessel characteristics.



For Standard Rendezvous events, tracks for both AIS transmitting vessels are displayed on the map. For Dark Rendezvous Events, since there is only 1 vessel transmitting AIS, only the tracks for the AIS-transmitting vessel is displayed **(see right).**

Vessels in the Vicinity

When possible for Dark Rendezvous Events, Skylight offers vessels transmitting AIS within the vicinity of the event that could have observed the potential transfer. The actual partner - if there was one - may be visible in other data sources like VMS or imagery.

The last possibility is that there was no partner. Instead the maneuver was similar to that of a vessel conducting transshipment, but it was actually some other type of loitering. E.g.:

- Vessels waiting for their turn to enter port or a major strait/canal
- Vessels having an engine issue
- Vessels pulling up next to an oil platform or stationary structure

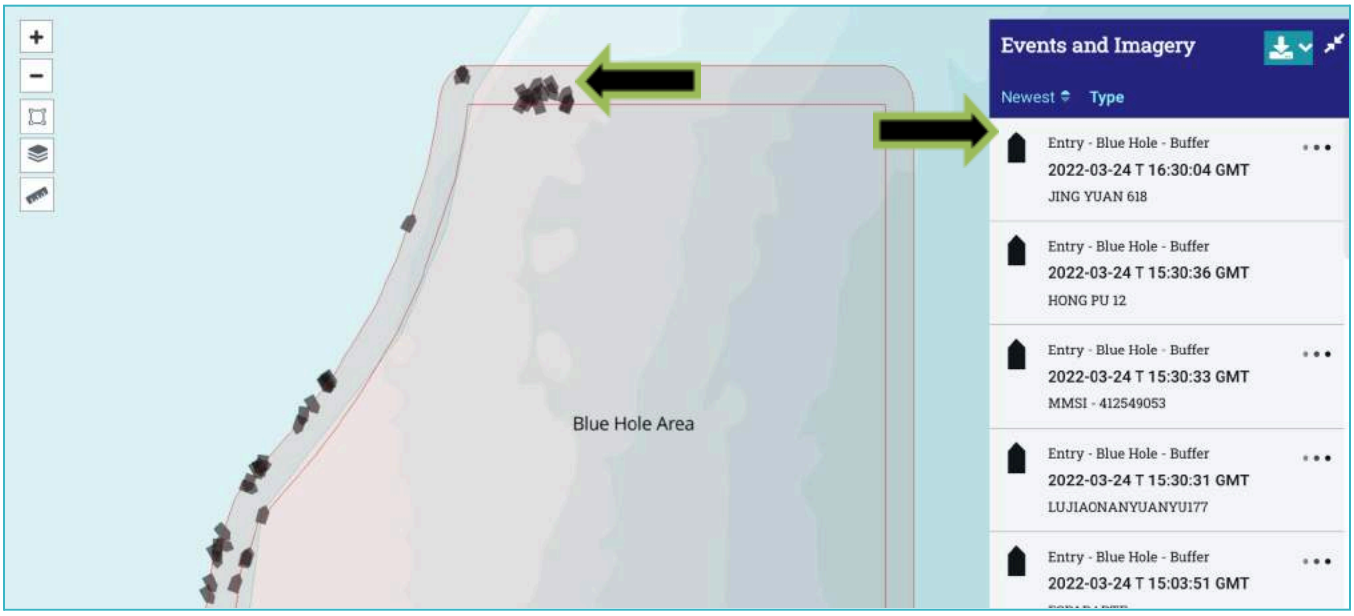
Sometimes one vessel generates multiple Dark Rendezvous events in Skylight. It is possible that the vessel is meeting multiple vessels, one vessel for a long period of time, or no vessels at all (as explained above). Multiple Dark Rendezvous events were generated because the vessel is still displaying behavior indicative of a transshipment. Later in this user guide, we describe how to use vessel tracks to further investigate what is happening during a Dark Rendezvous event (section titled "View Vessel Tracks Behind Events").

Events: Entry

An Entry Event is simple: it describes when a vessel's AIS transmission is detected inside a user-defined custom area. This can be helpful for tracking vessel entries into an EEZ, port, fishing zones, or other regulated areas that require authorization.

Unlike Rendezvous Events, Entry Events must be configured to an area before they appear on the map. Specifically, an area must be 1) created and 2) enabled for Entry Events before these events will start to appear. We describe how to do 1) and 2) in the section "Creating a Custom Area".

When a vessel enters the boundary of a custom area, this icon will appear for the Entry Event: 
NOTE: This icon does **not** indicate the vessel's current location. It shows where the vessel first transmitted inside the area. Since its entry, the vessel may have moved from the location where the icon is. Clicking on the icon will show tracks of where the vessel has moved since it first entered.



Entry Event Details

Clicking on an Entry Event will show more information about the event, specifically:

1. **Basic Vessel Details** - Click on the vessel name to view more information about the vessel
2. **Event Date/Time** - When the entry occurred
3. **Location:** Where the entry occurred in latitude and longitude coordinates.
4. **Exit Date/Time** - When the exit occurred, if one was recorded
5. **Area** - The name of the user-defined area that the vessel entered
6. **Duration** - The length of time the vessel has been in the area so far

Events: Speed Range

This is an event for monitoring AIS-transmitting vessels who meet certain speed parameters. Similar to Entry Events, Speed Range Events must be configured to an area before events will appear on the map.

Configuration requires setting rules about the speed a vessel must travel over a specific distance or period of time. There are several reasons you may want to generate this event:

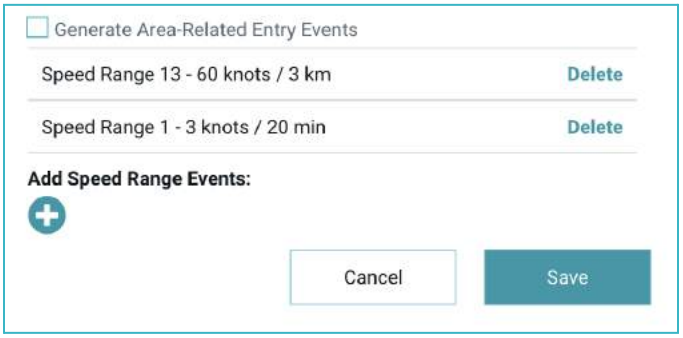
- To monitor vessels traveling above a speed where they are in danger of fatally striking large mammals (e.g. Right Whale migration along the east coast of the United States)
- To monitor vessels that are unlikely to be on "innocent passage" through an area

Look for this icon  to find Speed Range events on the map.

Setting Up a Speed Range Event

Every Speed Range requires choosing a minimum distance **or** minimum time that the vessel must be traveling within a speed range. Examples:

- Vessels traveling significantly faster than 10 knots for several kilometers on the Atlantic coast on AIS are very likely to be breaking speed regulations protecting right whales.
    - Speed Range: 13 to 60 knots
    - Distance: 3 km
- Fishing vessels traveling 1-3 knots for at least 20 minutes could be fishing.
    - Speed Range: 1 to 3 knots
    - Time: 20 minutes
    - **NOTE:** You cannot add limitations like vessel types at this stage. In this example, limiting the Speed Range events to only fishing vessel types happens later through the Filters menu (see section "Getting Alerted to Speed Range Events").



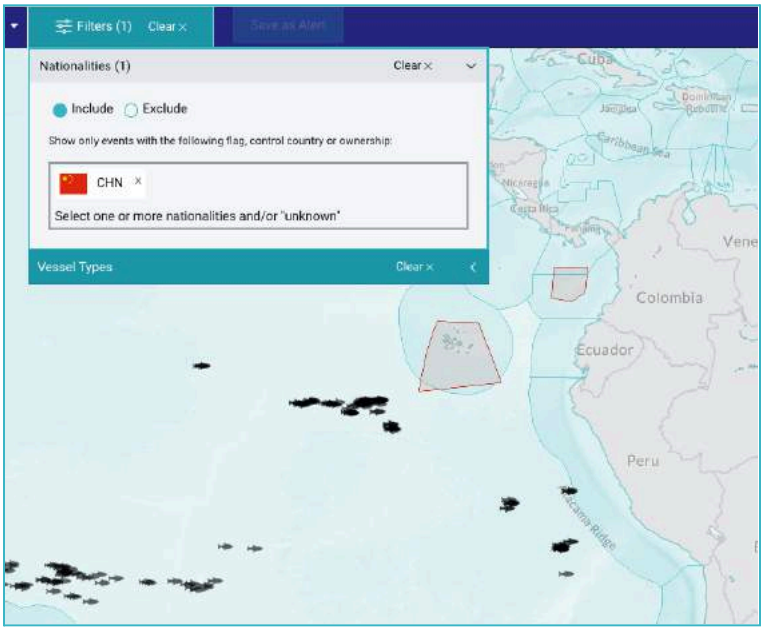
Once the Speed Range settings are saved, events will be generated as soon as the first vessel inside the custom area meets the criteria.

Events: Fishing

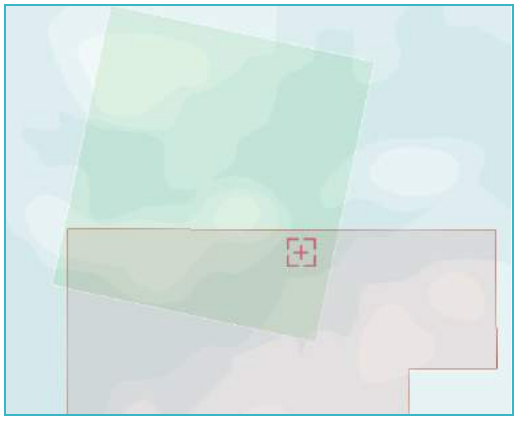
A Fishing Event is generated when fishing behavior is detected in the tracks of an AIS-transmitting vessel. This event uses machine learning based on 4 types of fishing: trawling, longlining, purse seining, and squid jigging. This event is only generated for vessels that transmit themselves as a "Fishing" vessel type on AIS.

Ways to use Fishing Events:

- Monitor foreign vessels fishing at the border of an EEZ (**right** shows Russian-flagged vessel fishing at the edge of the US-Russia border).
- Monitor whether industrial vessels are fishing inside artisanal-only fishing zones.
- Monitor where distant water fleets of specific countries are active (**below** shows likely location of Chinese distant water fishing fleets)



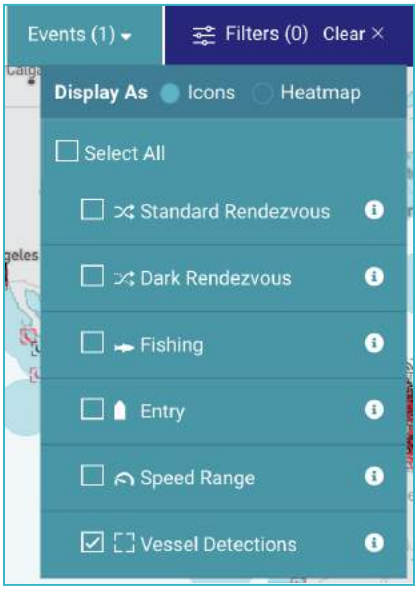
Vessel Detections



In addition to AIS data, Skylight uses other satellite data to capture information about vessels not carrying AIS, called “dark” vessels. “Dark” vessels are not necessarily illegal or nefarious, but they can be helpful for:

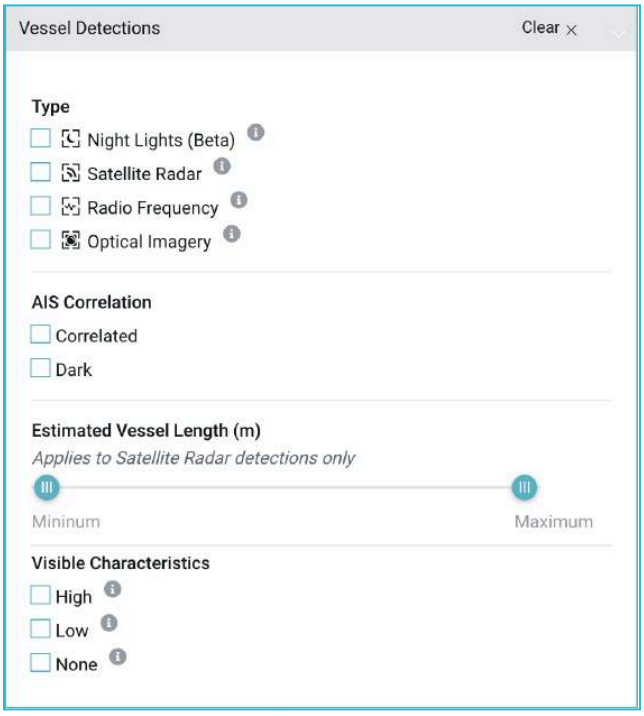
- Identifying fishing fleets
- Identifying vessels potentially conducting abnormal or suspicious activity with their AIS off
- Identifying potential partners in Dark Rendezvous events
- Identifying vessels potentially entering parks or EEZs without authorization

See top right for a scenario where 1 dark vessel may have illegally entered a Marine Protected Area where AIS transmission is required. Cross-checking this detection across other data feeds is necessary to confirm that the entry occurred and it was illegal.



NOTE: No source of “Vessel Detections” allows tracking of vessel movements in real-time. All sources only provide snapshots of where vessels were in the particular moment that the satellite passed the area. That is why all data from these sources are grouped under “Vessel Detections” in the Events menu **(see middle right).**

Skylight has three regular sources for Vessel Detections: **Satellite Radar, Optical Imagery,** and **Night Lights.** These data appear globally without user intervention.

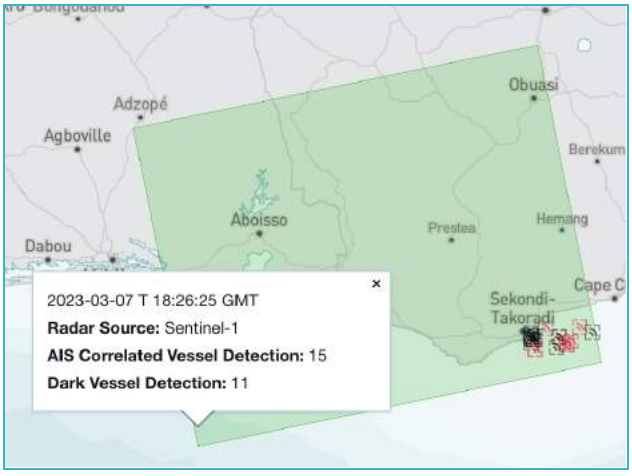


Skylight also has additional sources of Vessel Detections that are only available via request. Specifically **High Resolution Optical Imagery, Radio Frequency,** and additional Satellite Radar.

Satellite Radar

Synthetic Aperture Radar - simply called Satellite Radar - is one way of detecting vessels that do not carry AIS. The icon represents Satellite Radar data.

Vessel Detections from Satellite Radar appear in snapshots that we call “collections”. A collection shows the area that the satellite checked at that point in time. In order to see when a collection was captured, click on the green box **(see right).**



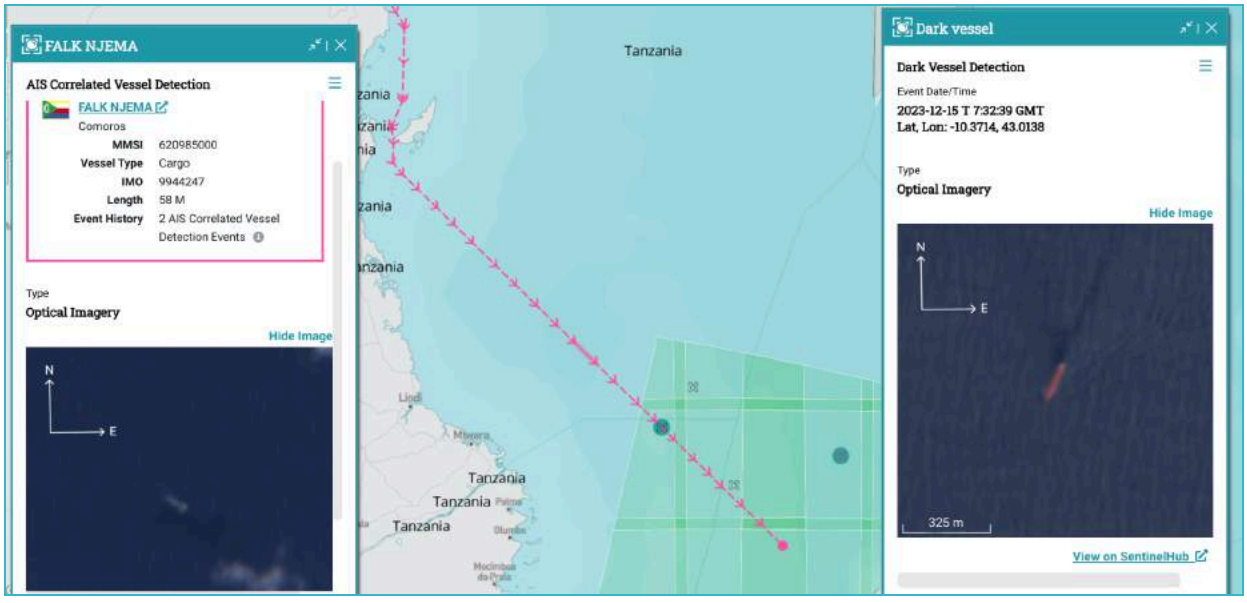
Satellite Radar data is powerful because it can detect vessels despite clouds and even when it is night time. The effectiveness of the satellite depends on the size of the vessel, the material of the vessel, and environmental conditions at that location and time of day.

Today in Skylight, Satellite Radar data is provided on a regular basis for many areas of the world with an average delay of 3-6 hours between collection and delivery. You cannot request these satellites to collect Satellite Radar on a particular day or time; they are on pre-planned schedules outside of our control. These satellites are a great option for regularly monitoring dark vessels.

For more technical information about Satellite Radar data, such as which satellites we use and which areas are covered, please reference our [Knowledge Base](#).

Optical Imagery

As with Satellite Radar, Optical Imagery can detect vessels not carrying AIS. The icon represents Optical data. Collections that have been processed are visible as green boxes.



Optical Imagery is powerful for capturing vessels of many sizes, including those that are quite small, particularly when a wake or bottom disturbance is visible. Today in Skylight, Optical Imagery data is provided for many areas of the world with an average delay of 2 hours between collection and delivery. As with Satellite Radar, these data are collected by public satellites with pre-planned schedules outside of our control.

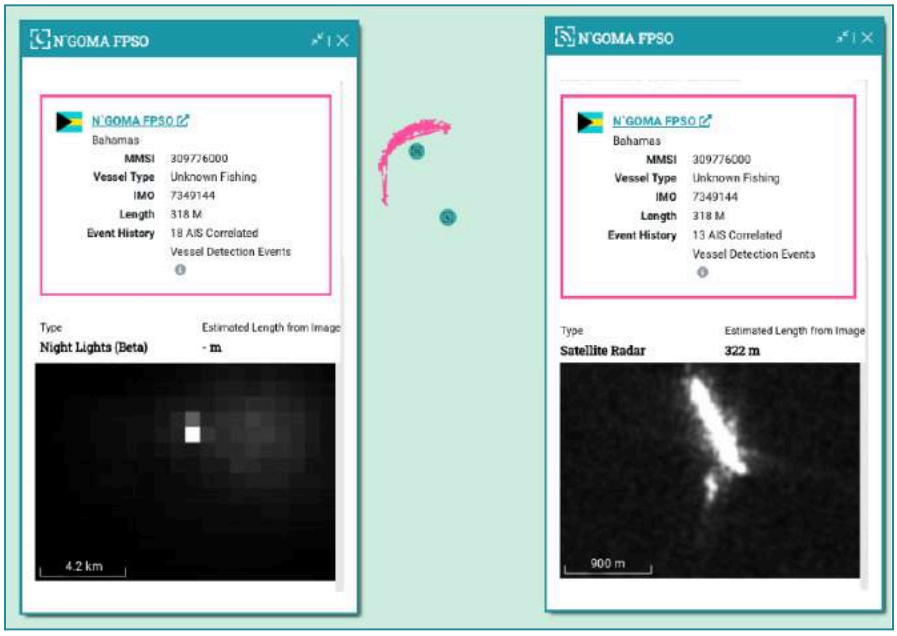
For more technical information about Optical Imagery, such as which satellites we use and which areas are covered, please reference our Knowledge Base.

NOTE: High-resolution Optical Imagery is also available from Skylight's commercial providers, and can be ordered as part of a tip and cue campaign supporting an enforcement outcome.

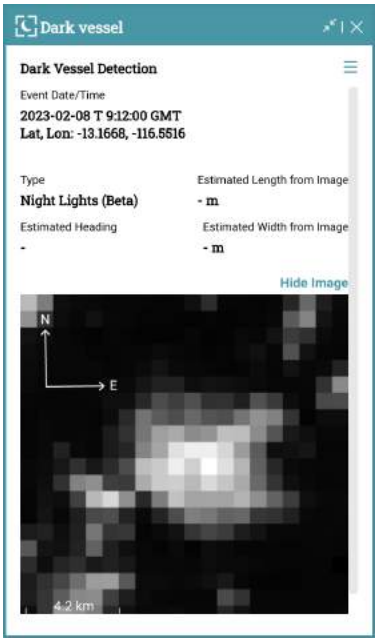
Night Lights

Night Lights are another way of monitoring vessels that may not be carrying AIS. The icon represents Night Lights data. Night Lights are a powerful data source because they can be used to find fishing activity when combined with local knowledge. For example, fishing vessels use lights to attract fish when there is little moon light.

NOTE: Not all lights can be seen from space. The lights must be bright enough and uninhibited by environmental factors like cloud cover and the moon's glow. The image below compares detections from Night Lights (left) and Satellite Radar (right). The Night Lights detection shows a single pixel of light while the Satellite Radar detection shows more detail of the vessel shape.



Today, Night Lights data is provided on a regular basis globally through public satellites using a sensor called Visible Infrared Imaging Radiometer Suite (VIIRS). There is an average delay of 2 hours between collection and delivery in Skylight. You cannot request these satellites to collect Night Lights on a particular time; they are on pre-planned schedules outside of our control.



False positives - calling an object a vessel that is not actually a vessel - are possible. **See right** for an example where the detection is more likely illuminated clouds from moonlight than a vessel's lights. Just like any source of Vessel Detection, click on the detection to analyze the image and check any other sources of data you have available to confirm the detection.

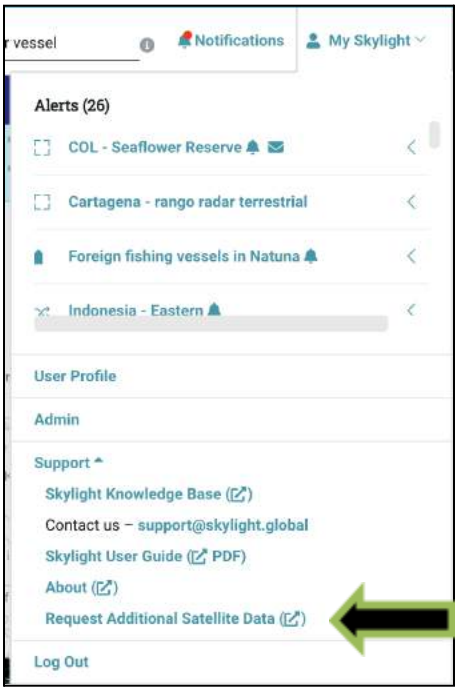
See here for more technical information about Night Lights, such as which satellites collect this data, how we reduce false positives, and how this data in Skylight is different from other platforms.

Requesting Additional Data

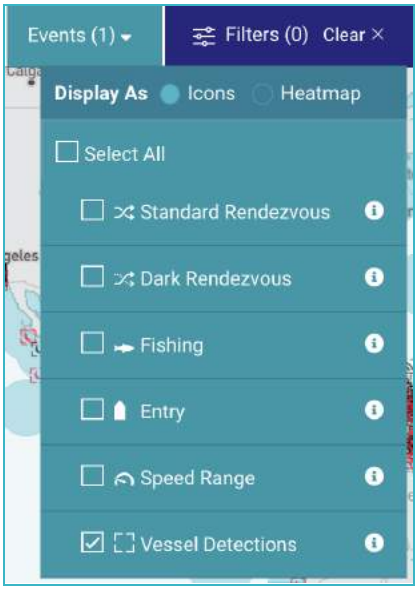
Sometimes the regularly collected vessel detection data does not meet your needs. For example, it does not cover the area you are interested in, or it is not available frequently enough for a specific patrol period. Skylight has the additional option of ordering commercial data for special cases.

Additional data options by request include Radio Frequency, represented by icon, and High- resolution Optical Imagery, represented by the same icon as publicly available Optical Imagery.

To view the special use cases we support for commercial data and instructions on how to make a request, click on the Request Additional Satellite Data link in the My Skylight menu, under "Support" (**see right**).



View Vessel Detections



Select "Vessel Detections" under the Events menu. Change the timeframe to the period where you want to view data. By default, the view is for the last 24 hours. If there was no collection in the last 24 hours in the area you are zoomed in, data will not appear.

Vessel Detections are represented by a square icon.

- Gray colored icons are vessels that have been correlated with an AIS transmission.
- Red icons are "dark" vessels that were not correlated with AIS.
    - **NOTE:** It is possible for "dark" vessels to be transmitting on another system like VMS. Always check other systems you have access to.

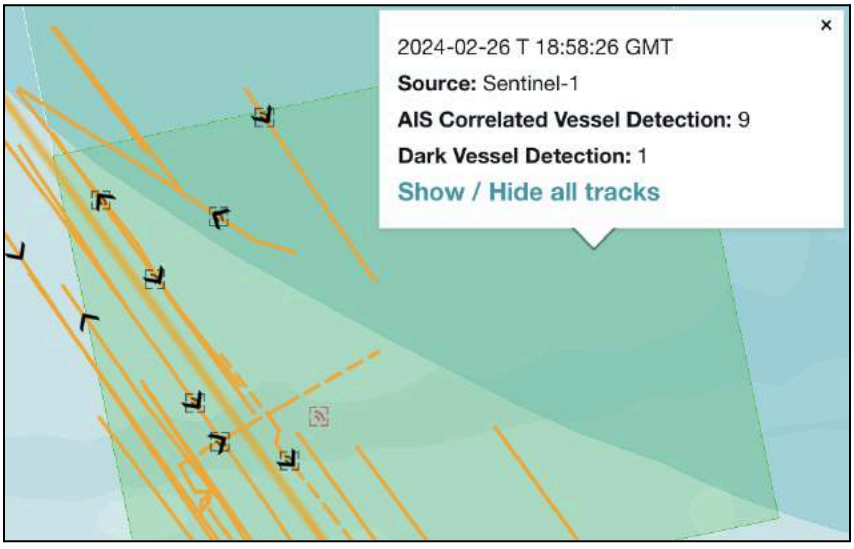
Clicking on a Vessel Detection will open a card that contains a thumbnail of the satellite image and more details about the vessel detected.

Analyze Detections

Skylight offers some additional tools for users analyzing specific detections and collections.

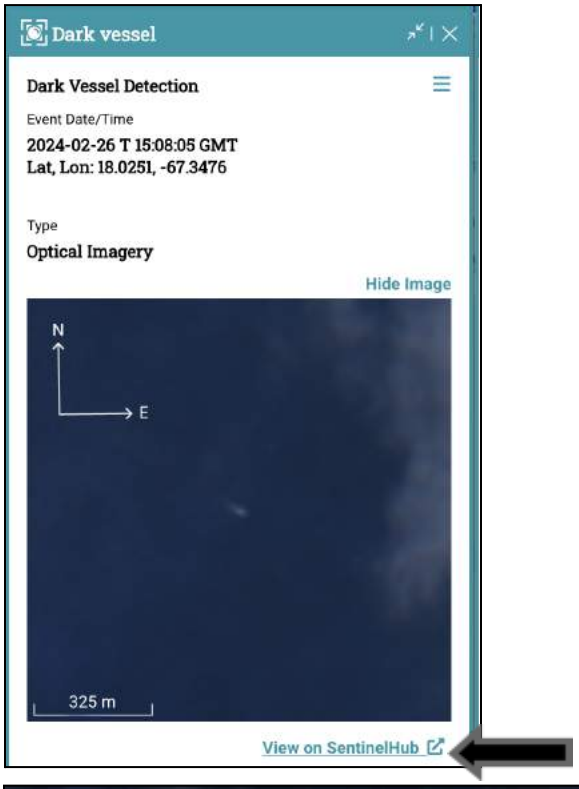
Show/Hide All Tracks

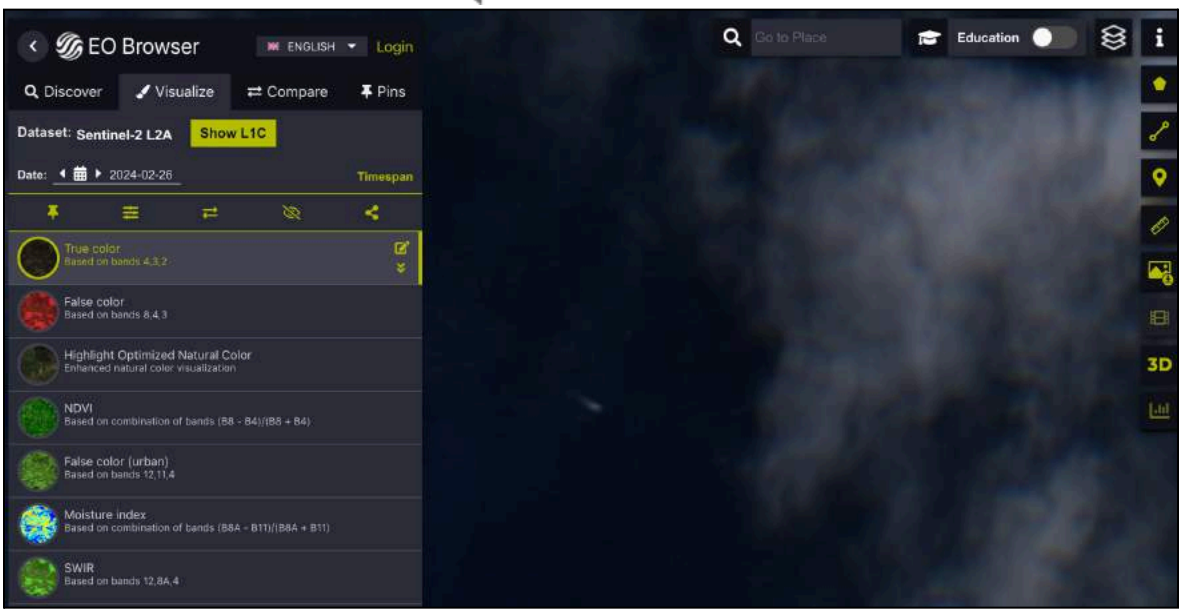
This functionality allows you to view all AIS transmissions during the timeframe when the collection occurred. This is helpful when you have questions like whether there may have been any additional vessels in the area that the collection did not detect, or whether a detection may be dark due to an AIS gap. This option is available when collection areas (green boxes) are visible.



View on SentinelHub

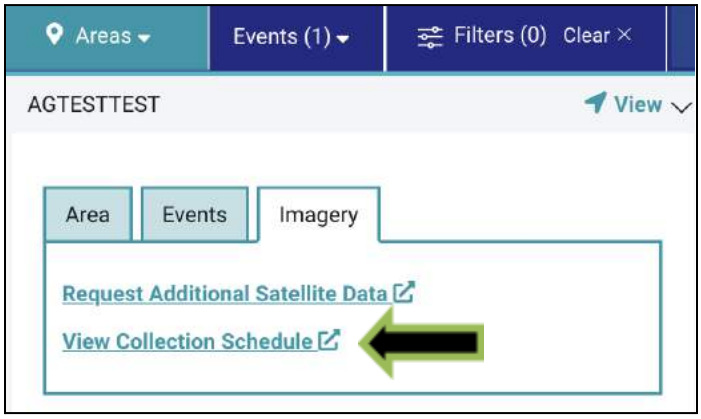
This functionality allows you to see a detection within the full, raw image from which it was processed. This is helpful when you want to see more context of what was surrounding the vessel beyond what is visible in the image chip. This option is available for Sentinel-1 satellite radar and Sentinel-2 optical imagery.





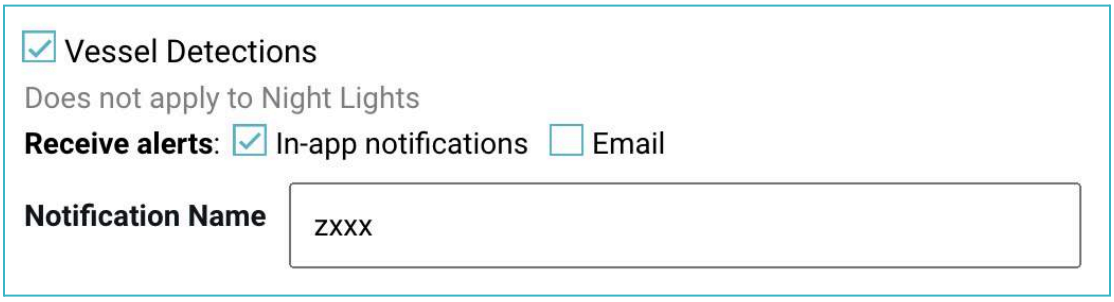
View Future Collection Schedules

Under the “Areas” menu and the “Imagery” tab for any custom area you have created, you can find a link to view future collection schedules for the satellite data collected from public satellites.



Alert for Collections Overlapping With Your Custom Area

In the same way that you can set up alerts for other events, you can set up alerts for Satellite Radar collections overlapping any of your custom areas. See Section “Generate Alerts” for more information. **NOTE:** alerting is not available for Night Lights collections.

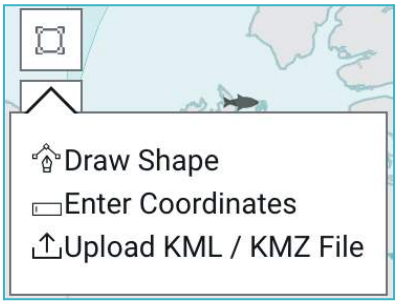


Custom Areas

User-created custom areas are necessary for some functionalities in Skylght :

- Building alerts
- Generating some event types: Entry Events, Speed Range Events
- Making it easy to download information about the same area on a recurring basis

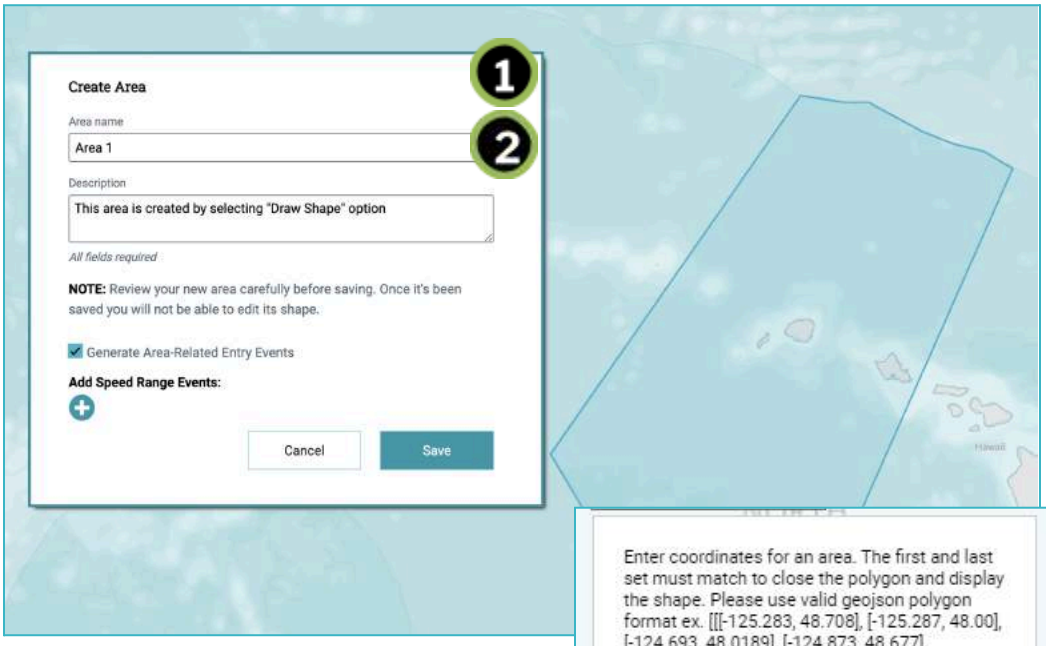
Options for Creating Custom Areas



Go to the Areas Menu on the top left and click on the shape tool at the bottom of the menu ( ). You will see 3 ways of creating a shape: drawing, entering coordinates, or uploading a KML/KMZ file. Any area you create must be a **single, closed polygon.** You cannot add shapes like dots or lines.

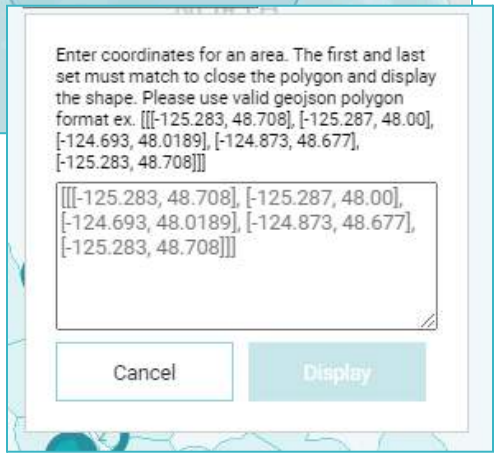
Draw Shape

After clicking on "Draw Shape" start clicking on the map to drop points. When finished, double click to close the polygon. You must add a name before you can save the area.



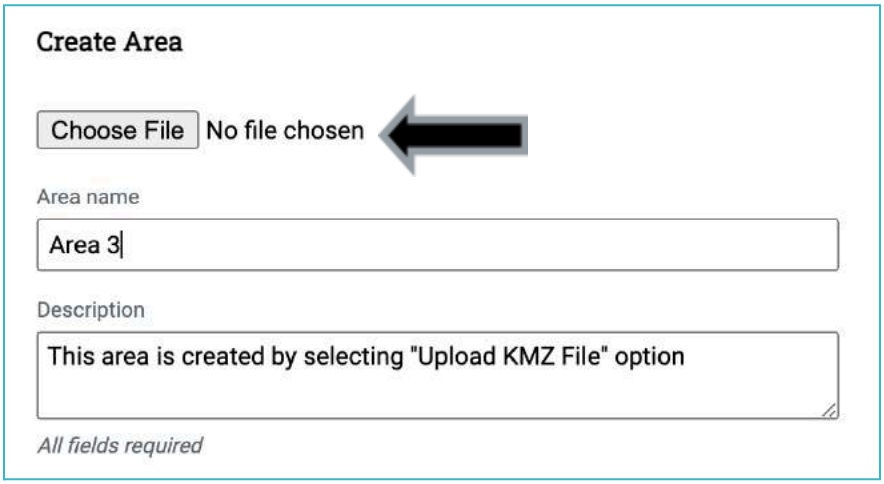
Enter Coordinates

The second option to create an area is typing in longitude/ latitude coordinates in the decimal system. When you are entering coordinates, separate the coordinates by a comma and enclose each pair with brackets like: [7.0001, 7.1234]



The first and last set of coordinates must also match to close the polygon and the entire set of brackets must be enclosed in triple brackets. If the coordinates have been entered correctly,

the “Display” button will become available and you will be able to view your area on the map. Finally, enter the area name and a description to save this area.



Upload KML/KMZ File

The third option for creating an area is uploading a file in KML/KMZ format. Click on “Choose file” to navigate to the file you want to upload. Then fill out a name and description to save the area.

NOTE: The most common reasons that KML/KMZ files fail to upload is that they do not contain a single, closed polygon; or they are not under 20 KB in size (which is a polygon with maximum ~300 points).

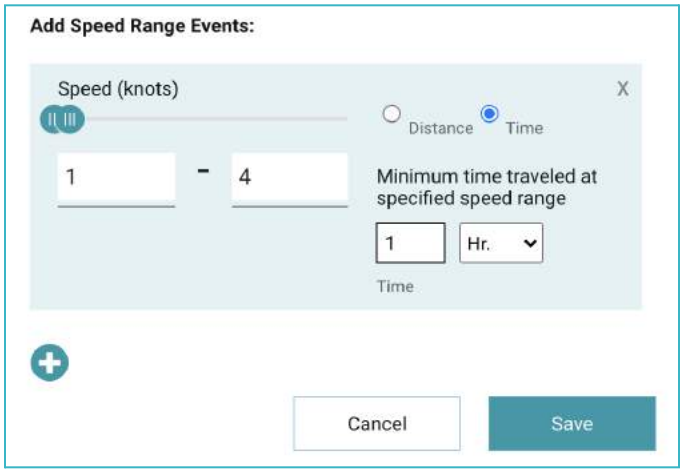
Enabling Entry Events

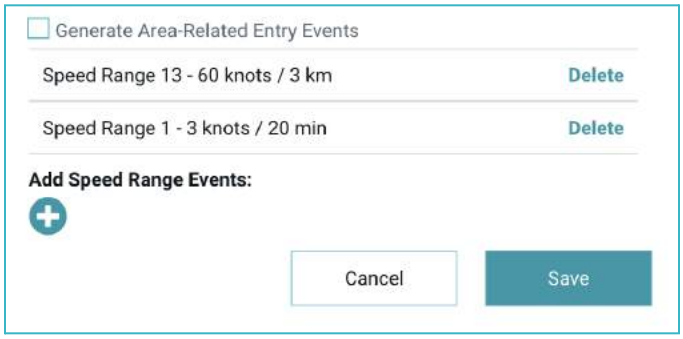
As mentioned in the “General Navigation” section, some event types are generated automatically, while other events need to be configured to an area before they appear. Entry Events are one event that must be configured to an area. Specifically the analyst must create a custom area to monitor vessel entries into that area.

When creating an area, the option to generate entry events for the area is enabled by default. It will take less than an hour for the first set of entries to show. **NOTE:** You cannot enable Entry Events in areas larger than 1 million km^2.

Enabling Speed Range Events

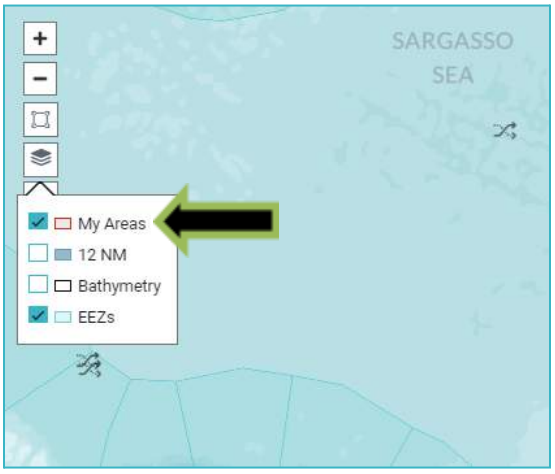
Speed Range Events are another event type that must be configured to an area before they appear on the map. When creating a custom area, you will see the header “Add Speed Range Events” where you can click on the plus icon ( ) to configure. Use the radio button to set your speed range preference by Time or Distance. See Section “Events: Speed Range” for guidance on this. It is possible to set multiple Speed Range Events for one area.





Viewing Custom Areas

Once you have created your custom area, you will be able to view it on the map. Go to layers ( ) on the left-side menu and make sure “My Areas” is activated to view all of the areas you have created.



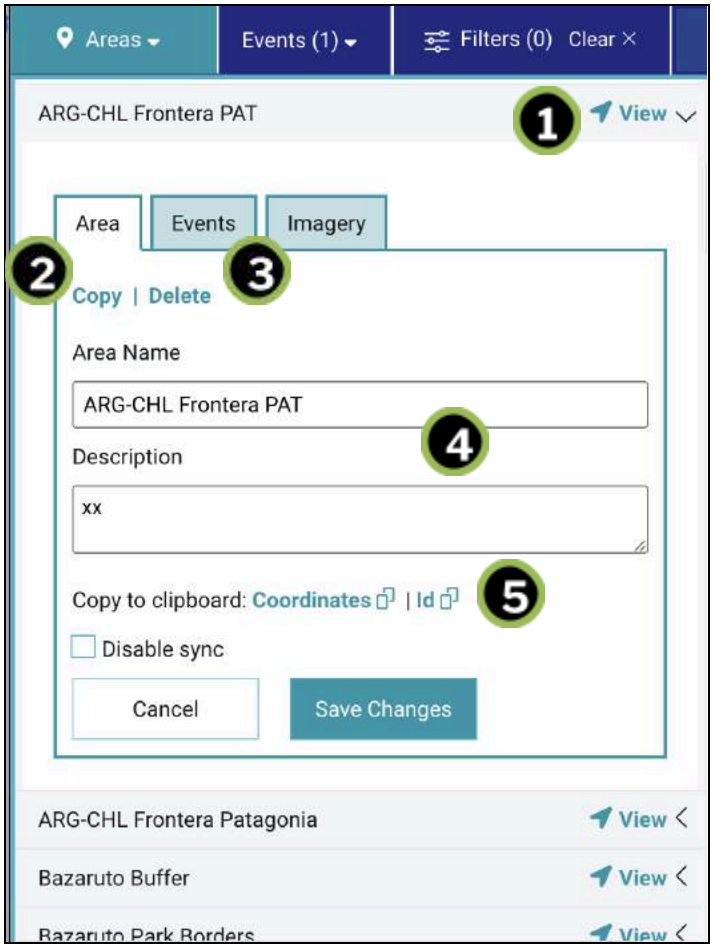
Managing Custom Areas

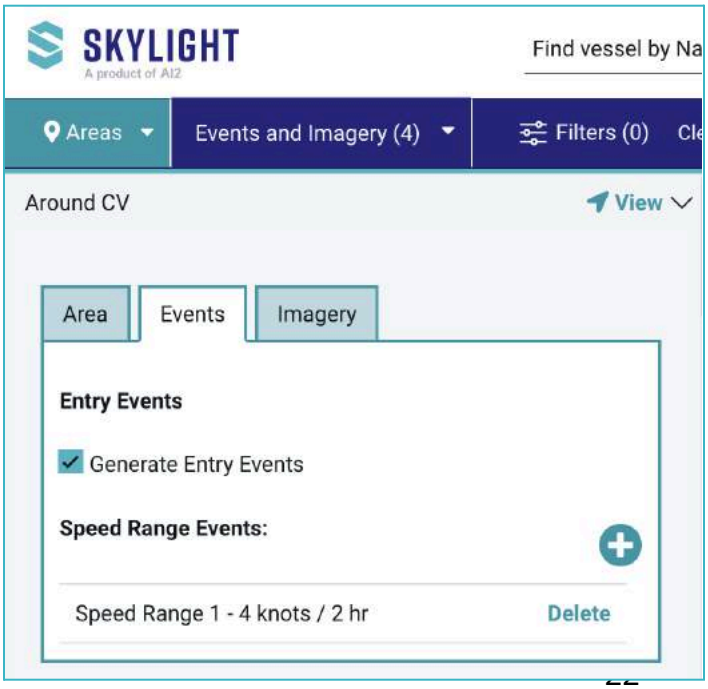
To see a list of the areas you have created, click on the Areas Menu on the left corner of the menu bar.

Clicking on the < arrow will expand the settings. Under the 'Area' tab, you can:

1. Click "View" to go to the area on the map and select it.
2. Click "Copy" to create a clone of the area. This option is useful if you would like to change the boundaries of an existing area to create a new area.
    a. **NOTE:** You will not see the copy option for an area originally created by KMZ/KML file upload.
3. Click "Delete" to remove the area from your map layer and all area-based events associated with that area (e.g. historical Entry and Speed Range events).
    a. **NOTE:** If an area is being used in an Alert, the system will block you from deleting the area. Follow the prompts to delete the associated Alert and after that you will be able to delete the area.
4. Edit the name, description of the area
5. Copy "Coordinates" to copy the area coordinates to your clipboard.
    a. This is useful for sharing areas with other Skylight users. If you paste the coordinates into a text file and send it to them, they can recreate the same area as you with the "Enter Coordinates" method.
    b. Copying "Id" is useful for API users.

From the "Events" tab, you can add or delete area-based events, specifically Entry and Speed Range Events.





Information about the “Imagery” tab is explained previously in the section “View Future Collection Schedules”.

View Vessel Tracks Behind Events

Tracks display automatically after clicking on an event. They are provided for the 48 hours before and 48 hours after an event occurs. Tracks can help better analyze an event, such as:

- Helping determine whether a Dark Rendezvous Event truly captured a transshipment or was more likely a false positive
- Examining whether a fishing vessel may have fished just before transshipping with a Fish Carrier/Reefer in a Standard Rendezvous Event
- Seeing if there were gaps in AIS transmission after an Entry Event, suggestive of non-authorized vessels operating in the area

Use your mouse or the left-side tools to look at different parts of the vessel(s) tracks. You can also hover over some points in the vessel tracks to see the time, estimated position, and speed of the vessel at that time. These points are marked with an arrow () symbol.

NOTE: Not every AIS position transmitted by a vessel is marked with the arrow symbol (). When a vessel has been traveling at the same speed and direction, Skylight merges repeated points in the middle so the arrow is only visible at the start point and end point of that track segment.

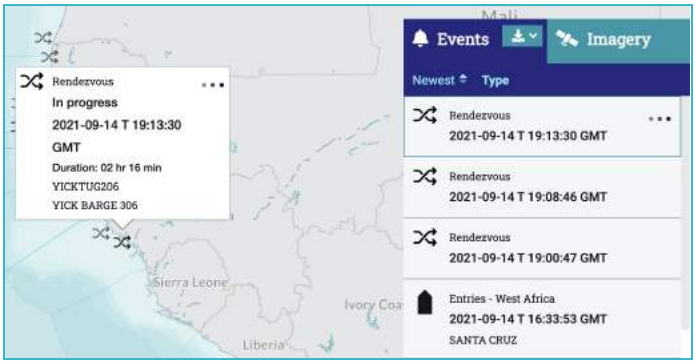
The tracks view will provide you with:

1. **Speed** – Visualize how fast a vessel was traveling by hovering over a segment.
2. **Direction changes** – The arrow () indicates the Course over Ground (COG) of the vessel. COG comes from GPS and shows the direction the vessel is actually moving. **NOTE:** COG is different from Heading, which is the direction the vessel is pointing. Heading and COG are often different.
3. **Gaps** – Shaded line between segments indicates gaps in AIS transmission > 2 hours.
4. **Position details** – Hovering over an arrow () displays the vessel’s position at that time. Clicking onto the arrow will “freeze” the box so you can copy the information.

Finding "In Progress" Events

A key differentiator between Skylight and other maritime tools is that Skylight generates events very close to real-time. An event marked as *'In Progress'* indicates that the event is likely still happening, which is extremely helpful for taking action in real-time. For example, an In-Progress Rendezvous Events indicates that according to the last transmissions by the participating vessel(s), the transshipment is still occurring.

'*In Progress*' events have three circles (•••) next to the event in the Event List and in the text that shows when hovering over an event on the map.

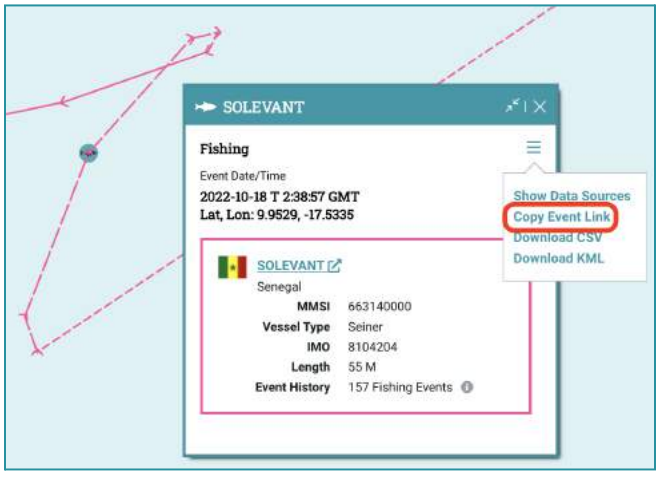


Sharing and Downloading Skylight Data

Share an Event with Another User

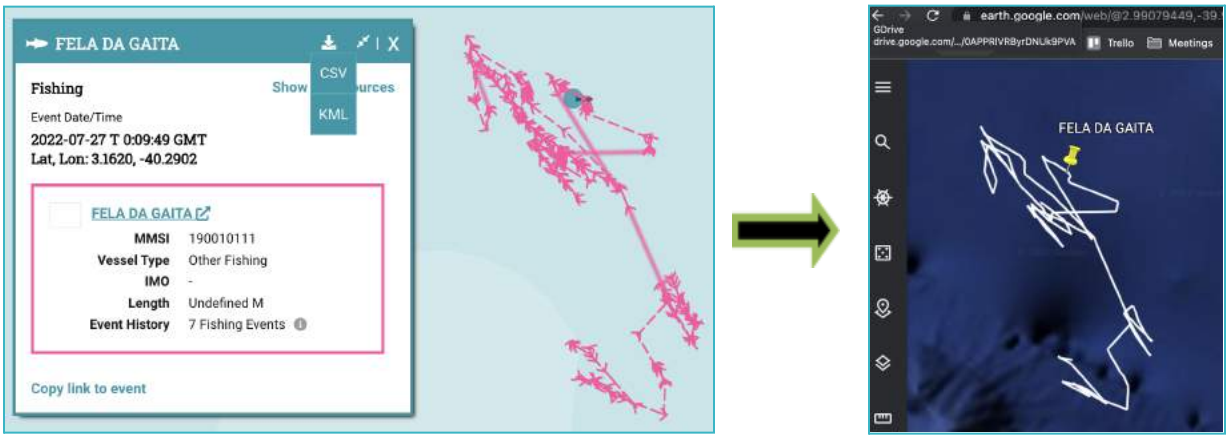
Click on the three bars in the top right of an event detail card to see the "Copy Event Link" button **(see right).** This will copy a link that can be pasted in email, WhatsApp, etc. to view the event in another browser. Anybody using the link must have a Skylight account. They will also be asked to log-in if they are not already logged in.

NOTE: Event sharing is not currently supported for "Entry" and "Speed Range" events.



Download Tracks for a Specific Event

Download information about single events from the Event Details card. This is helpful for visualizing events from Skylight on other systems. Downloads are available in CSV or KML format. Only KML file format includes vessel track data.



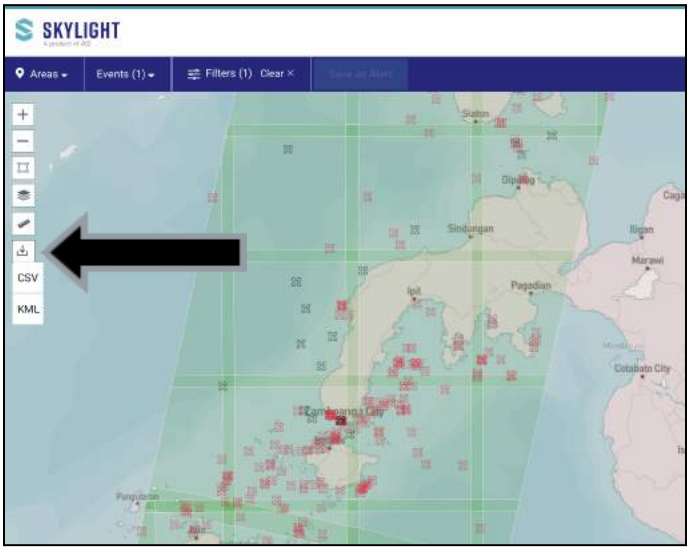
Download Multiple Events At Once

Download events that appear on the map in CSV or KML formats. This will include all of the events as point data (download does not include tracks). Some use cases this helps with:

- Listing all vessels who have entered a port, park, EEZ, or other Custom Area
- Creating monthly reports of potential transshipment activities
- Conducting network analysis for regional rendezvous activities
- Viewing Skylight events alongside other MDA softwares.
- Adding contacts of interest to patrol plans for ships and/or flights.

Steps to download events on the map:

1. Zoom into your area of interest.
2. (Optionally) Apply any filters you would like to take into account. E.g. time frame, choosing only entry events, vessel nationalities
3. (Optionally) Click on a custom area to limit events that have occurred only inside that area.
4. Choose between CSV and KML to download from the Event List (see right)



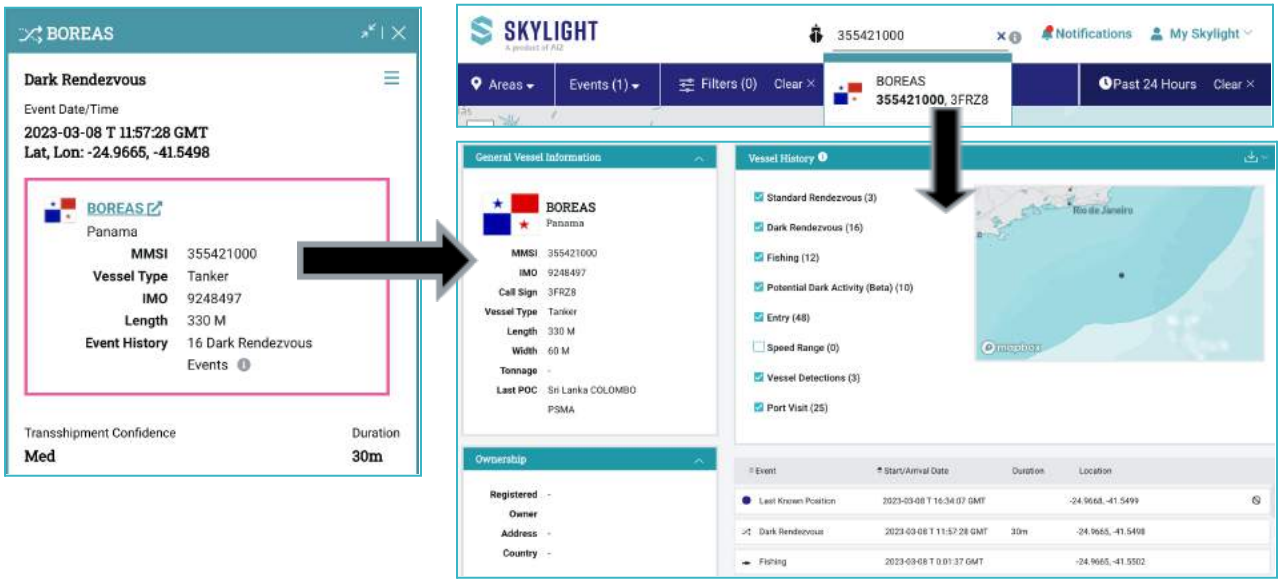
An example of a downloaded CSV file:

Event Type	Start Time	Event Location Lat	Event Location Lon	Vessel Name	Vessel Name Source	MMSI	MMSI Source
Fishing	2022-07-26T19:01:59Z	0.14733	-47.928221666666666	ECOMAR 18	AIS	700083510	AIS
Fishing	2022-07-26T19:08:43Z	4.975948333333333	-4.190155	SEASPAN LOGA	AIS	477308400	AIS
Fishing	2022-07-26T19:08:50Z	-3.7052	-38.48425	WS VIRGO	AIS	710005530	AIS
Fishing	2022-07-26T19:17:39Z	5.592836666666667	0.007666666666666666	Unknown		627230000	AIS
Fishing	2022-07-26T19:21:21Z	6.030513333333333	1.2723633333333333	STELLA ISLAND	AIS	356136000	AIS
Entry	2022-07-26T19:21:41Z	19.216161666666668	-20.393213333333332	TOROS-M	AIS	355851000	AIS
Entry	2022-07-26T19:21:41Z	19.216161666666668	-20.393213333333332	TOROS-M	AIS	355851000	AIS

Download the Activity History of a Vessel

Activity history of vessels can also be downloaded in CSV or KML formats. Steps to download vessel history:

1. Search for a vessel or click on the vessel name from an event card.



2. Use the icon on the top right to download the vessel history in CSV or KML format.

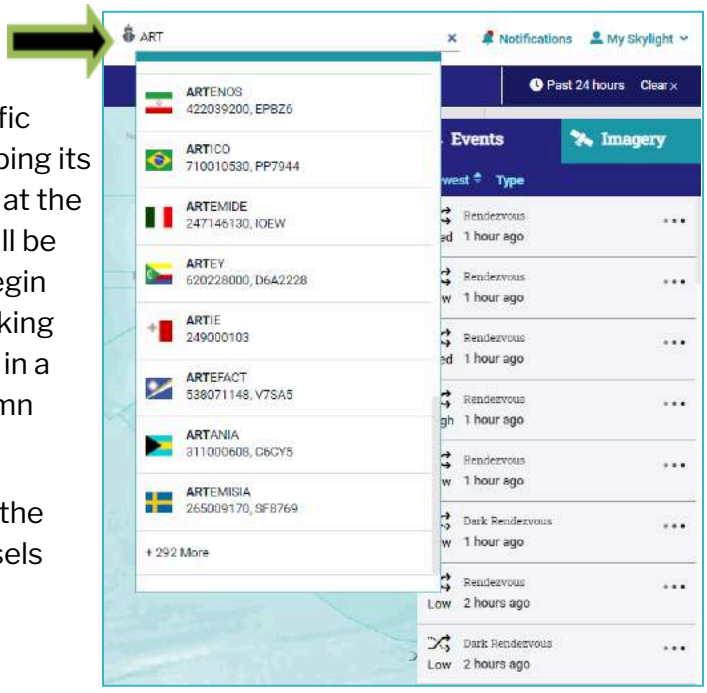
An example of a downloaded CSV file:

Event Type	Start Time	Event Location Lat	Event Location Lon	Vessel Name
Port Visit	2020-12-21T19:57:35Z	12.119668006896973	-68.91633605957031	ARTEMIS
Port Visit	2020-12-22T13:39:39Z	12.11970043182373	-68.91631317138672	ARTEMIS
Entry	2020-12-26T00:00:19Z	25.02523422241211	-79.5106201171875	ARTEMIS
Port Visit	2020-12-26T05:25:04Z	26.070432662963867	-80.11509704589844	ARTEMIS

Searching for Specific Vessels

If you are interested in information about a specific vessel, you can search for a vessel's record by typing its name, MMSI, IMO, or call sign into the search bar at the top of the platform. A list of potential matches will be displayed in a drop down menu as soon as you begin typing. Scrolling to the bottom of the list and clicking the "More" link displays a list of all search results in a separate page where they can be sorted by column headers.

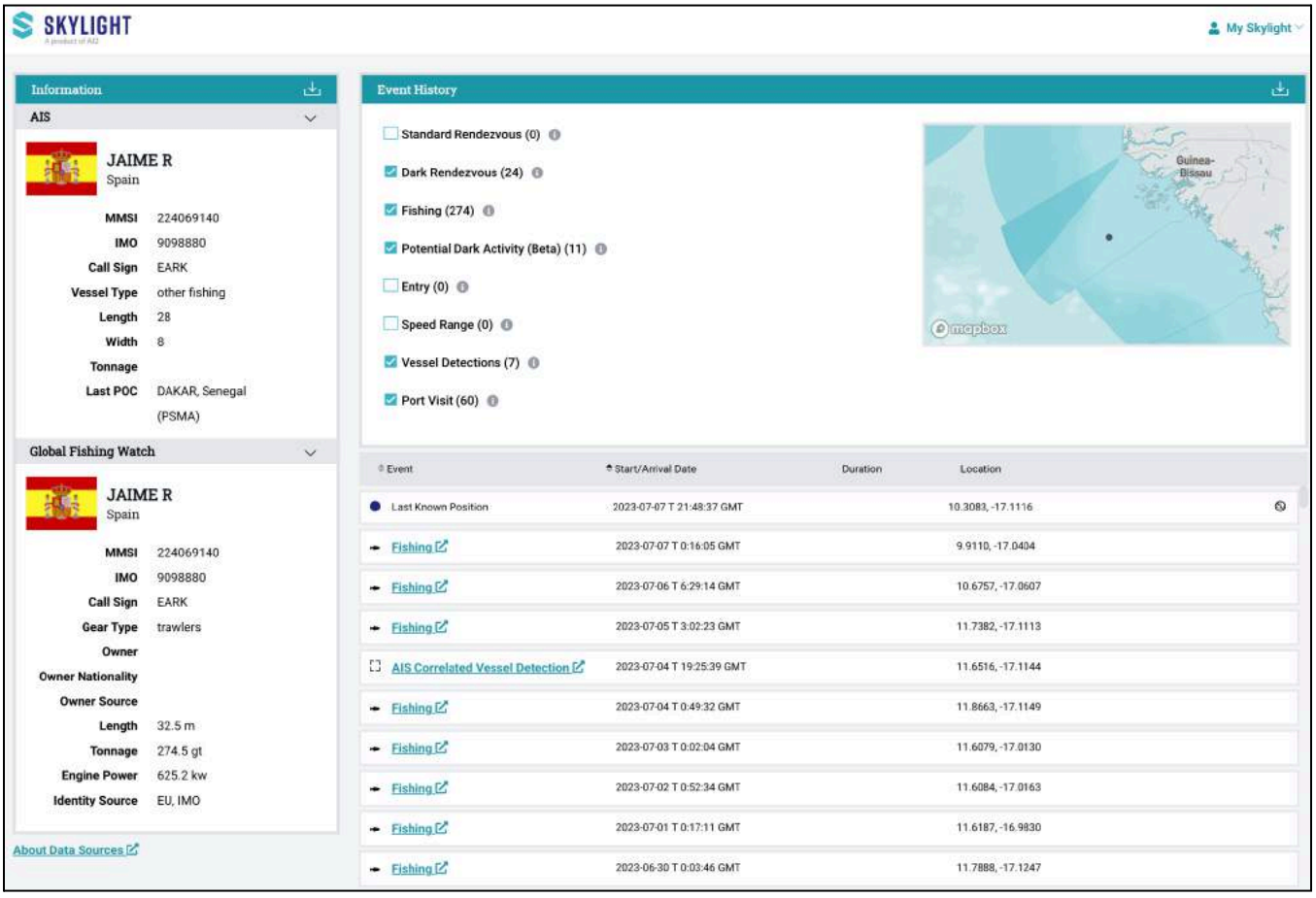
NOTE: This feature only allows you to search for the vessel record and does not search for those vessels among events on the map.



Vessel Details

Vessel Details pages contain all of the information Skylight has collected about specific vessels.

- **Left side:** Vessel information on the left-hand side
  - These data come primarily from what the vessel is transmitting on AIS
  - When available, additional information from Global Fishing Watch is displayed here
- **Right side:** A summary of the vessel's activities in chronological order
  - By default it includes all events recorded for that vessel and all Port Visits
  - Last Known Position is the most recent location we have for that vessel
  - The mini map on the top right updates when you click on a row in the Activity History
  - Clicking on an event will open the tracks for that event on the main map

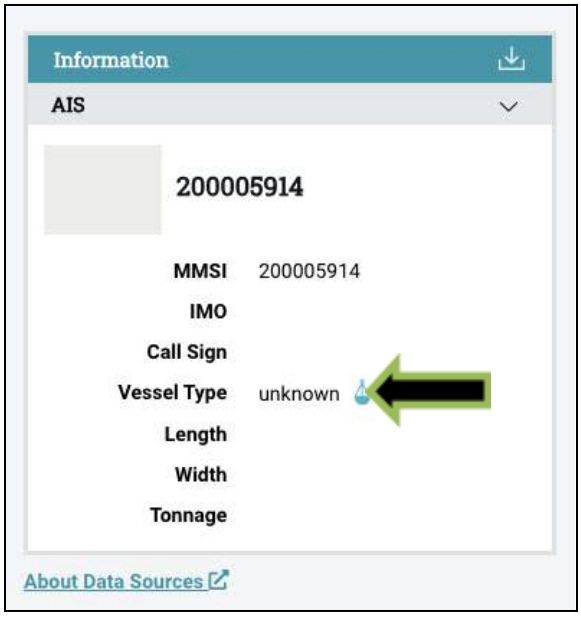


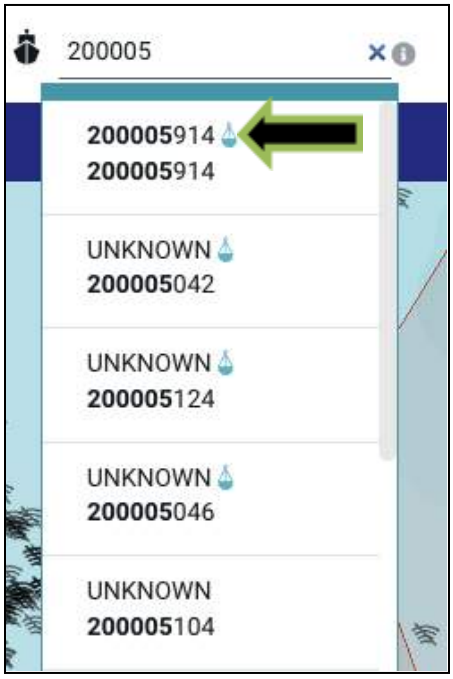
NOTE: Historical event data is generally available for 18 months. An exception is area-based events, like Entry Events and Speed Range Events, which start from the time the user enabled the area for those event(s).

AIS Use by Non-Vessels (e.g. Equipment, Buoys)

Sometimes AIS transmitters are affixed to equipment and transmit on the same channels as vessels which can create confusion. There is nothing explicit in these AIS messages that make it clear the transmission is coming from equipment, which is why Skylight runs its own models to try and separate AIS transmissions from non-vessels from vessels.

If Skylight's model believes the transmissions are coming from non-vessels, such as buoys or fishing equipment, the vessel details page and the search results will be marked with a buoy icon.



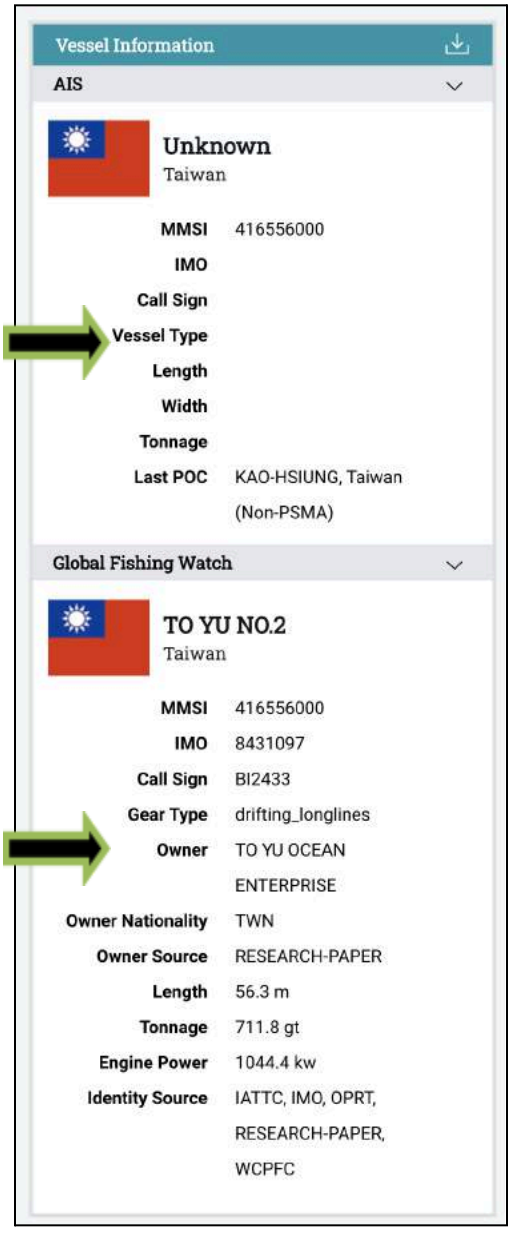


Vessel Data from Global Fishing Watch

Global Fishing Watch (GFW) provides data about commercial fishing and support vessels by synthesizing more than 30 public vessel registries each month to develop a comprehensive database of known vessel information. When this data is available for a vessel, Skylight will display that supplementary information on the vessel details page.

GFW data is particularly helpful when:

- A vessel is missing its vessel type or has an ambiguous vessel type in AIS, but there is additional information through Global Fishing Watch **(see right)**
- You are interested in ownership information about a commercial fishing or support vessel
- You want to see if there are discrepancies between what a vessel is transmitting on AIS and what has been collected by public registries



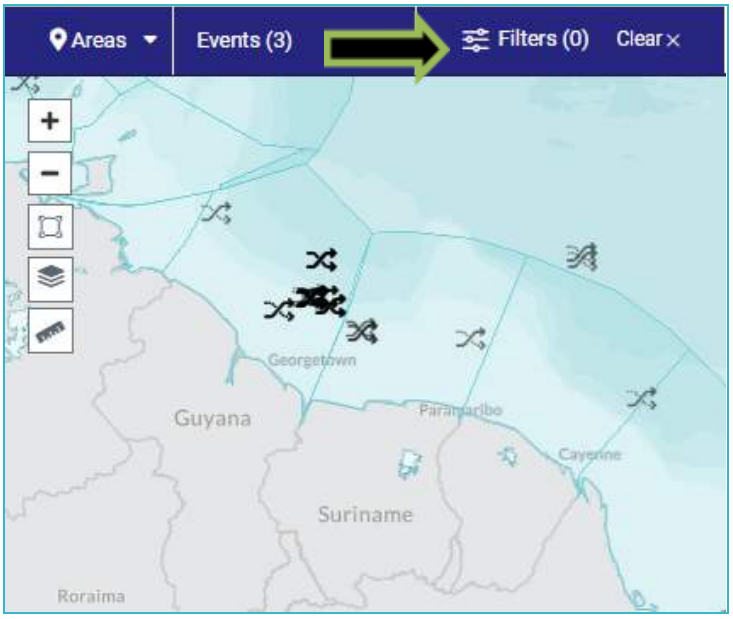
It is possible for there to be multiple records in Global Fishing Watch matching the same vessel. Skylight uses a combination of MMSI, Name and IMO to look for matches in the GFW database. When there are multiple records, there will be a page button to scroll between records **(see below).**

NOTE: Global Fishing Watch data is not provided through the Skylight API. It must be accessed through our interface, downloads from the interface, or directly from GFW.

Filtering by Event Characteristics

Filters are useful for narrowing down the events visible on the Skylight map to those that are particularly interesting. Some common examples include:

- Excluding entries by local vessels
- Looking for potential bunkering activity between fishing vessels and refueling vessels
- Displaying all events that occurred in a region for the past month



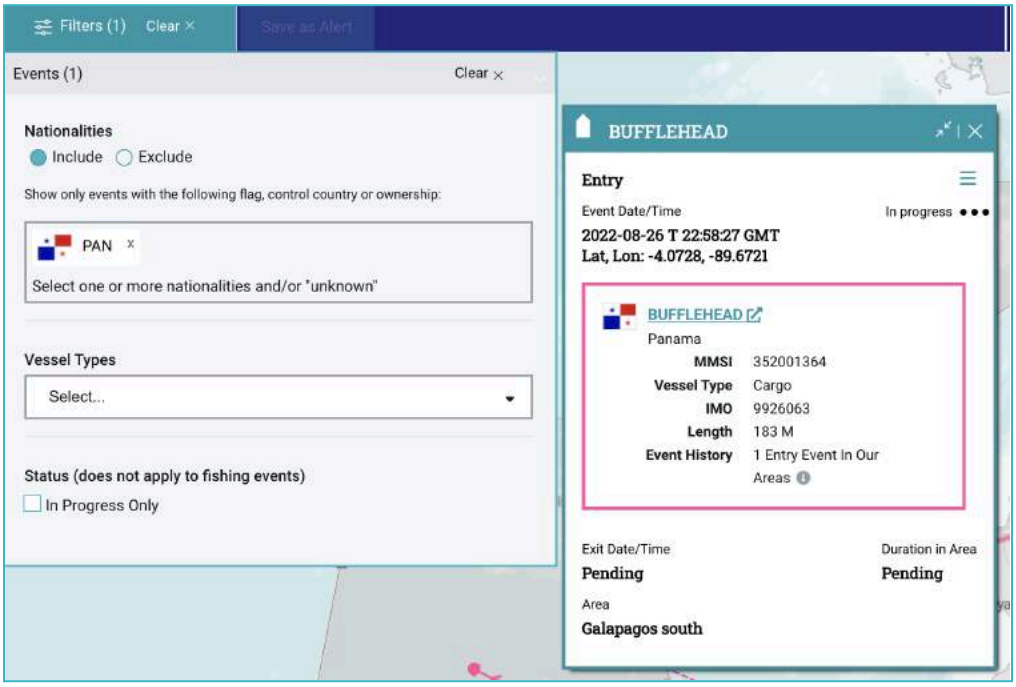
Filters are accessed by clicking on the Filters button on the top bar. The number beside the filter name references the number of filters being applied in the current view.

Some filter options are only available for Rendezvous Events or Entry Events, but not both. The filter will only show categories applicable for the event type you selected from the "Events" dropdown. First, we will walk through the filter options available for all events.

Filters for All Events

Nationality

Filtering by nationality looks for vessels affiliated with that country according to their Flag Country, Control Country (CC), or Owner Country. This filter encompasses all vessels affiliated with the nationalities selected as determined by Flag Country, Control Country (CC), or Owner Country. Adding country names to this filter will return events in which at least one of the participants is affiliated with the selected nationalities across any of those fields. In the example below, this alert



would display if the nationality selected was Panama OR Netherlands.

NOTE: Flag Country is based off what the vessel is transmitting on AIS. The first three digits of an MMSI number is a code that maps to specific countries. More information is available here. It is possible for vessels to transmit different flags than where they are registered because they have not updated their AIS.

Additionally, you can include multiple countries in the nationalities filter, filter specifically for vessels that do not have a proper nationality ("unknown"), and choose to include or exclude alerts based off of Nationalities.

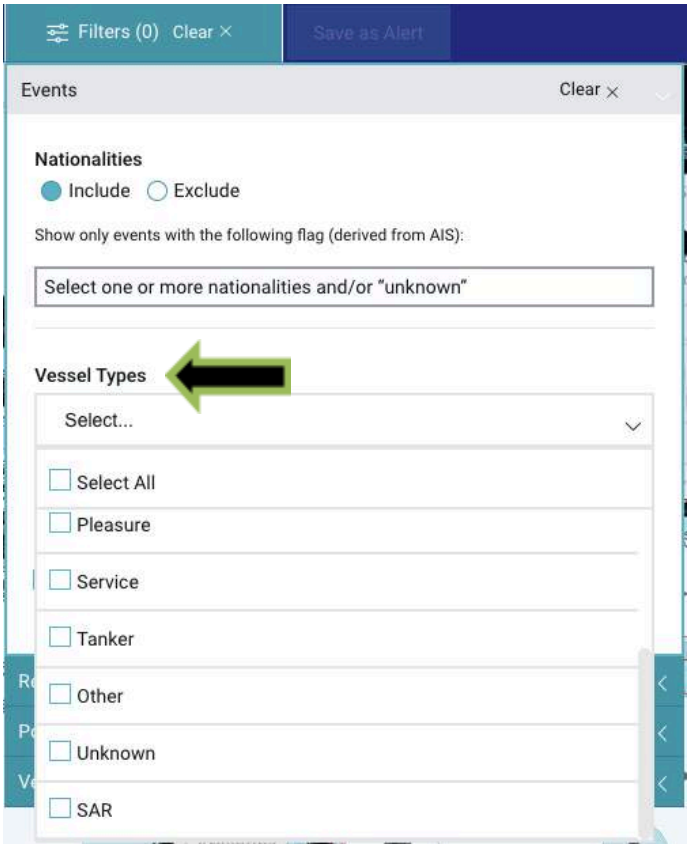
Vessel Types

Vessel type is determined through AIS transmissions and supplemental data when available. We use fields like MMSI, call sign and IMO to match vessels from AIS transmissions to external metadata.

The filter will limit events to whichever vessel types are selected. It is often easiest to start with “Select All” and remove vessel types that are not of-interest.

For Standard Rendezvous events, selected vessel types may appear for either position/vessel. For Dark Rendezvous events, the vessel type conditions are only to the “known” vessel transmitting AIS, not the possible rendezvous partners.

The table below summarizes all vessel types captured in the platform.



Vessel Type	Description
Cargo	All cargo types
Enforcement	Vessels engaged in military operations, search and rescue, law enforcement vessels, and fishery patrols
Fishing	Fishing vessel types
Passenger	Passenger vessels (e.g. cruise ships, ferries, etc.)
Pleasure	Pleasure craft (e.g. sailing, yachts, etc.)
SAR	Search-and-rescue vessels
Service	Anti-pollution, dredging, offshore supply, pilot, tender, towing, and tug vessels
Tanker	All tanker types
Other	Diving, HSC, Medical, NAC, Spare, WIG, and other vessel types classified under Ship
Unknown	Vessels not contained in our database or transmitting a vessel type

Combining Filters

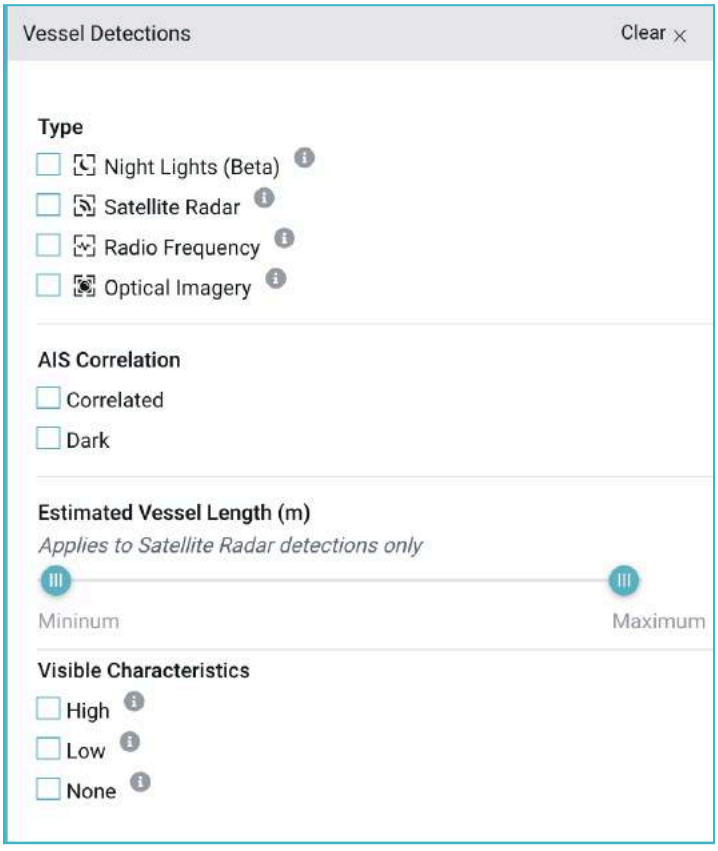
Filters can be used alone or in combination with other filters.

1. Multiple selections within the **same** filter type will be treated as an 'OR'.
    a. For example, if a user selects the checkbox next to Fishing and Fish Carrier options under Vessel Types, alerts will be filtered to display rendezvous events where at least one of the participants is a Fishing vessel or a Fish Carrier.
2. Selecting filters **across** filter types will be treated as an 'AND'.
    a. For example, if a user selects Vessel Type as Fish Carrier and Nationality as China, alerts will be filtered to display rendezvous events where at least one participant is Chinese-affiliated **and** at least one vessel's type is Fish Carrier.

Filter Vessel Detections

All Vessel Detections can be filtered by

- The type of data
- Whether the detections were correlated with AIS
- How much the data type provides visible characteristics
    - High: these sources can help locate small vessels, types of medium and large vessels, and possibly identify large vessels
    - Low: these sources can help locate medium vessels, possibly identify type of large vessels
    - None: these sources determine vessel presence only, no idea of type of size



Vessel Detections from Satellite Radar can be additionally filtered by

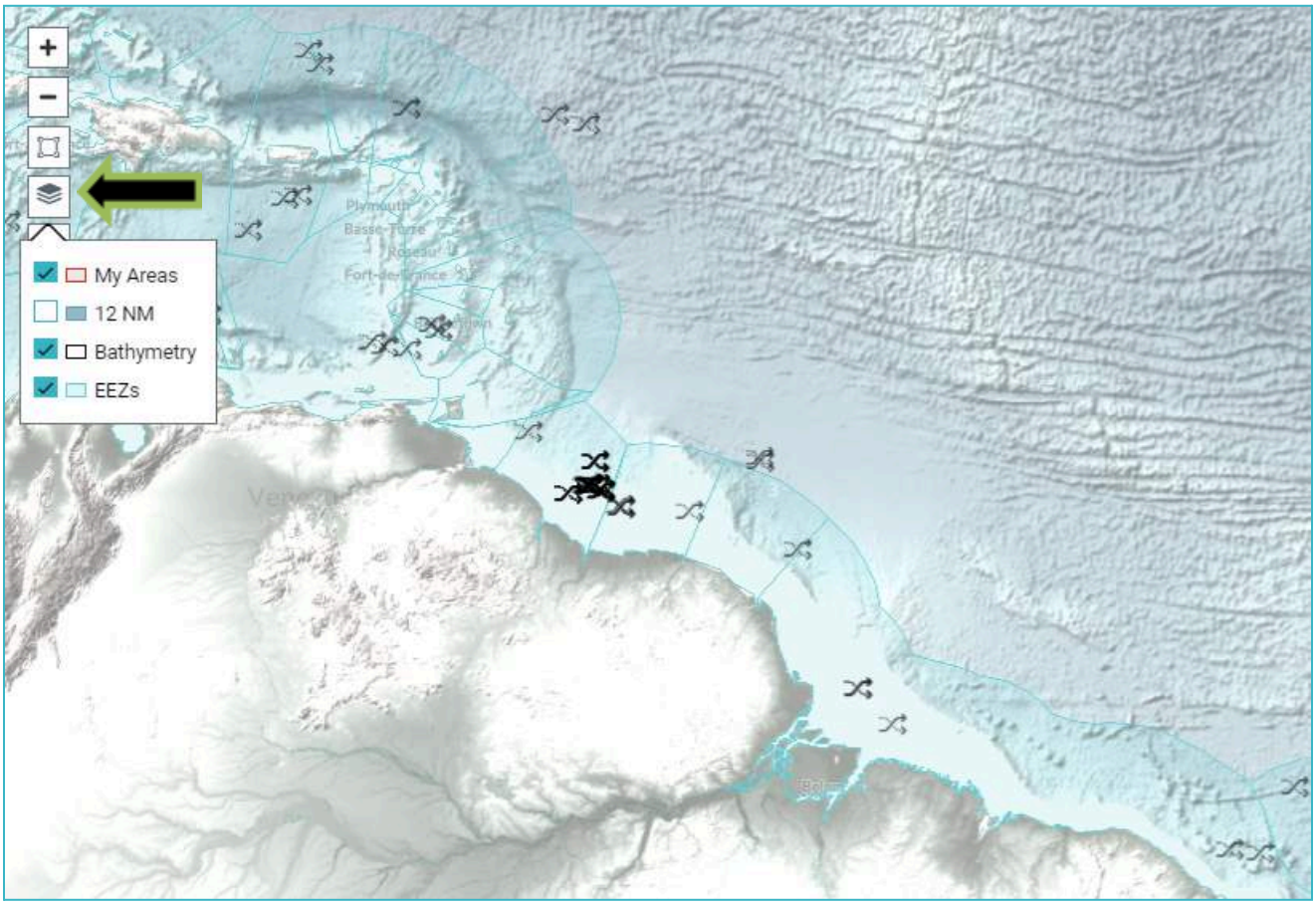
- The length of the vessel, estimated from the image.

Adding Map Layers

Skylight provides some layers, by default, to help analyze alerts. Toggling these layers on and off can help you understand whether an alert is happening inside or outside important boundaries. Click on the Layers icon ( ) on the left-hand toolbar to view these options:

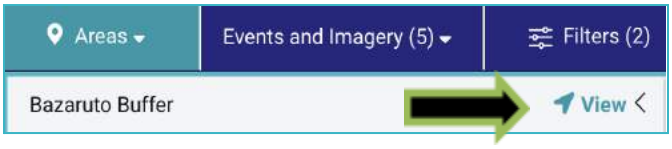
- My Areas: Custom areas you created
- 12NM: 12 Nautical Mile, usually Territorial Seas Boundary
- EEZs: Exclusive Economic Zones
- Bathymetry: Displays the depth of the water **(see below)**

See here for more information about these layers, including the sources that we use.



Filtering by Area

Restricting the events you are seeing on the map to an area is useful when you want to set up an alert and when you want to download only the events occurring inside that area.

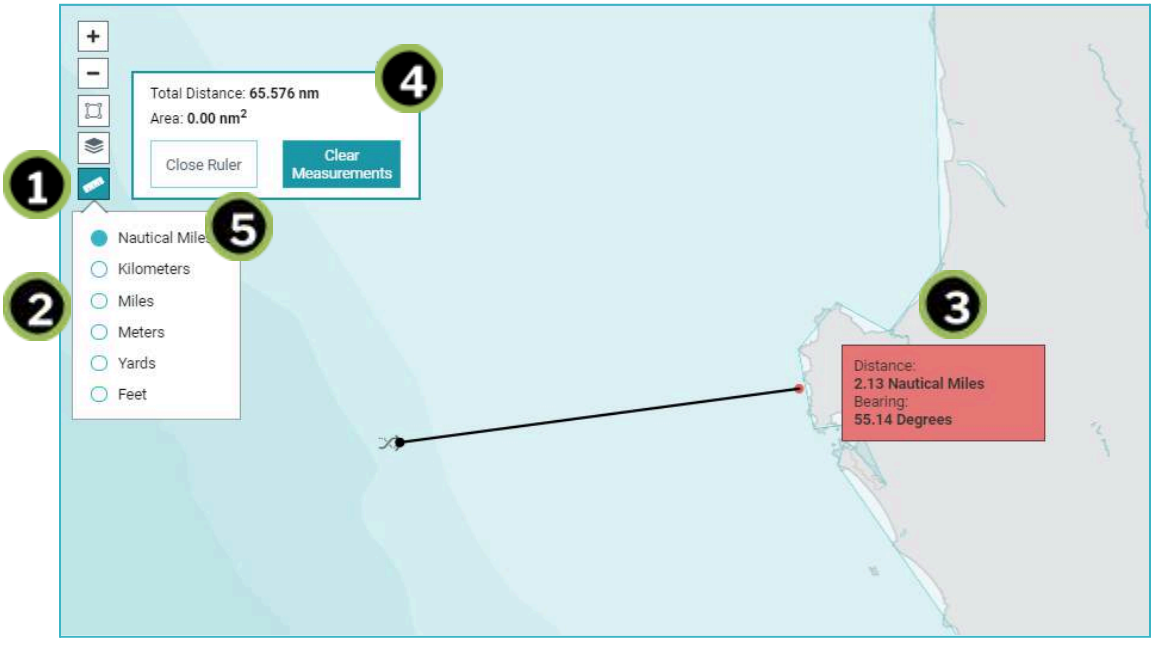


You can restrict events to inside map layers (e.g. EEZ, 12NM) by clicking on the map layer. You can also restrict events to Custom Areas by clicking on your Custom Area in the map or clicking on “View” next to your Custom Area in the Areas Menu.

Measuring Tool

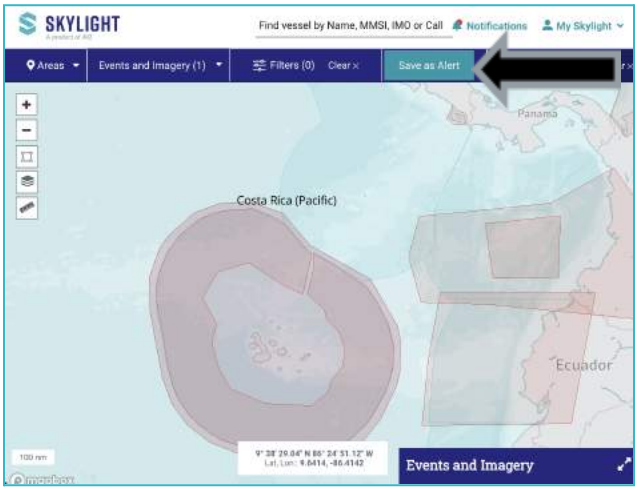
This tool is useful for measuring the distance between events and points of interest like the boundary of an EEZ or coastline. You can also measure areas such as the size of a regions:

1. Click on the ruler icon ( ) in the left-hand toolbar to open the measuring tool.
2. Select a unit of measurement of your choice
3. Click on the map to create a starting point and move the cursor to measure.
    - As the cursor moves, a live distance and bearing from the last point will display in a box following your cursor.
4. Click again on the map to add a vertex to a polygon or polyline.
    - As points are added, the sum of all distances will display in a box on the top left.
5. To close the tool, simply click on “Close Ruler” in the top left box.



Create Alerts

If you are primarily looking at the same area or applying the same filters when using Skylight, creating an alert can save you a lot of time. You must have a Custom Area before you can create alerts. The “Save as Alert” button in the top menu bar will become enabled after the Custom Area is selected.

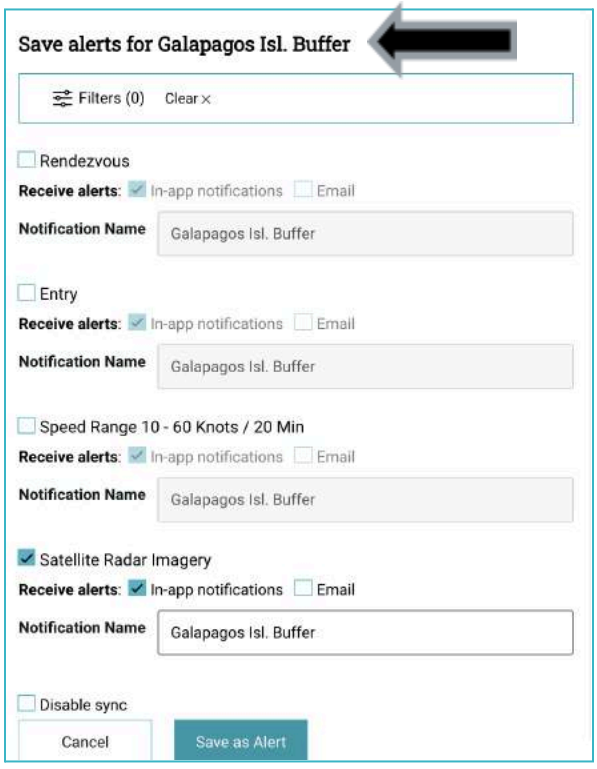


You can validate that you have chosen the right area by looking at the area name on the top of the window.

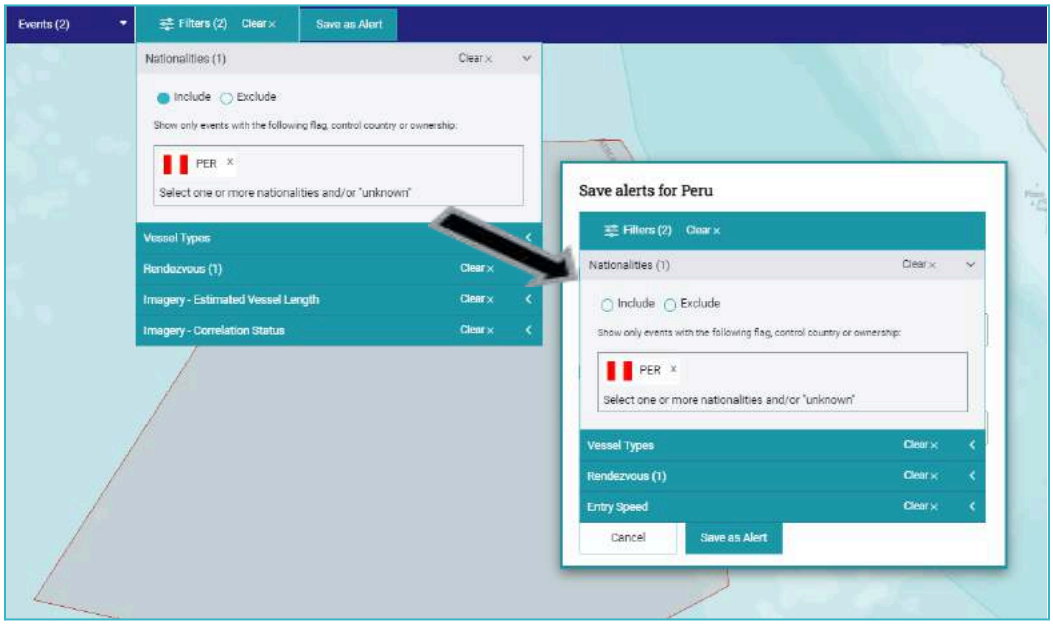
If you wish to only be alerted about a specific event type, deselect the checkbox for the events you are not interested in. In the example on the right, the user is only interested in alerts for Satellite Radar Imagery.

“In-app” alerts are for receiving audio alerts on the screen while you are actively using Skylight and Email alerts are to receive alerts via email. In the example on the right, the user has chosen only In-app alerts.

Alert names are pre-populated with the name of the area and the event type, but alert names can be changed. This alert name is also what is used in the subject of email alerts.



By default the alert creation process will take all of the filters you selected on the main map before clicking “Save As Alert”. However, you can update the filter before saving the alert.



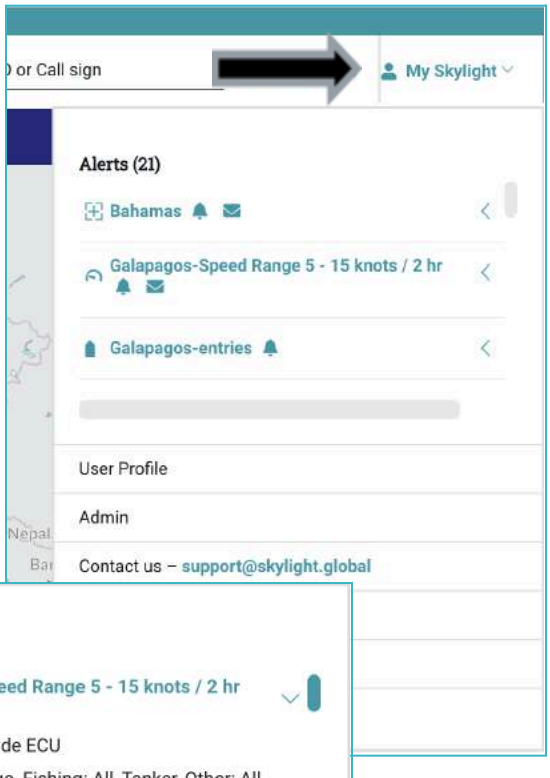
Click on “Save as Alert” to save your settings.

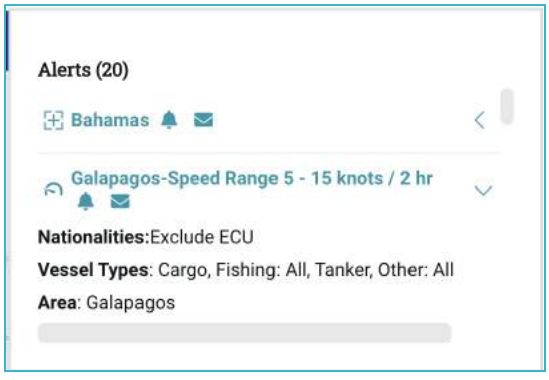
View or Change Previously Created Alerts

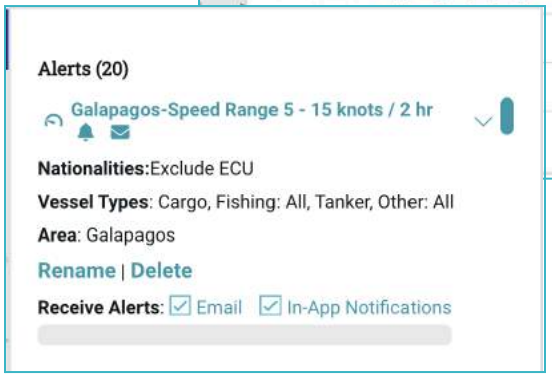
Access your alerts easily through the “My Skylight” menu. Clicking on an alert will re-run your settings and take you to that pre-set region with your filters already applied (like a ‘shortcut’).

If you have many alerts, you can use the checkbox to filter your alerts to specific event types. Otherwise alerts are listed in alphabetical order.

If you are interested in seeing the details of your alert, editing it, or turning on/off email or in-app alerts, use the arrow next to the alert.





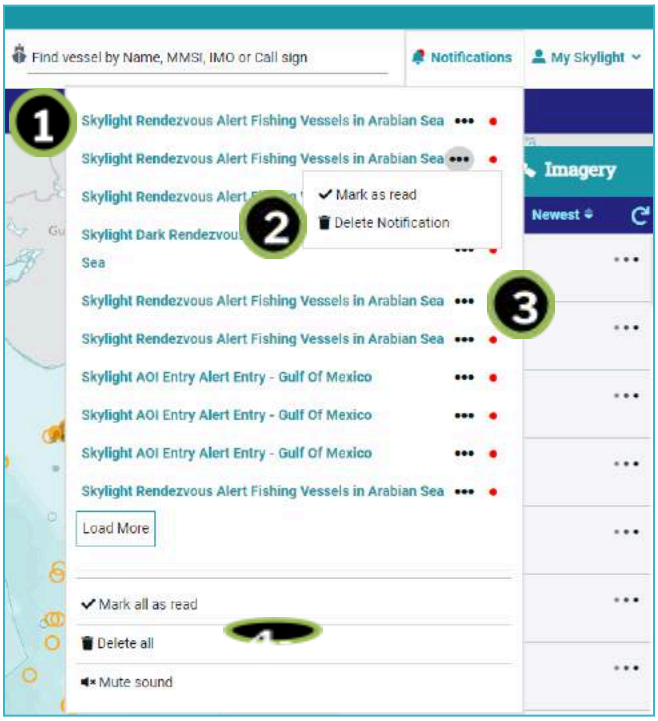


In-App Alerts

In-app alerts will send an audio notification when a new event occurs that meets the parameters of the alert. The notification center at the top of the Skylight tool will display a red dot when you have unread notifications. Each new notification will generate a sound and add to the total count.

You can take the following actions in the notification center:

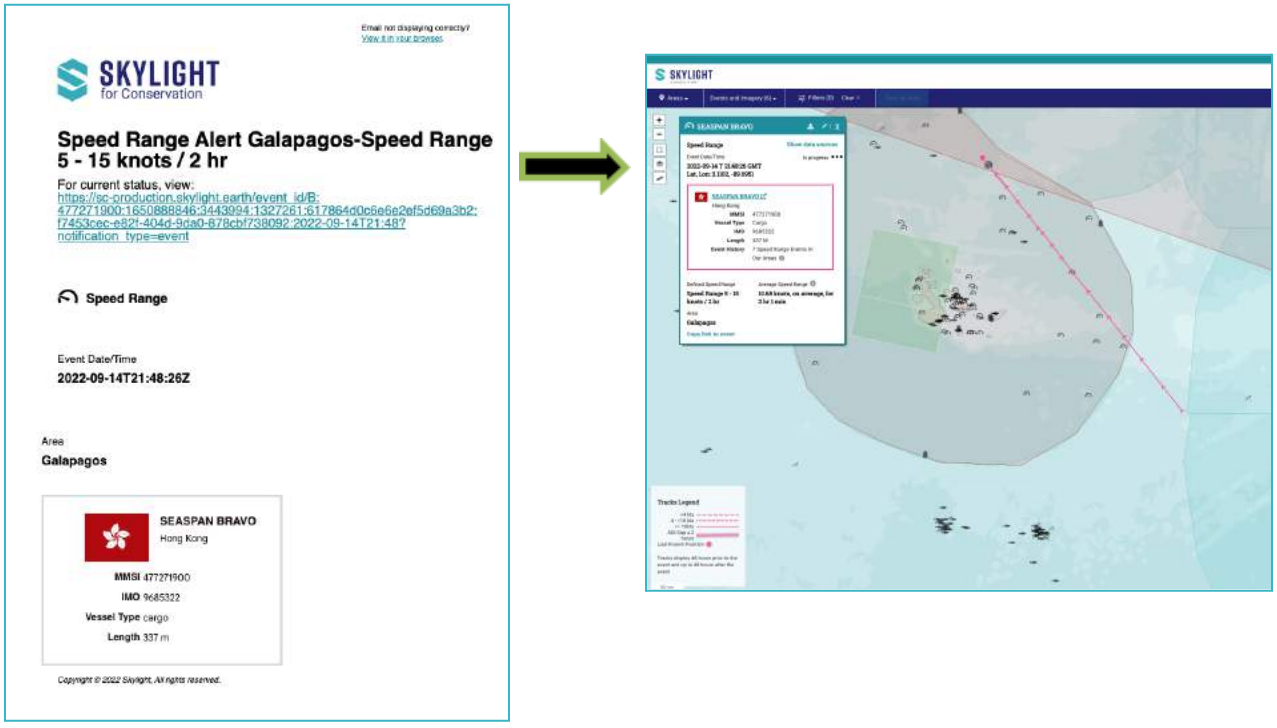
1. View the alert by clicking the alert itself
2. Mark an alert as read
3. Delete an alert
4. Mark **all** alerts as read
5. Delete **all** alerts
6. Mute/unmute the notification sound



Email Alerts

Email alerts will notify you via email as soon as an event that matches your criteria is detected. A link which will allow you to view updated information about the event within the Skylight platform.

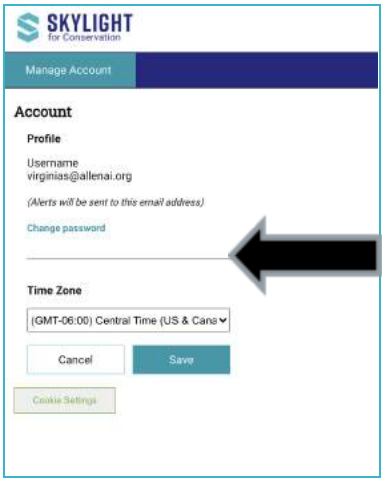
NOTE: The information in the platform may contain different information from the email if changes have occurred (e.g. the duration of a Dark Rendezvous has increased since the email was sent).



NOTE: If you have questions or concerns about an email alert, you should not reply directly to the email. Please contact support@skylight.global instead.

Change Time Zone Display

Change the display of the time zone in Skylight based on your preference by following these steps:



1. Go to **My Skylight → User Profile**
2. Open the drop down and select your time zone **(see right)**
3. Click Save to set your time zone setting

Note: Time zone will still be UTC for any downloaded CSV/KML data.

Change Username or Password

Under “User Profile”, you can also update your username (email address) or password while retaining all of your Custom Areas and Alerts. Updating your username can be helpful if your email address changes, you want to pass your account to another staff member in the same organization, or you want to convert a personal work email to a shared email with your team.

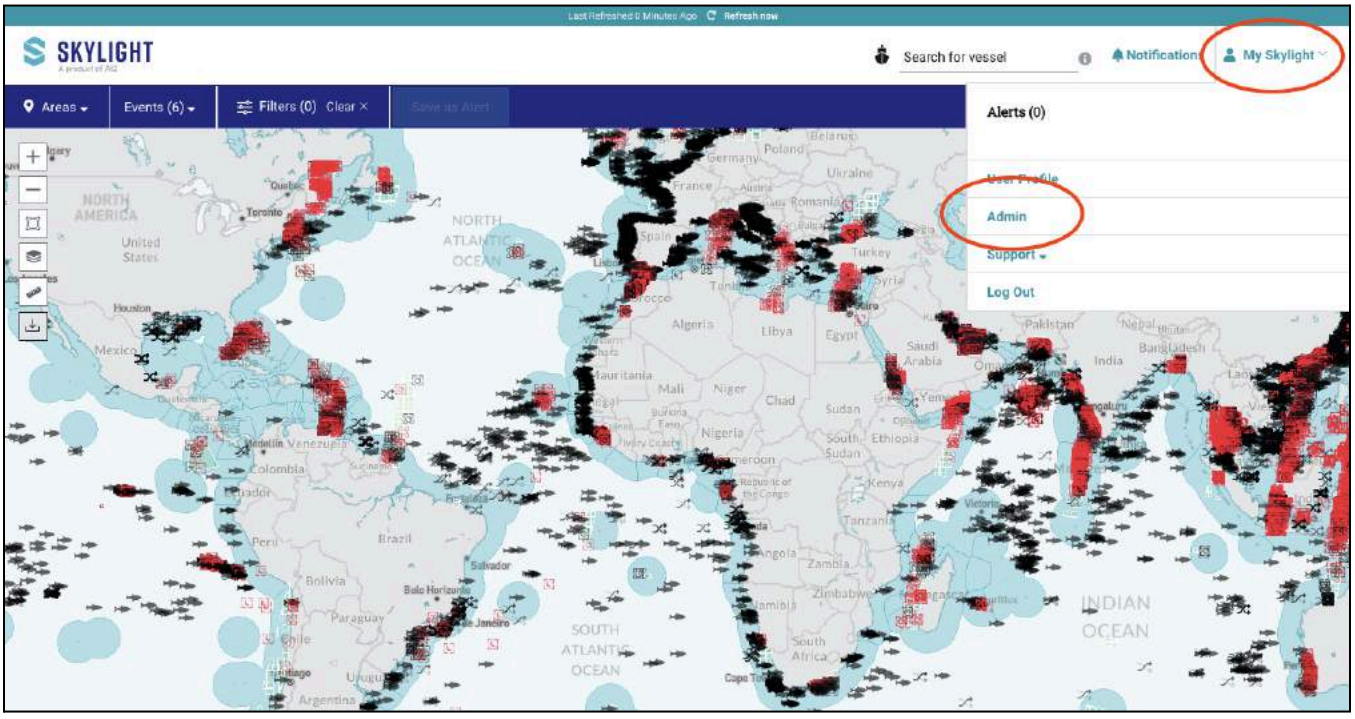
Administrate Accounts

Users can become “administrators'' of their organization and help manage accounts within the organization. Admins can directly conduct the following activities for staff in the same organization:

- Create new accounts
- Add details (e.g. Name, Department, Title)
- Delete accounts
- Send password reset instructions
- Check whether an account has been used recently
- Download a list of all staff that have access to Skylight

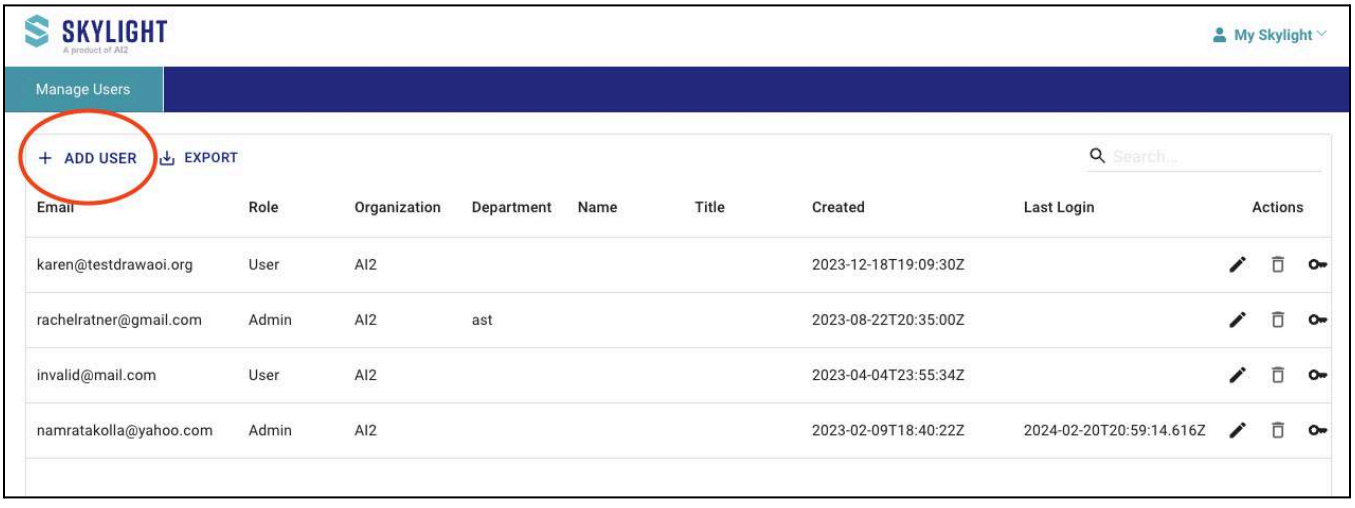
The very first administrator of a group must be assigned by a Skylight staff member. If you would like to nominate an administrator, please fill in this form.

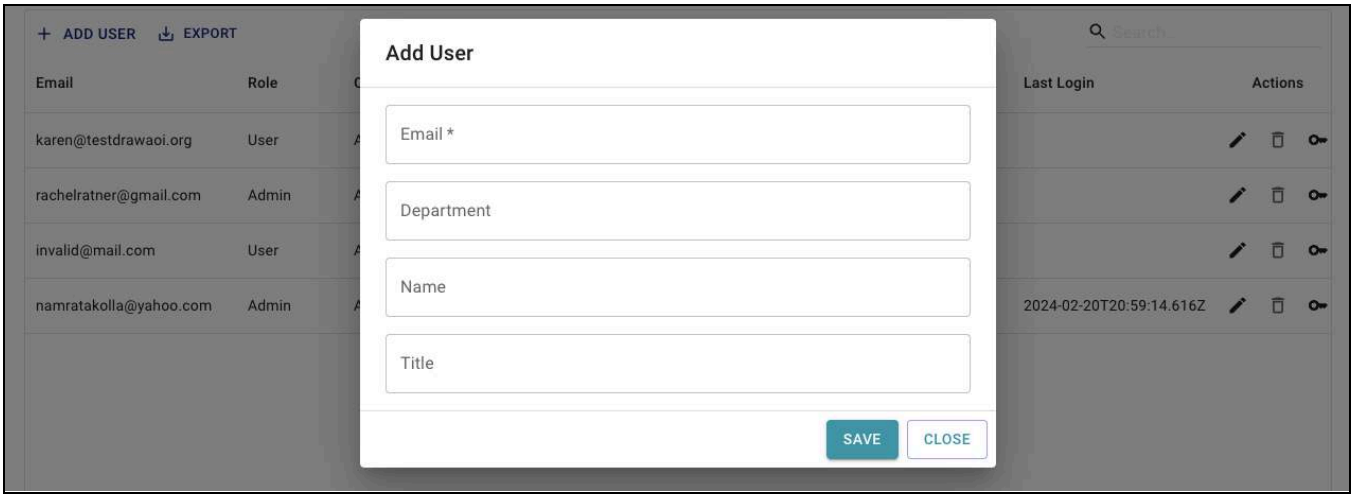
Admin functionalities are accessible through the “My Skylight” menu:



Creating Accounts

Admins can create new users using the “Add User” button. Complete the fields to create the account. After hitting “Save”, an email will be sent to that new account with instructions on how to set their password.





Example confirmation email the new user will receive:

Welcome to Skylight!

This email includes information to activate your account by setting a new password. Save this email for future reference.

Set your password at: https://sc-production.skylight.earth/recoverpassword

- Enter your username:
- You will be emailed a link to set your password

From there onwards, access Skylight here: https://sc-production.skylight.earth/login

Best,
Skylight Support Team
support@skylight.global
www.skylight.global

Editing Account

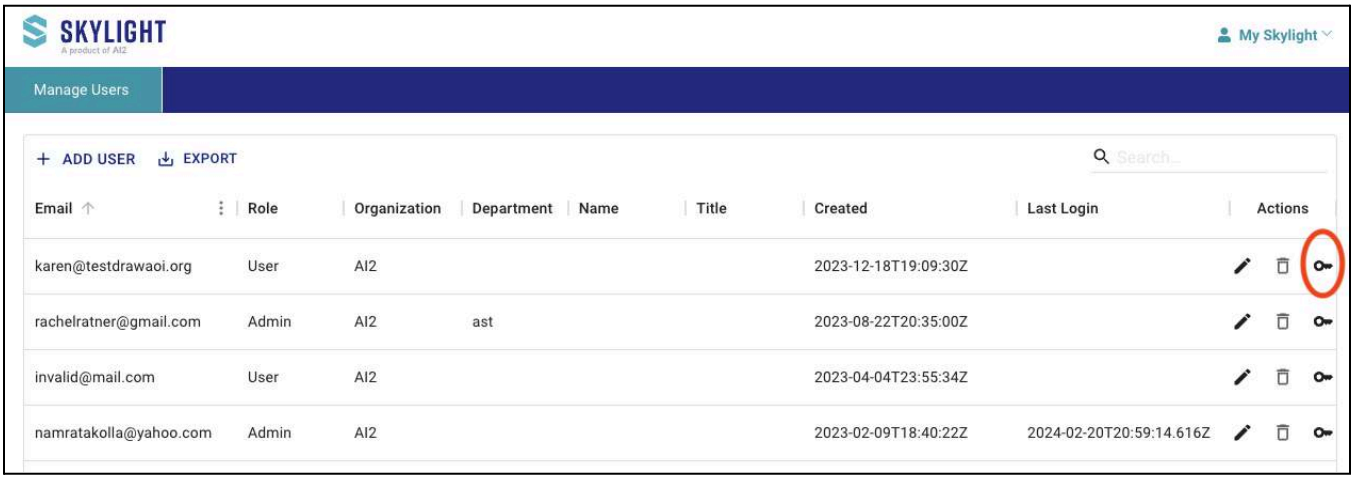
Using the pencil icon, admins can add additional details about a person, change their username for them, promote them into an administrator, etc.

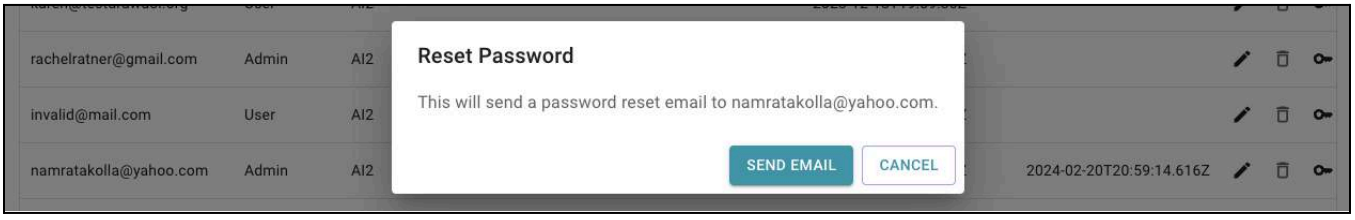
Deleting Account

Admins can use the trash can icon to delete an account.

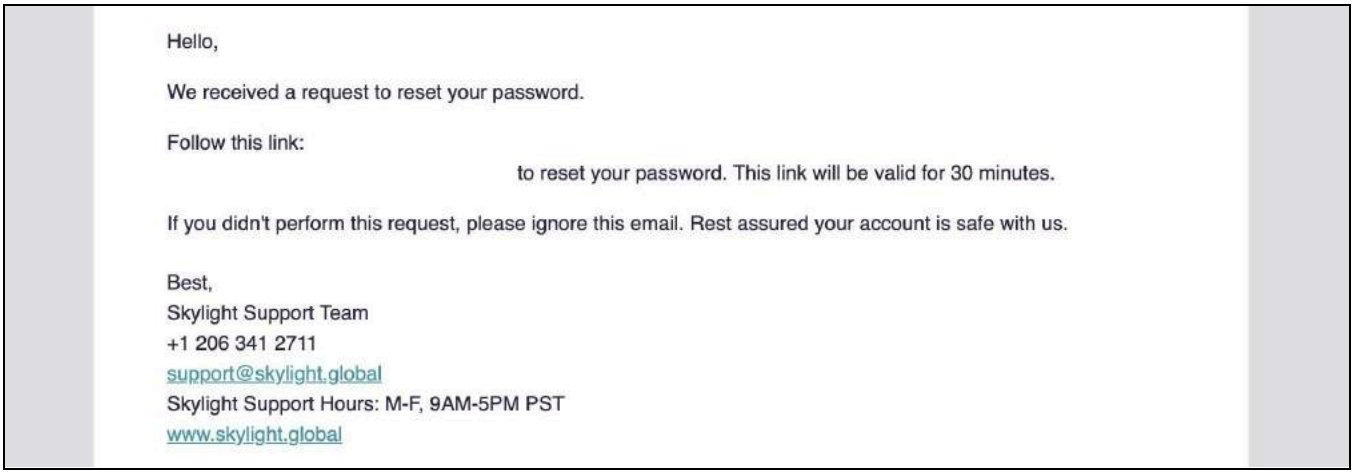
Initiate Password Reset

If one of your colleagues has lost their password, they can always use the “Forgot Password?” option on the Skylight login page. Alternatively, admins can initiate an email for them to reset their password by clicking on the key icon. It sends them through the same process.





Example reset email the new user will receive:



Hello,

We received a request to reset your password.

Follow this link:

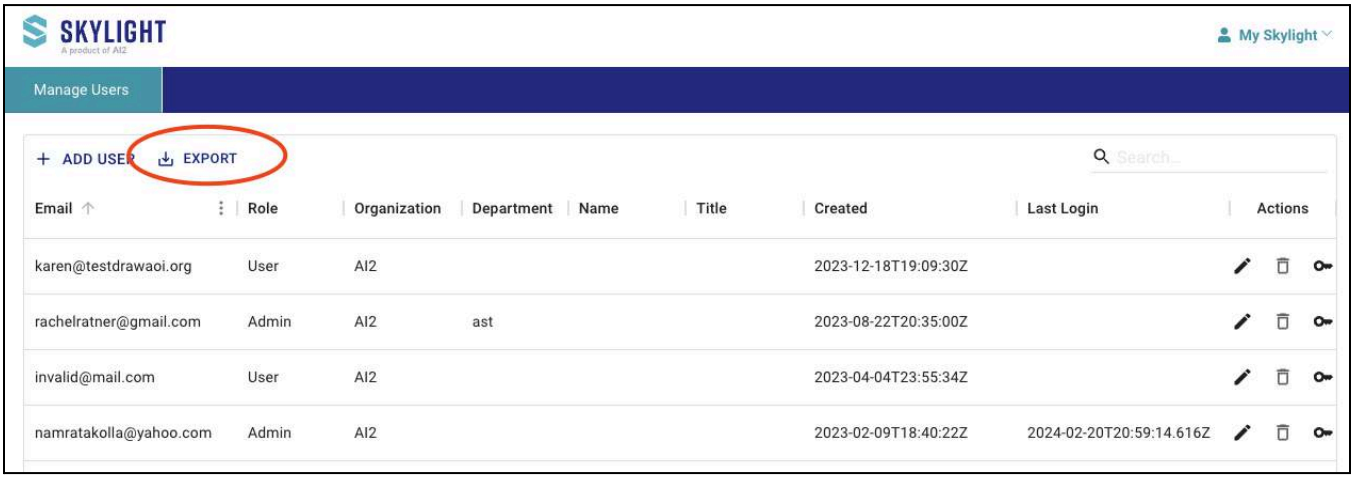
to reset your password. This link will be valid for 30 minutes.

If you didn't perform this request, please ignore this email. Rest assured your account is safe with us.

Best,
Skylight Support Team
+1 206 341 2711
support@skylight.global
Skylight Support Hours: M-F, 9AM-5PM PST
www.skylight.global

Export Accounts

Admins can download a list of all users with Skylight accounts in their organization using “Export”.



Example of downloaded CSV file:

Skylight (3)

Email	Role	Organization	Department	Name	Title	Created	Last Login
karen@testdrawaoi.org	User	AI2				2023-12-18T19:09:30Z	
rachelratner@gmail.com	Admin	AI2	ast			2023-08-22T20:35:00Z	
invalid@mail.com	User	AI2				2023-04-04T23:55:34Z	
namratakolla@yahoo.com	Admin	AI2				2023-02-09T18:40:22Z	2024-02-20T20:59:14.616Z

Troubleshooting Tips & Support

Refreshing the Page

If ever you notice an issue on Skylight, refreshing the web browser page is a helpful troubleshooting step.

"Hard Refresh"

Sometimes a "Hard Refresh" or clearing the cache can be necessary after there have been system updates to the platform. Clear your cache.

On a PC
- **Refresh** - F5
- **Hard refresh** - ctrl+F5 or ctrl+refresh button

On a Mac
- **Refresh** - Command+r
- **Hard refresh** - Command+Shift+r or shift+refresh button

If a hard refresh does not resolve the issue, please reach out to support@skylight.global for assistance.

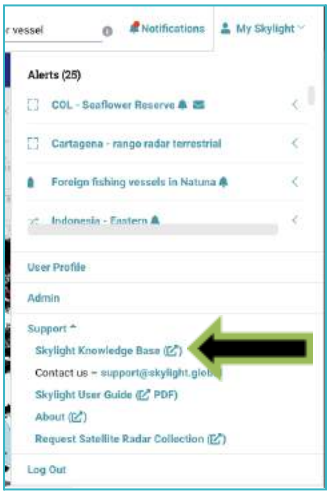
Recommended Browsers

For a better user experience, it is recommended to use a browser that we are currently supporting. You will see a warning message upon logging in if the browser you are using is not compatible with Skylight.

You can view the most updated list of browsers supported here (e.g. Chrome, Edge, Firefox, and Safari for Desktop users).

Knowledge Base

The Skylight Knowledge Base has deeper technical information about many of our data sources, events, and functionalities. Reference the Knowledge Base from the "My Skylight" menu.



Training Videos (YouTube): Skylight maintains a YouTube channel with instructions on how to use many parts of our platform.

Contact Us Directly: email support@skylight.global