04 LESSONS - 106 MIN

# Environmental Journalism

This course teaches tools that a journalist can use to find and report on stories about the environment.

**Tools Used:**
Google Earth Timelapse, Global Forest Watch, Global Fishing Watch, Google Earth Engine.

LESSON 01

# Google Earth Timelapse: Observing change

Observe how the earth has changed over the course of the last 35 years.

# Lesson overview

## Observe how the world has changed over time

Google has access to a huge database of satellite imagery that goes back to 1984. It's made from over 15 million satellite images acquired by the USGS/NASA Landsat program and European Sentinel program.

Earth Timelapse is global zoomable tool that allows you to observe cloud-free change on the earth's surface over the last 34 years.
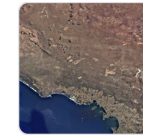


| | |
|---|---|
| 1 | Introduction to timelapse |
| 2 | Find a location |
| 3 | Share your timelapse |
| 4 | Timelapse video library |

For more Environmental Journalism  lessons, visit:
newsinitiative.withgoogle.com/training/course/environmental-journalism

# Introduction to Timelapse

Accessing satellite data to show how the world has changed was once the realm of geographers. Earth Timelapse makes finding and sharing cloud-free satellite imagery as easy as point and click

Navigate to earthengine.google.com/timelapse/

Earth Timelapse combines over 15 million satellite images from five  different satellites.

The imagery comes from both NASA and European Space Agency datasets. The majority of the imagery is from Landsat, a joint United State's Geographical Survey and NASA project, which has observed the Earth since the 1970s.
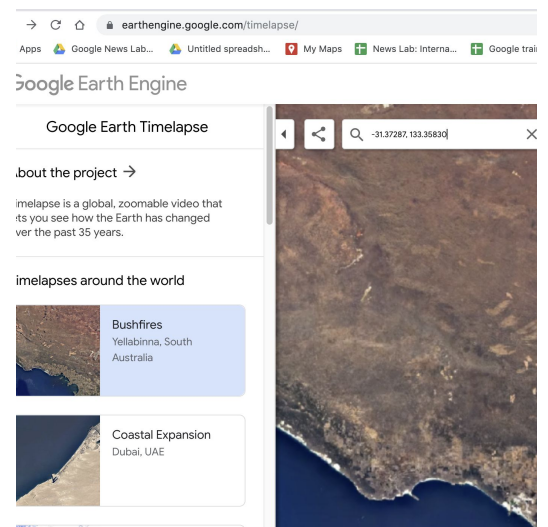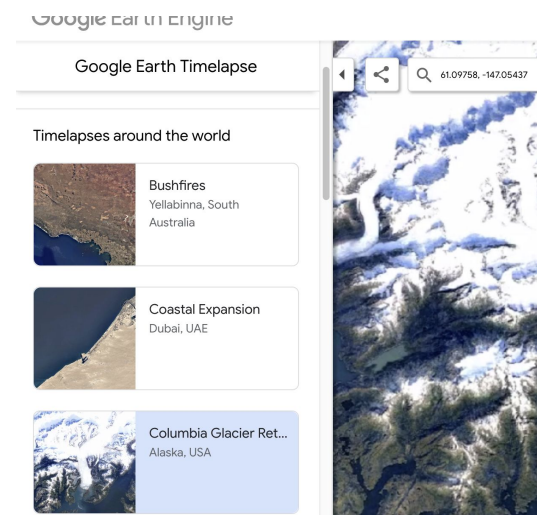
The left column has some examples that have been premade showing the tool's capabilities. These include satellite imagery of:
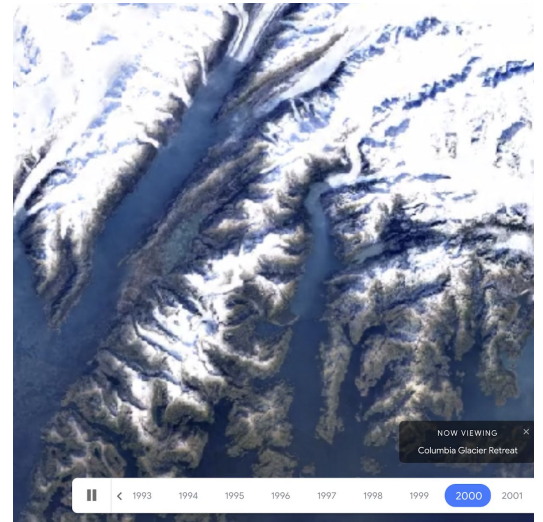
Bushfires in Australia;
Coastal expansion in Dubai;
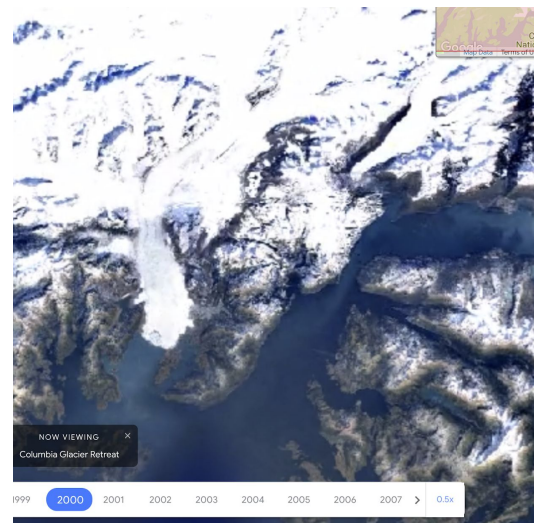Glacier retreat in Alaska;

The arrow at the top will hide this panel.

The slider along the bottom shows the year that you are currently viewing. If you press **play/pause** the satellite imagery will scroll through with the year you are viewing highlighted in blue.

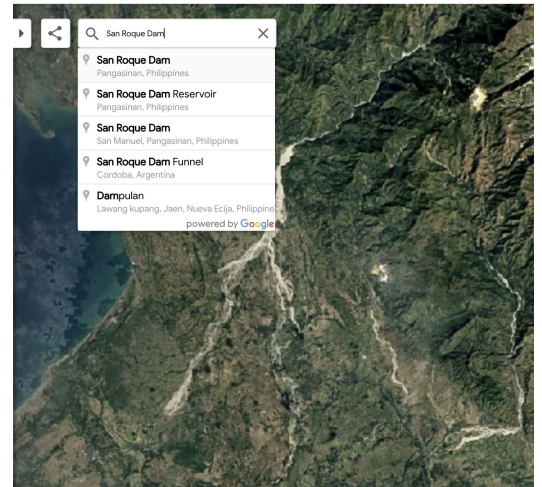On the right of the slider you can control the speed of the playback.

# Find a location

The search bar on the top left is powered by Google Maps.
You can search for any location in the world.
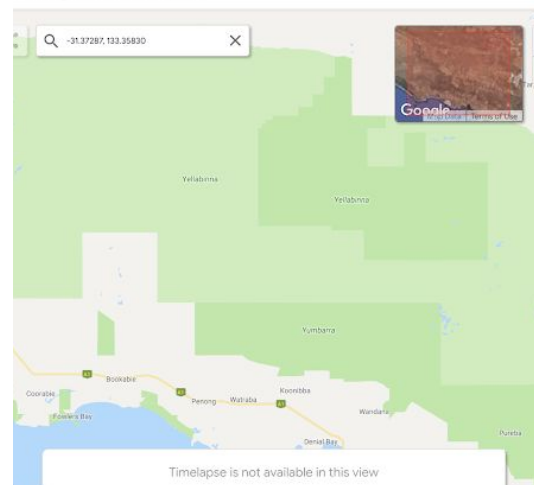When you click enter Timelapse will go directly to that
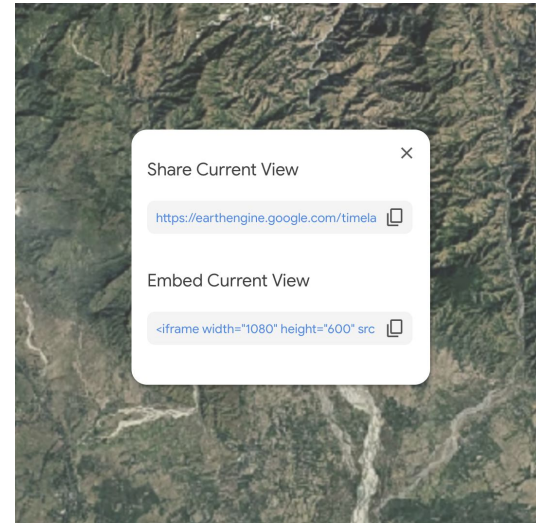location.

Click on the context map in the upper right to enter "Maps
Mode"

# Share your Timelapse

Once you have found an area of interest you can share or embed the view by clicking the share icon in the top left. You will be given the option of sharing a direct link to your view or an embed code that will allow you to place the timelapse into a story.
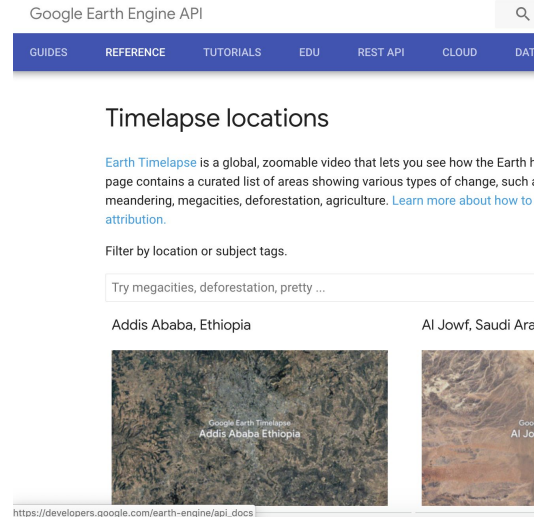
# Use Timelapse videos

SINGLE STEP

Timelapse video library contains over 300 4k
pre-rendered videos that can be used in stories.
The videos can be searched for by

They are searchable by location and by theme, such as
deforestation, mining, etc:

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# Congratulations!

You completed "Google Earth Timelapse: Observing change."

To continue building your digital journalism skills and work toward Google News Initiative certification, go to our Training Center website and take another lesson:
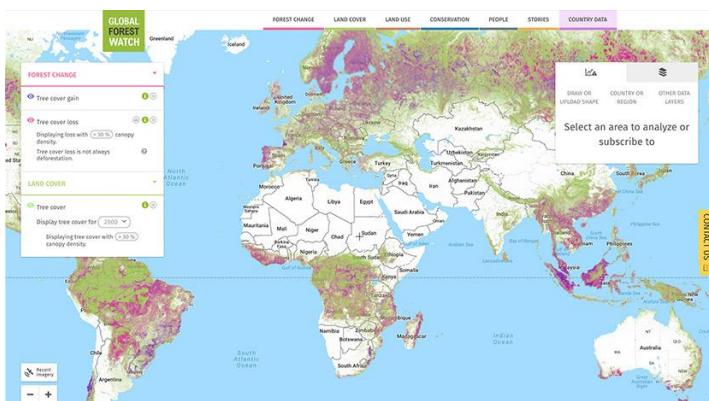


7 min estimated time

Datasource: Global Forest Watch

Deforestation data and monitoring tools.

For more Environmental Journalism  lessons, visit:

newsinitiative.withgoogle.com/training/course/environmental-journalism

**LESSON 02**

# Data Source: Global Forest Watch

Deforestation data and monitoring tools.

# Lesson overview

## What is Global Forest Watch?

Global Forest Watch (GFW) is a remarkable collaboration of the World Resources Institute, Google, the Jane Goodall Institute and other partners that provides data and tools to help journalists, governments and researchers understand harmful forest loss and its effect on climate change.

In the past, people have struggled to understand when and where forests are cleared, why it happens, and who is responsible. Using satellite data and cloud computing, GFW monitors the world's forests in near real time—delivering data about deforestation, fires, climate and commodities that would have formerly taken years to gather and process.
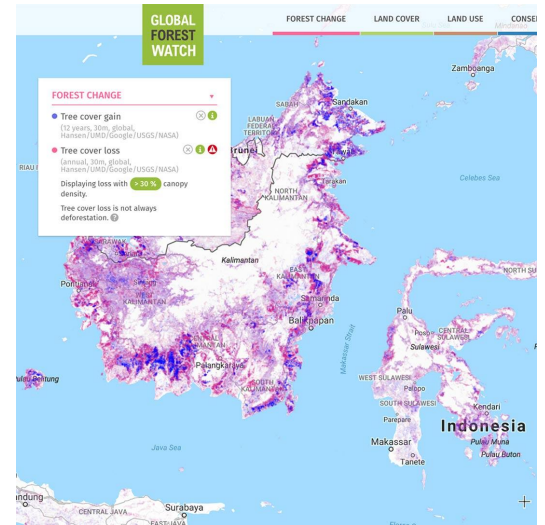
| 1 | Reporting on climate change. |
|---|---|
| 2 | Interactive map of forest change. |
| 3 | Customize your interactive map. |
| 4 | Country profiles. |
| 5 | Monitoring fires on GFW. |
| 6 | Analyze commodity supply chains. |
| 7 | Learn more about GFW. |

For more Environmental Journalism lessons, visit:
newsinitiative.withgoogle.com/training/course/environmental-journalism

# Reporting on climate change.

The GFW platform will help you report on climate change by providing timely, in-depth information on carbon emissions from tropical deforestation. You can explore landscapes and analyze carbon data on our interactive map, as well as customize reports to show only the data you want to see and share it with your story.

Several tools also help you monitor change over time and compare countries, jurisdictions and areas of interest. You can even monitor deforestation in conjunction with carbon emissions, and look at data on canopy density, carbon stores in trees and carbon stores in soil.
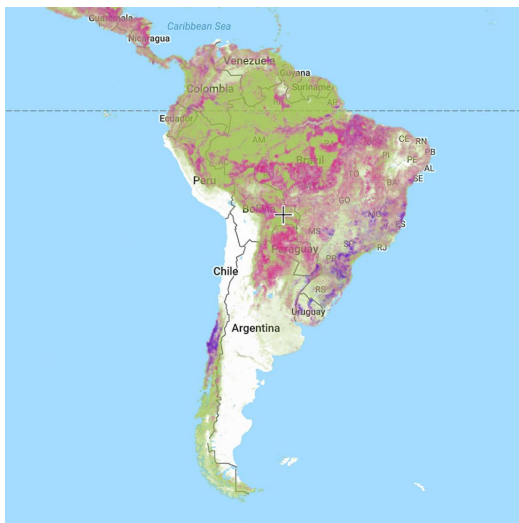
# Interactive map of forest change.

The central tool of GFW is an interactive map depicting the world's forest change (tree cover and loss) powered by data sets that stretch from 2000 to 2018.

To explore the interactive map, first go to globalforestwatch.org, then **Map**.
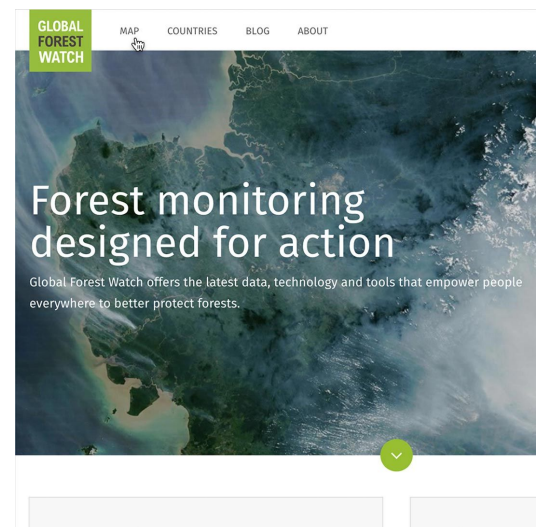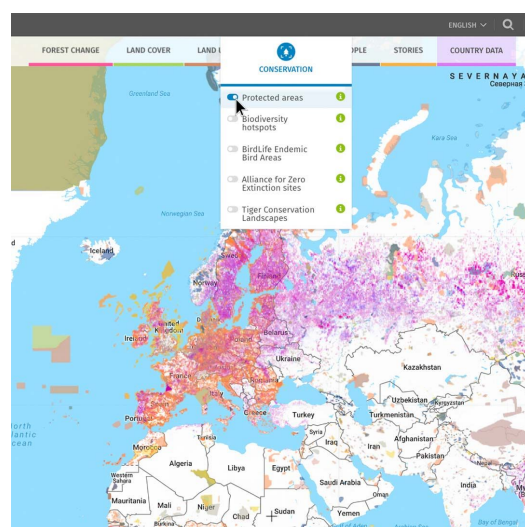
Use the map to look at forests around the world.
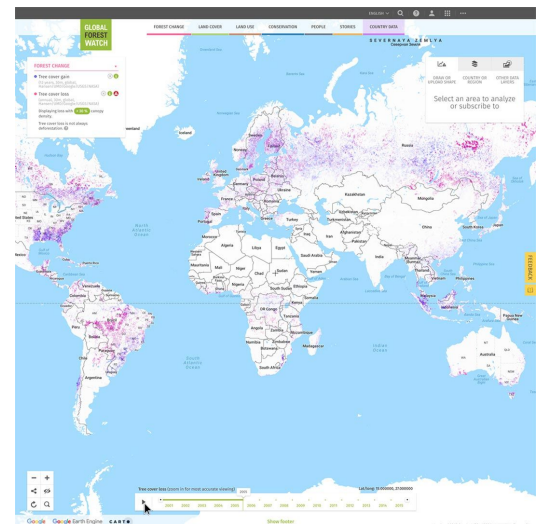
To focus on subsets of time, use the slider at the bottom of the map.
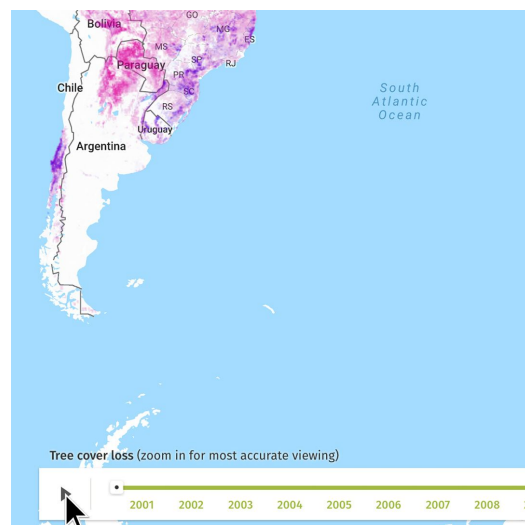
Turn specialty layers on or off to show factors such as conservation areas, land use, and intact forest landscapes.

# Customize your interactive map.

The interactive map also allows you to get more granular views of impacts in specific regions you may be covering and to modify the look of the map per your needs.

Customize your map view by clicking **Country Data** and selecting a country or region or drawing your own area to analyze.
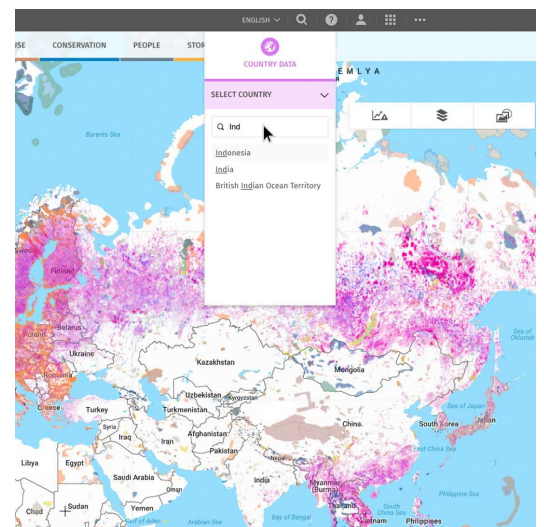
Choose from a variety of base map options such as satellite, terrain or road maps.
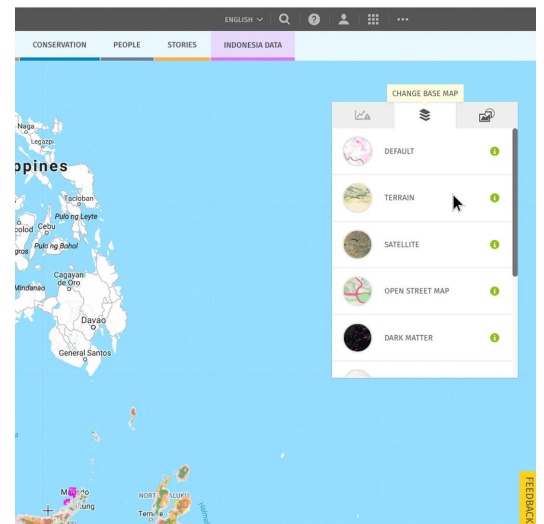
# Country profiles.

If you know what country you want to research, you can go straight to its profile.
GFW carries data on 204 countries.

Rollover the navigation bar to reveal the top nav. Then click **Countries**.
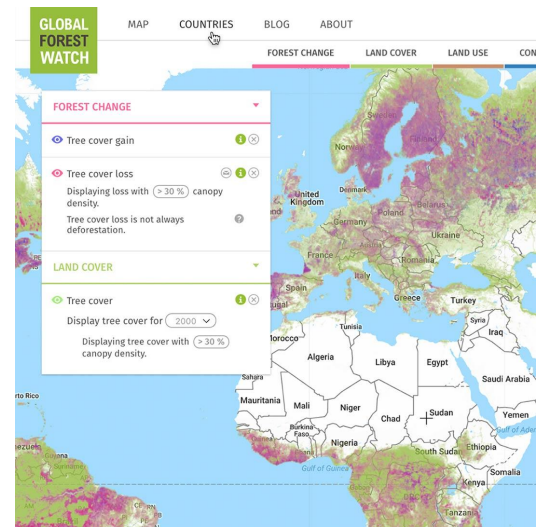
Choose from the 204 countries
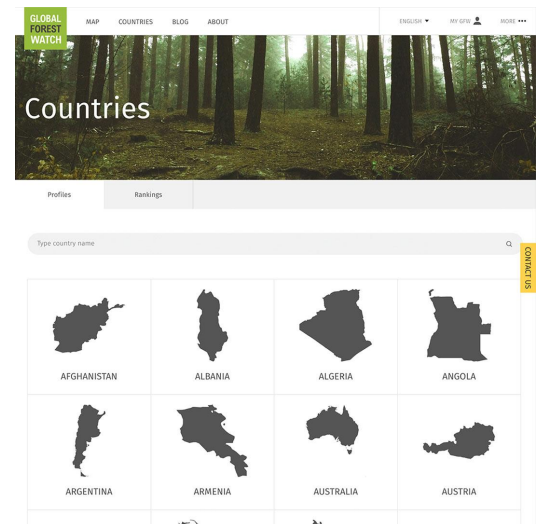
Using Indonesia as an example, you can see a remarkable amount of data.
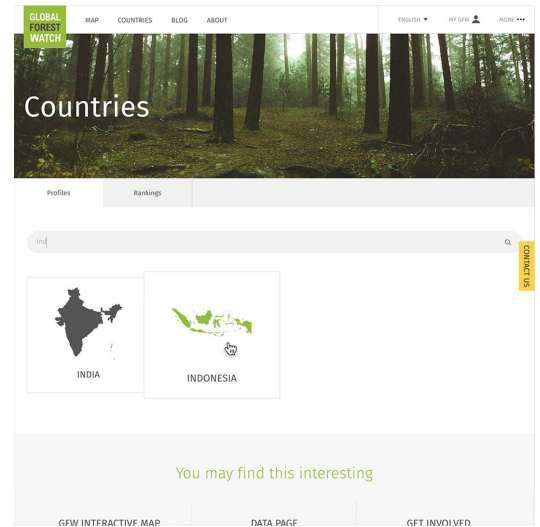
Click through the tabs to reveal statistics on land cover, forest loss and management, economic impact and employment related to forests, governmental management, reforestation, CO2 emissions, carbon stocks and international agreements.
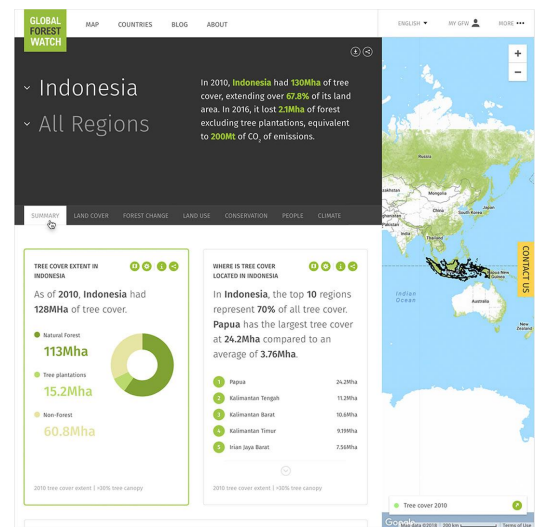
You can also see a country's forest profile in context with other countries by choosing **Rankings.** This shows the countries with greatest tree cover loss at the top: Russia, Brazil and Canada.



Countries with greatest tree cover loss
(2001-2016)
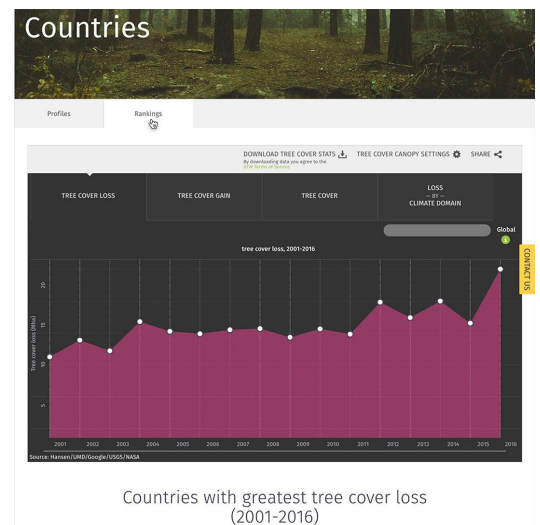
# Monitoring fires on GFW.

GFW Fires is a tool to monitor emerging fires, identify potential causes, and analyze impacts of fires on forests and people.

From any page, you can click **More** to access additional GFW apps.
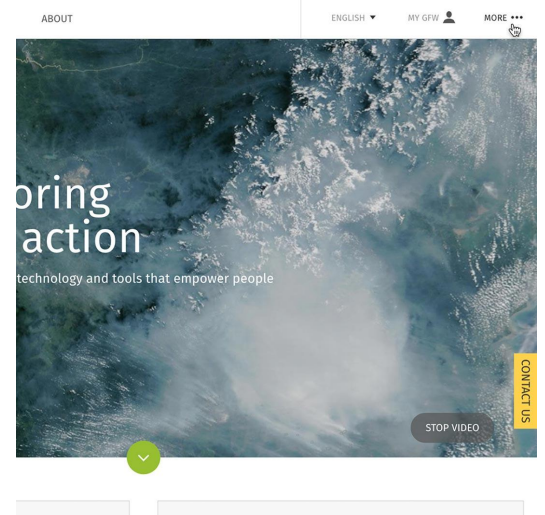
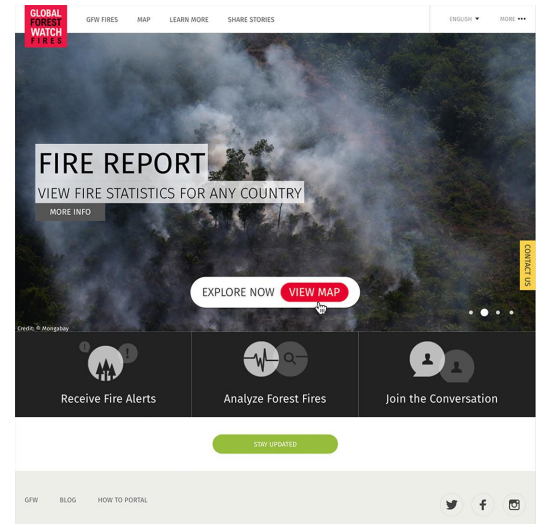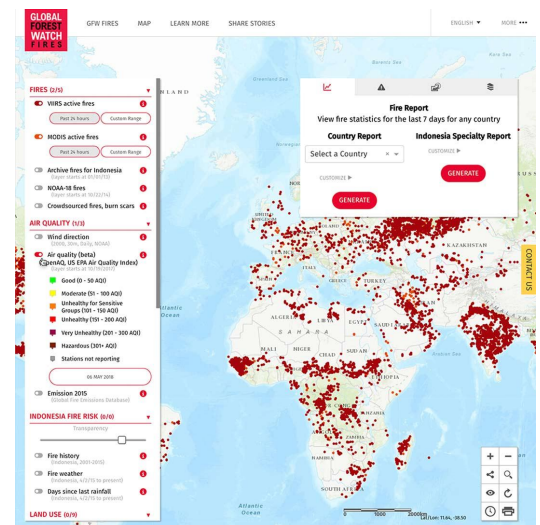Select **Global Forest Watch Fires**.
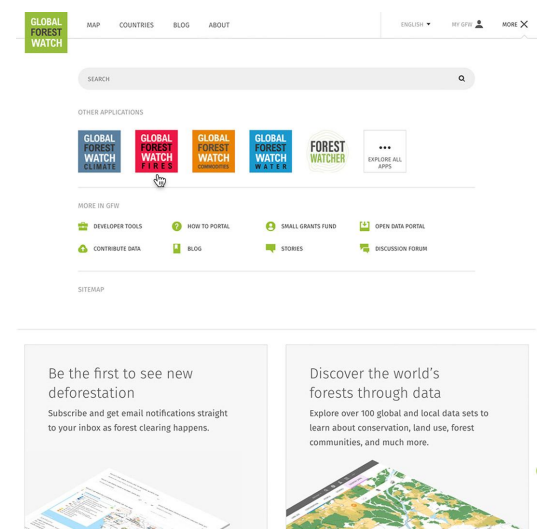
Click **View Map.**

Here you can see fires around the world, look at air quality and haze, and quickly access a fire report for any country in the past seven days.

You can also sign up to receive fire alerts via SMS or email for any region you need. Just click **Start Drawing** and outline the desired area.  Then click the **fire alerts email or SMS messages** link.
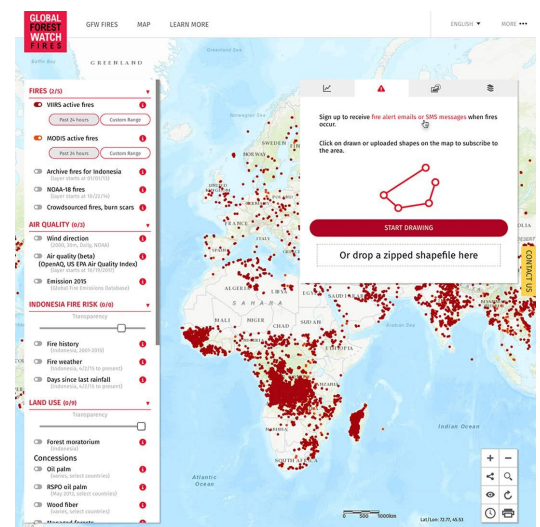
# Analyze commodity supply chains.

The GFW Commodities tool illuminates deforestation related to commodity supply chains for palm oil, soy, beef, wood pulp, and other products. For example, you can monitor activity in Indonesia near palm oil mills to see if there is corresponding forest loss in the area. This tool may be extremely useful for journalists covering the intersection of business interests and environmental preservation.
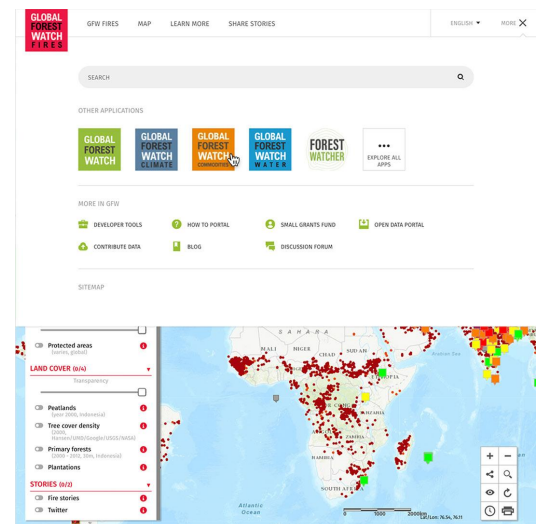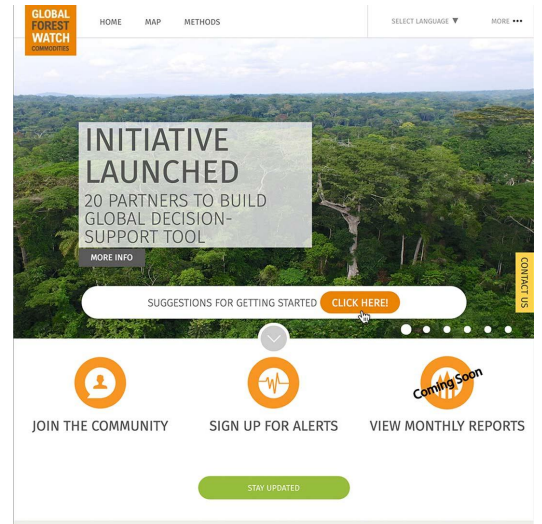
From any page, you can click **More** to access additional GFW apps.
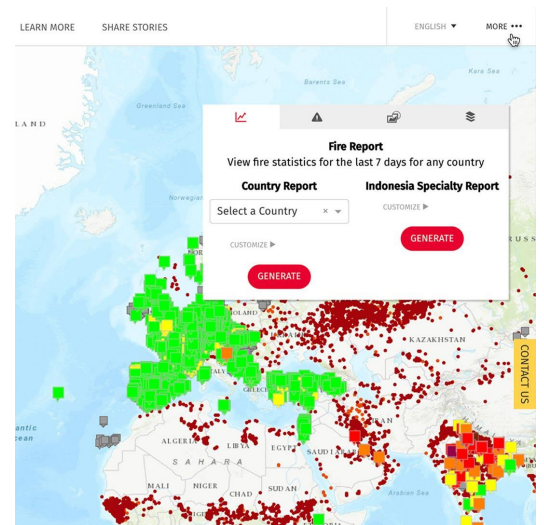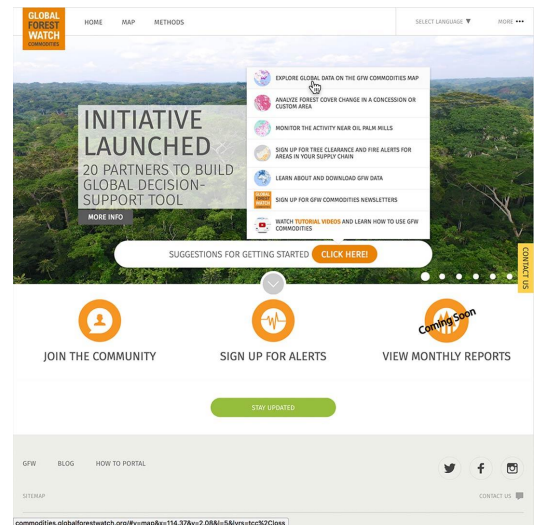
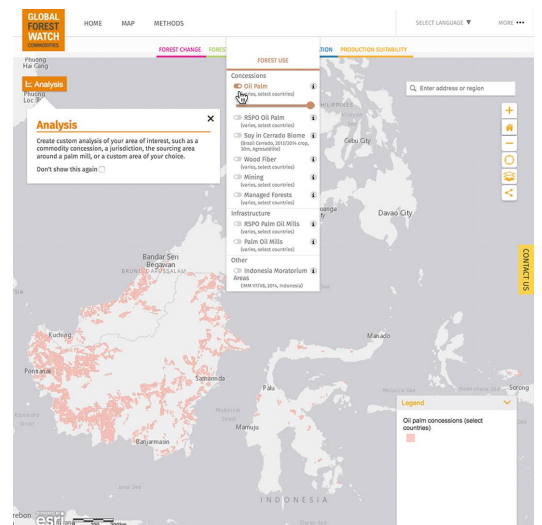Click **Global Forest Watch Commodities**.

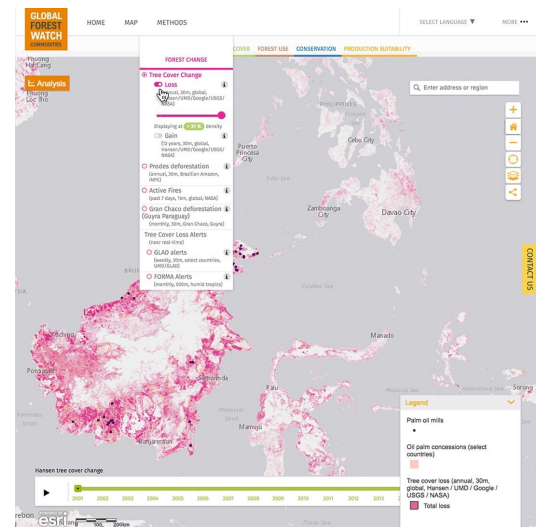Click the **Click Here!** button.

Select **Explore Global Data on the GFW Commodities Map.**

Under **Forest Use**, turn on **RSPO Palm Oils Mills** and **Palm Oil Mills**.

Under **Forest Change**, turn on **Loss** to see the Tree Cover Change in that area. You can adjust the opacity of the layer with the slider so you can continue seeing the details beneath.
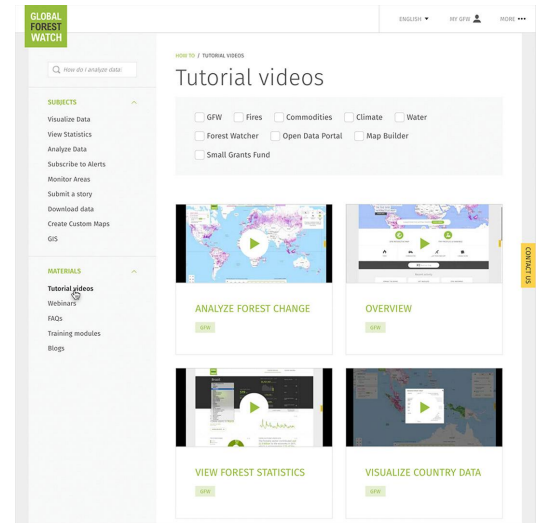
Google News Initiative

# Learn more about GFW.

The GFW platform is an incredibly rich source of information for journalists. While this lesson provides an overview of its tools, there are many video tutorials you can watch to dive deeper.

For videos on analyzing forest change, visualizing country data, comparing countries and much more, watch Global Forest Watch Tutorial videos.

# Congratulations!

You completed "Data Source: Global Forest Watch."

To continue building your digital journalism skills and work toward Google News Initiative certification, go to our Training Center website and take another lesson:
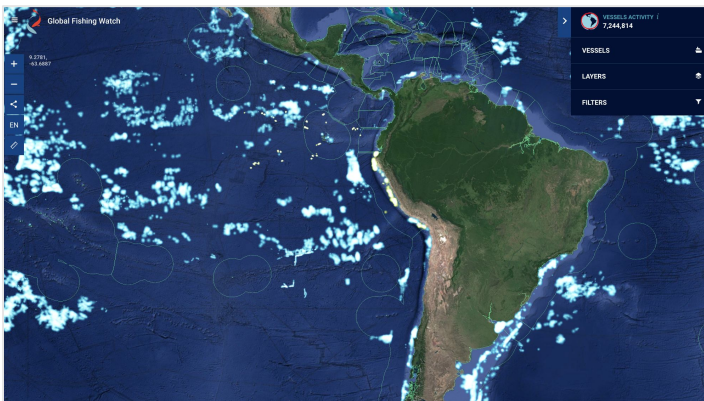


5 min estimated time

### Global Fishing Watch: Monitor fishing fleets and vessels

A guide to using Global Fishing Watch's mapping tool to track global fishing activity.

For more Environmental Journalism lessons, visit:

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LESSON 03

# Global Fishing Watch: Monitor fishing fleets and vessels

A guide to using Global Fishing Watch's mapping tool to track global fishing activity.

# Lesson overview

## Introduction to Global Fishing Watch.

Global Fishing Watch was born out of a collaboration between Oceana, Skytruth and Google to provide the world's first open-access view of commercial fishing. It has since spun-off as an independent non-profit and continues to strive for sustainable management via increased transparency in fisheries.
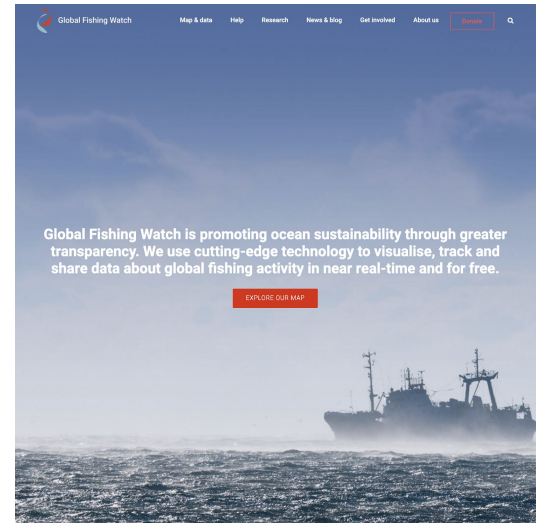
| 1 | Join Global Fishing Watch |
| 2 | Explore Global Fishing Watch Map |
| 3 | Global Fishing Watch Tool box |
| 4 | Searching in Global Fishing Watch |
| 5 | Understanding AIS and VMS data |

For more Environmental Journalism lessons, visit:

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# Join Global Fishing Watch

In order to access the more advanced features of Global Fishing Watch such as tracking vessels and creating custom fleets, you first have to sign up for access to the tool.

**SINGLE STEP**

Visit globalfishingwatch.org/join to register for a Global Fishing Watch account. You can use your Gmail account or create an account and password with your email address.

# Explore Global Fishing Watch's Map

The interactive map allows you to track the global fishing effort in real time around the world. The map does this by capturing the location information from different maritime systems to paint a picture of commercial fishing from a global point of view.
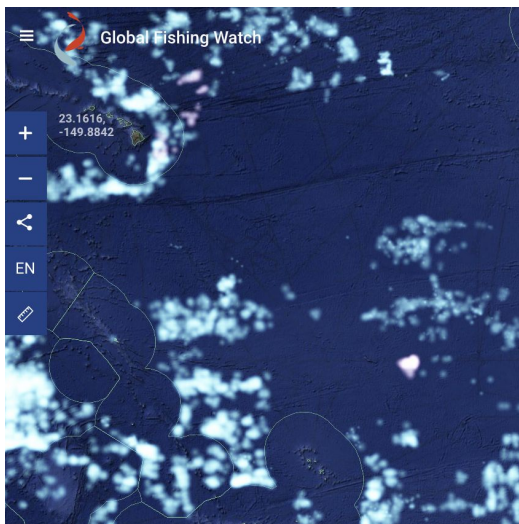
Once you have registered you can access Global Fishing Watch's map which tracks commercial fishing in near real time around the world.
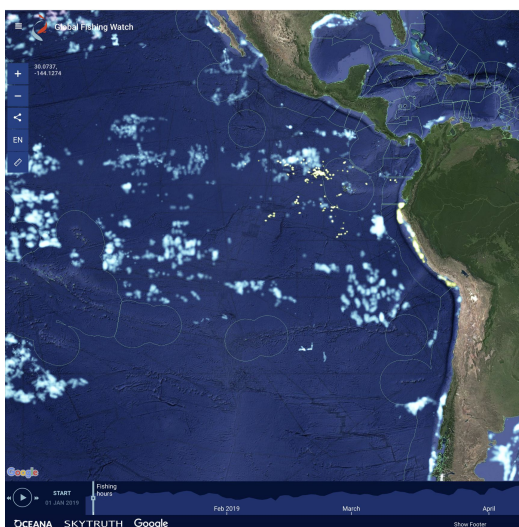
The standard features are on the left side of the map. These allow you to zoom, share as a link or embed and measure distances on the map.

The time slider at the bottom of the map determines the time period over which fishing activity is displayed. Select start and end dates from the calendar, dating back to January 1, 2012, and up to near real-time.
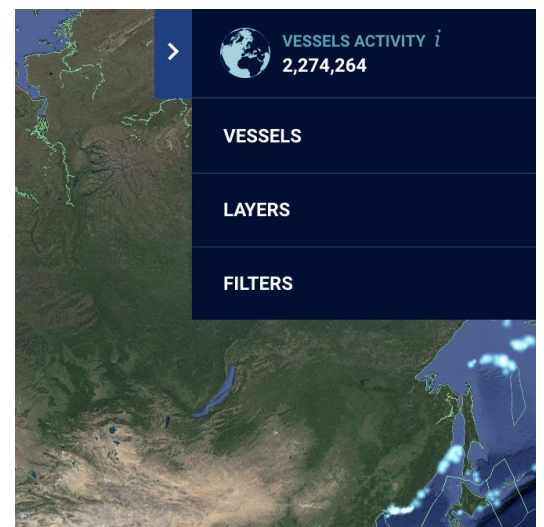
Or - Click on the bars on the left or right edge of the time slider, hold and drag to change the start or end time.

Or- Click on the gear icon in the upper left corner of the highlighted time frame within the time slider to adjust the time frame you are interested in.

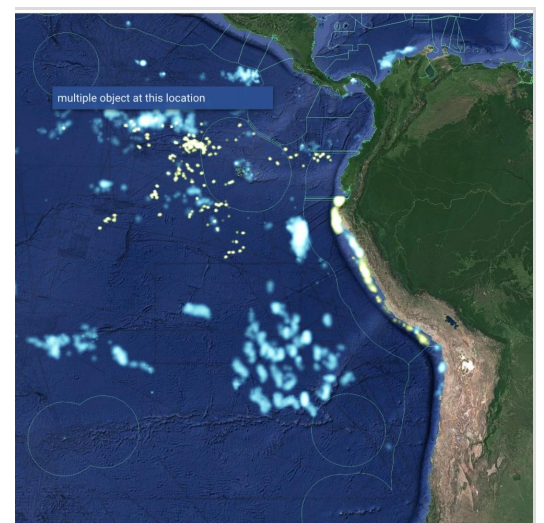The toolbox on the top right is your control center for the data displayed on the map.

To select a specific vessel from the fishing activity displayed on the map:

Click on fishing effort to open vessel identity in the toolbox and track the vessel.

Where there are multiple vessels in close proximity, you may need to zoom in.

# Global Fishing Watch Toolbox

The Global Fishing Watch Toolbox allows you to interact with the data collected on all of the world's fishing vessels. From here you can track individual boats, countries or create custom fleets of trawlers.

If you click on the **Vessels** tab in the top right it will open the search tab where you can search for any given vessel.
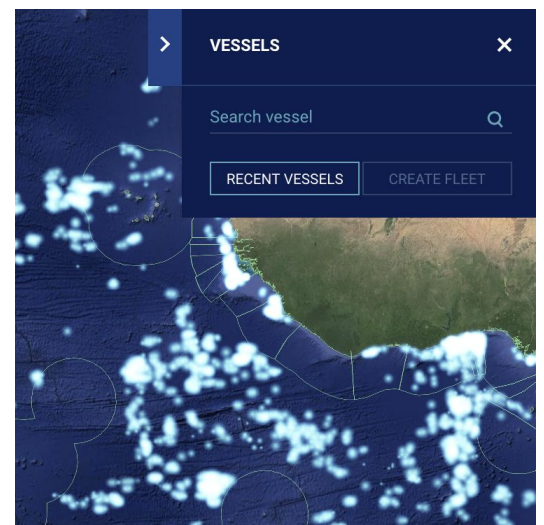
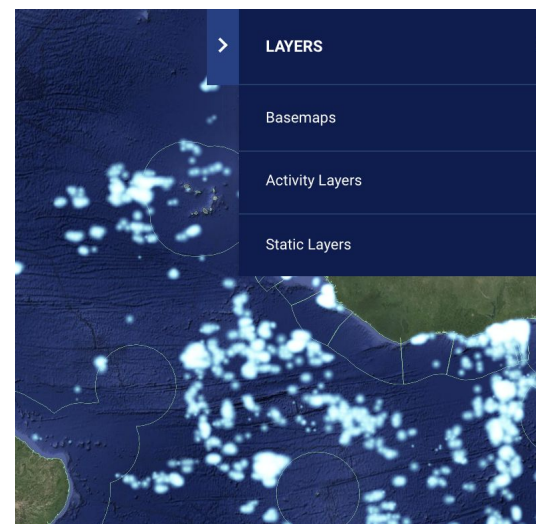Clicking on layers gives you the option of:

Changing Basemaps, which relate to the appearance of the map

Changing the activity layer alters the kind of information displayed.

Finally you can edit static layers, like Exclusive Economic zone or Marine Preservation Areas, overlayed, or edit the basemap.
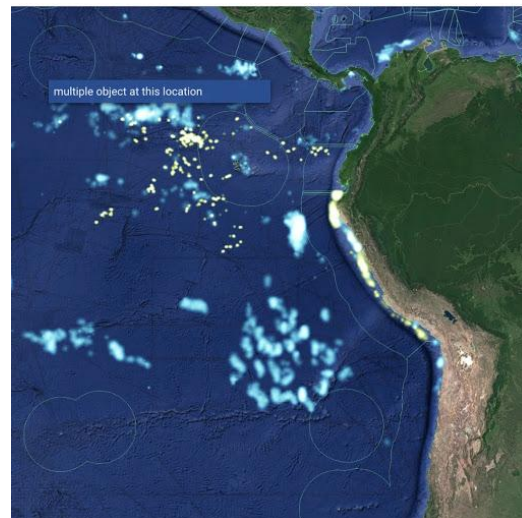
To select a specific vessel from the fishing activity displayed on the map:

Click on **'fishing effort'** to open vessel identity in the toolbox and track the vessel.

This may require zooming in where there are multiple vessels in close proximity.

What does Global FIshing Watch mean by "fishing effort"? They analyze data about a vessel's identity, type, location, speed and direction, and apply a fishing detection algorithm to determine "apparent fishing activity" based on changes in vessel speed and direction. The algorithm classifies each broadcast data point for these vessels as either apparently fishing or not fishing and shows the former on our public mapping platform.
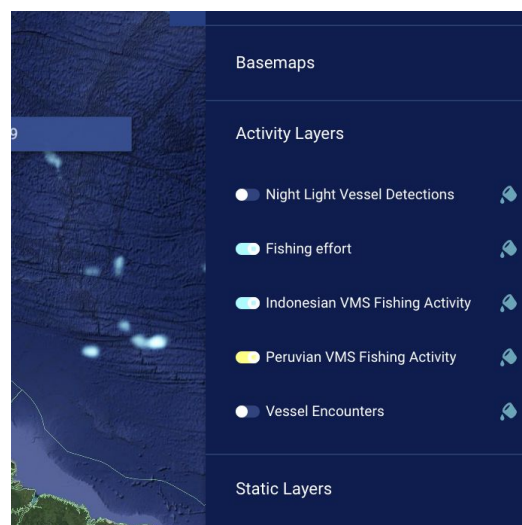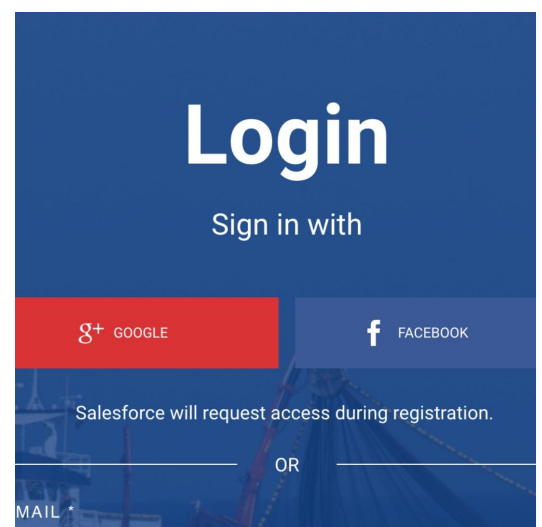
# Searching in Global Fishing Watch

Introduction to finding specific vessels and creating custom fleets in the Global Fishing Watch map.
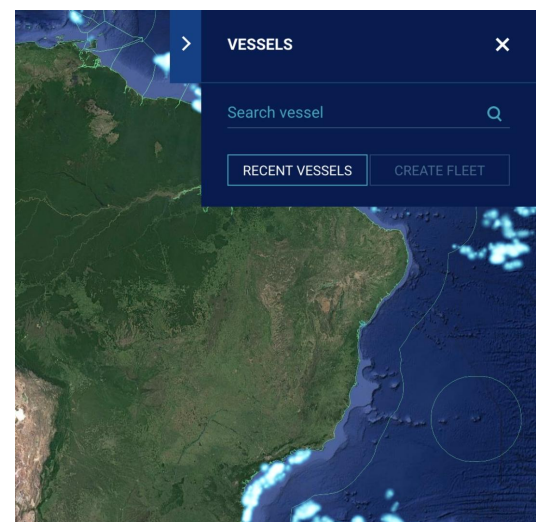
Log into your Global Fishing Watch account.

Click on the Vessels tab in the toolbox and enter the vessel identity information (vessel name, MMSI number, IMO number and callsign) in the search bar.

Make sure that the activity layer you are searching the vessel in is active. If not, you will not see any results.

The custom fleet feature lets you select and group a set of pinned vessels with the objective of seeing them move as a fleet in the map (represented with the same color).

First, search for or select the vessels you are interested in grouping as a fleet. Pin all vessels.

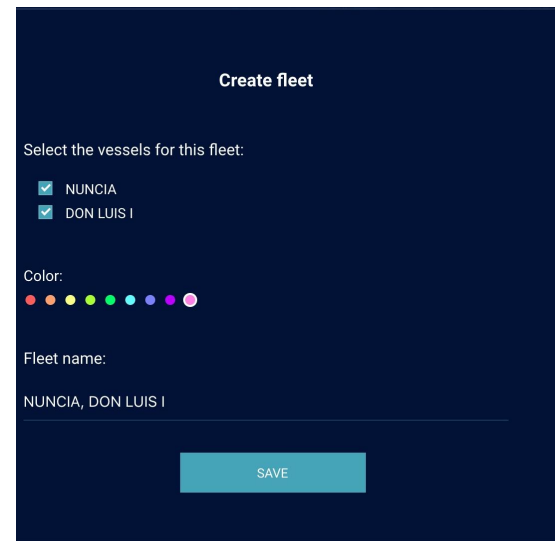You should see all pinned vessels under the vessels tab.
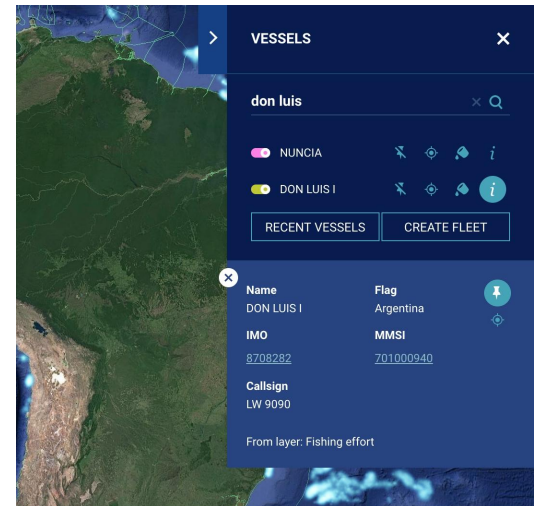
Click the `Create Fleet` button

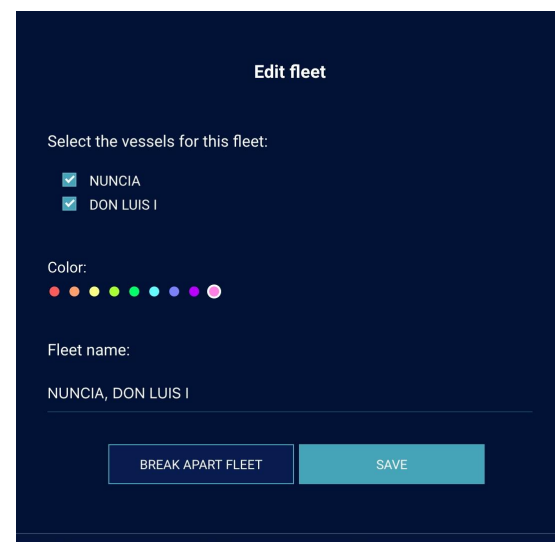Select the checkboxes of all vessels you want to include in the fleet.
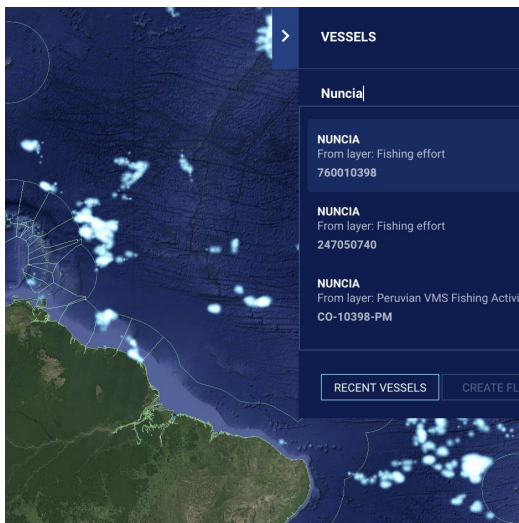
Customize the fleet name and color.

In case you want to remove the fleet you have created, click on the fleet edit button and then `Break Apart Fleet`.

Let's review with an example:

Search for 'Nuncia.'

Select your vessel. Sometimes there are multiple vessels with the same name, so you may need to know additional identity information to find the correct info. In this case, we're looking for MMSI 760010398.
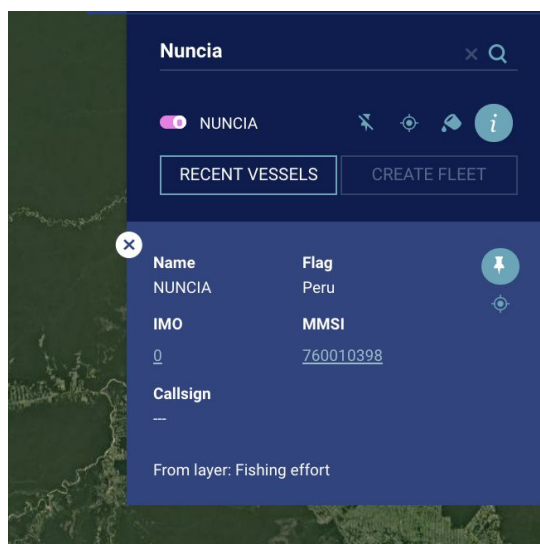
Clicking the compass icon will adjust the map viewport and time slider to fit the vessel tracks.

To change the color of a vessel track, click on the paint can icon (appears once a vessel is pinned).

To save this vessel, click the pin icon. Note that you can pin multiple vessels at once.

Click play on the timeline at the bottom to view the Nuncia's fishing movements up and down the coast of South America.

# Understanding fishing activity using AIS and VMS data

Introduction to the AIS and VMS activity layers in the Global Fishing Watch maps. AIS and VMS. AIS is a monitoring system or larger international fishing vessels while VMS focuses more on smaller ships fishing within national waters.
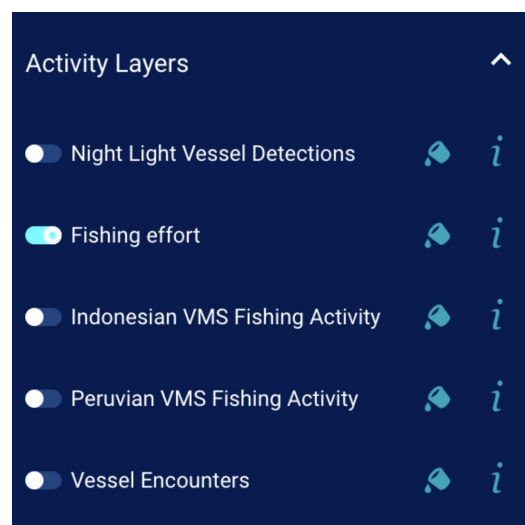
To view AIS data:

Under 'Layers' in the toolbox, open 'Activity Layers' to view options for vessel activity to be displayed on the map. Fishing effort refers to AIS data.
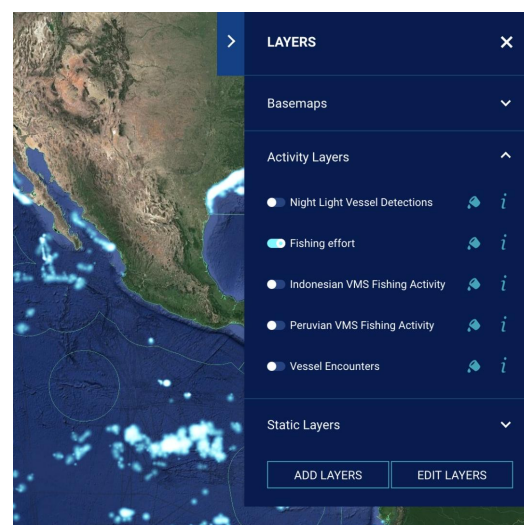
To activate a layer, click on the toggle to the left of the layer. The toggle will appear colored once the layer is activated.

To change the color of the layer on the map, click the paint can, and to get more information about the layer, click the 'i' icon.
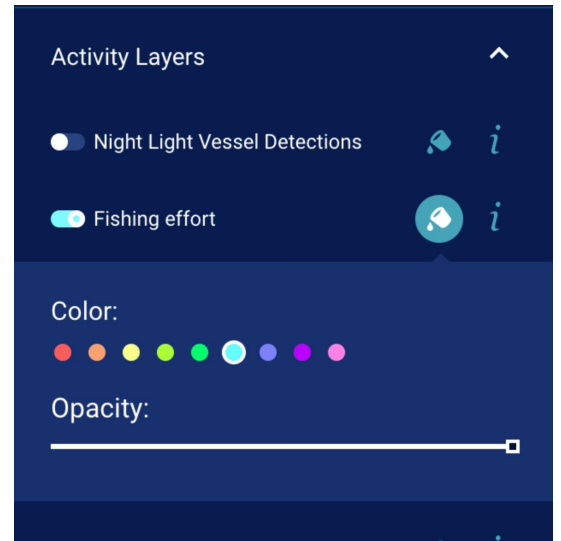
To search for VMS data:

VMS data are also available under 'Activity Layers' and listed by country. The nature of VMS sharing means that the periodicity of each country's data differs. Click the 'i' icon to learn more.
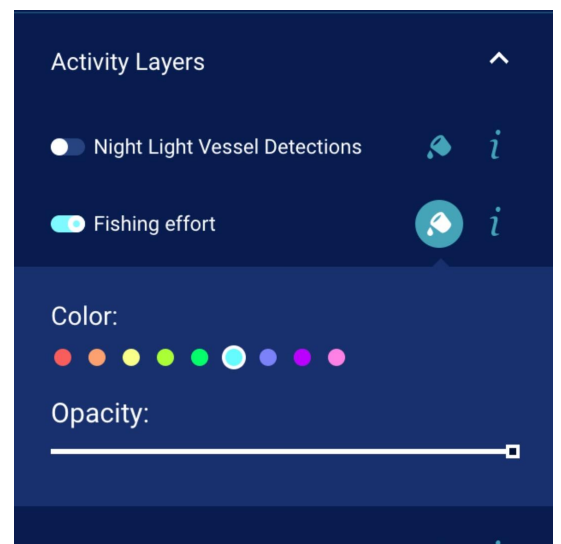
You will see that with some of the VMS data specific vessel identifiers have been redacted. This data can only be released publically with the permission of the flag state.
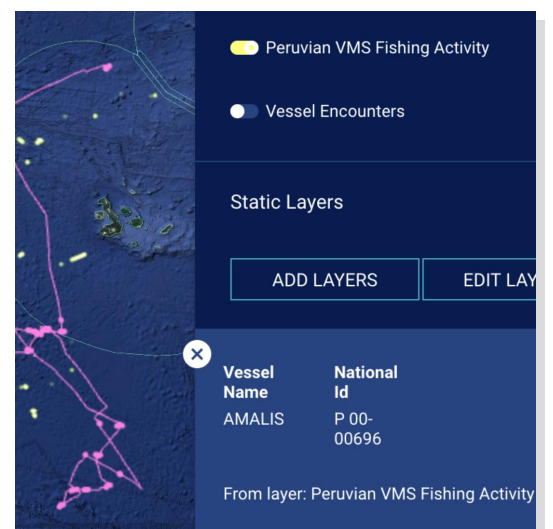
Individual vessel tracks for AIS and VMS data can be compared by pinning the vessel under both layers:

Turn 'Fishing effort' on and all other activity layers off. (A vessel search will only yield results from activity layers selected.)
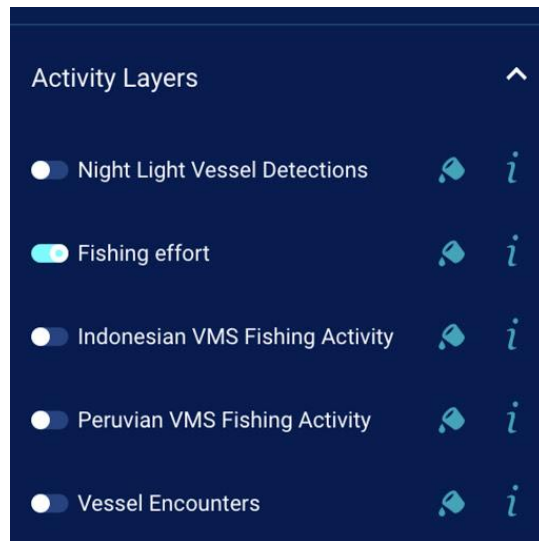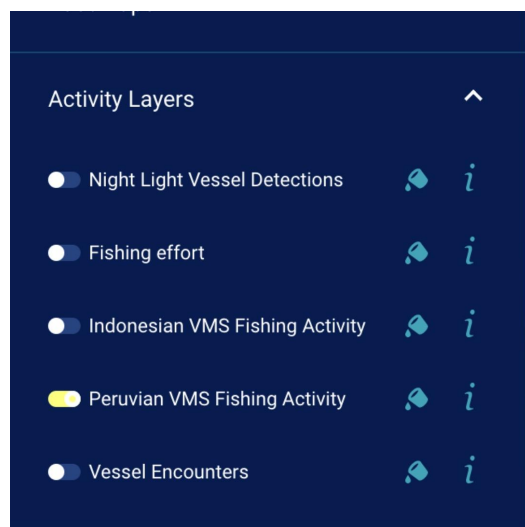
Open the Vessels tab and search for and pin Liafjord.
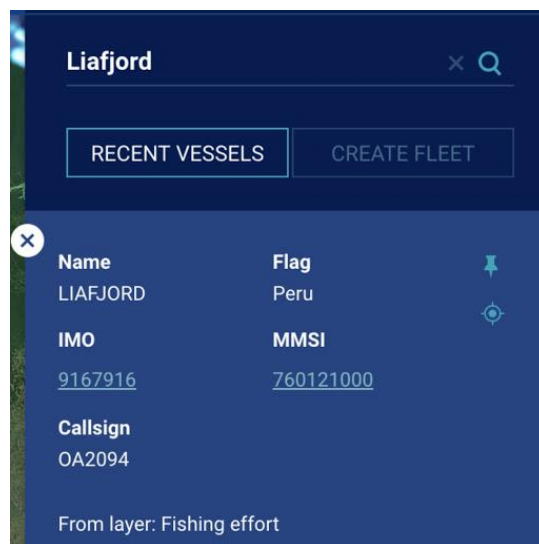
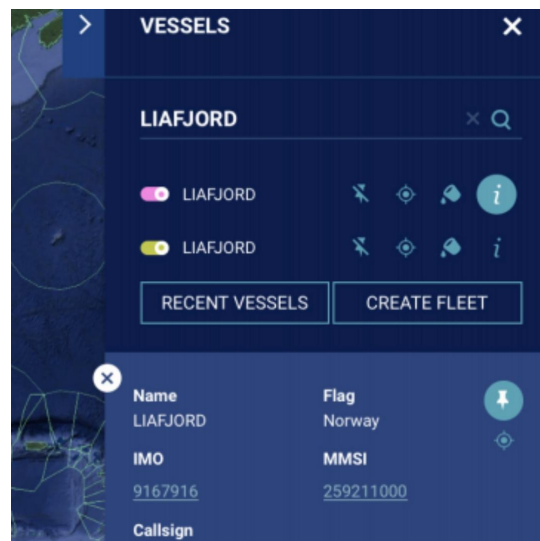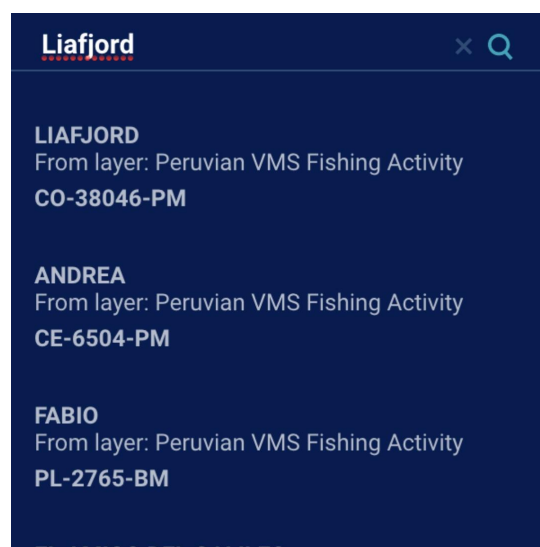Open the 'Layers' tab again and turn 'Peruvian VMS Fishing Activity' on and all other activity layers off.

Open the Vessels tab again and search for and pin
Liafjord.

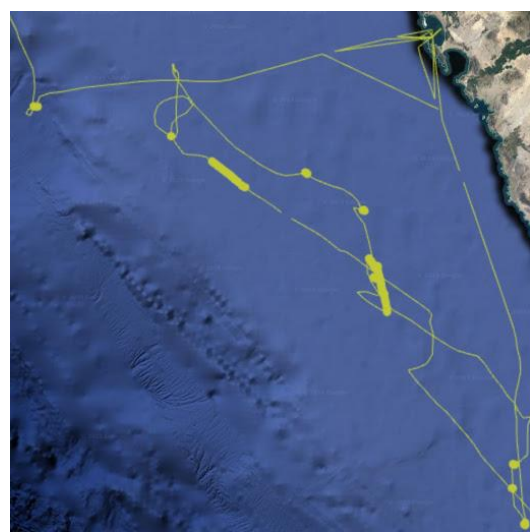Open the Activity Layers and deactivate Peruvian VMS
data. This will provide a clearer view of the vessel tracks

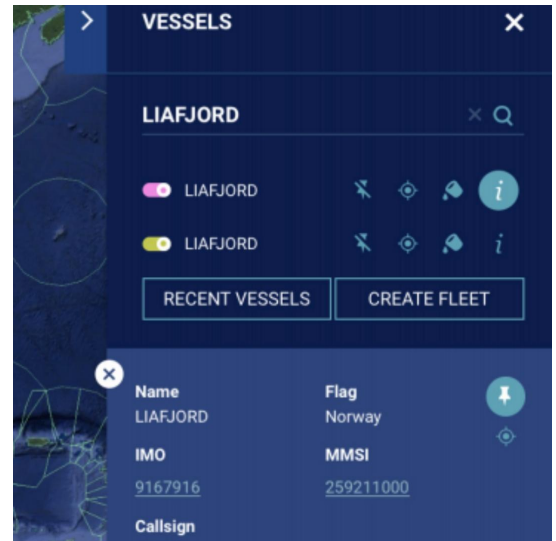In the Vessels tab, click the compass icon to center your
map around the Liafjord's activity.

Hit play on time slider to play the vessel tracks and AIS/VMS data. You can see the discrepancies in what the layers record.

# Understanding VIIRS data

Learn to interpret VIIRS, or Visible Infrared Imaging Radiometer Suite, data in our map.

The VIIRS satellite sensor can identify bright lights at night. In the dark ocean, vessels using bright lights stand out to this sensor and can be tracked. Some forms of fishing, such as squid jigging, use bright lights at night and squid fleets can be easily seen in the VIIRS data.
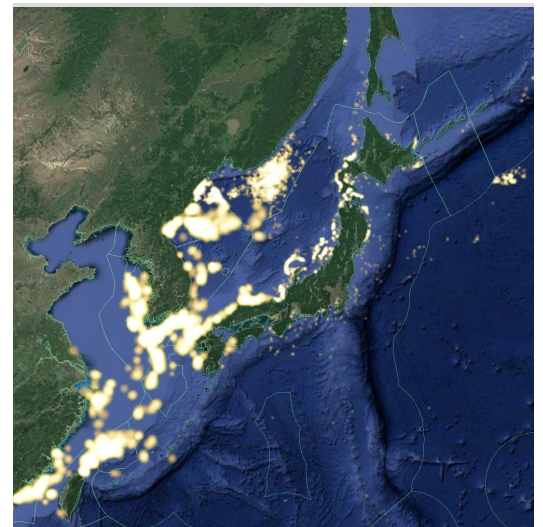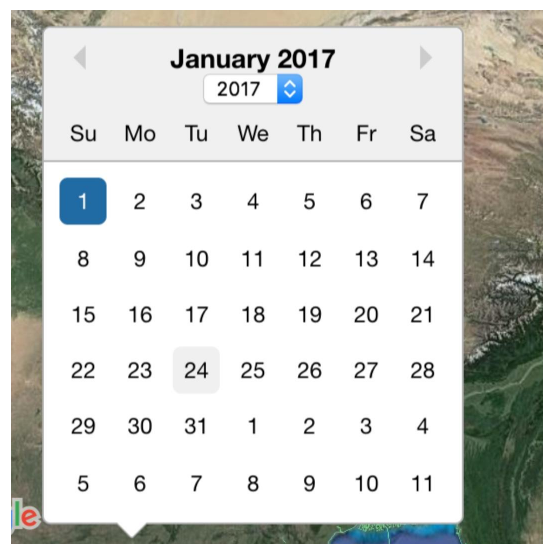
Some fishing vessels are not required to use vessel tracking systems such as AIS. However, if they are fishing using lights, they will be detected by VIIRS. To find these, click on 'Layers," then 'Activity Layers.'
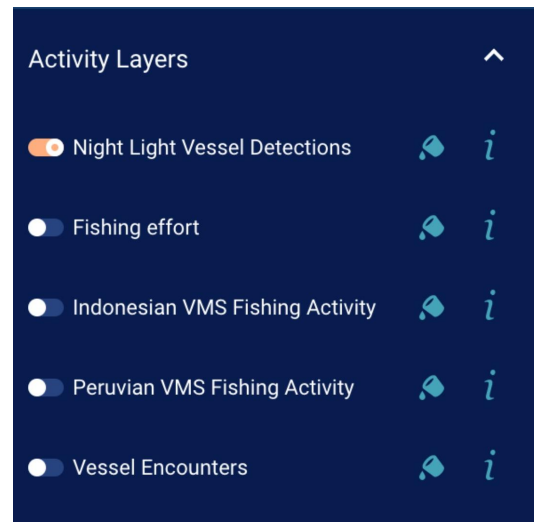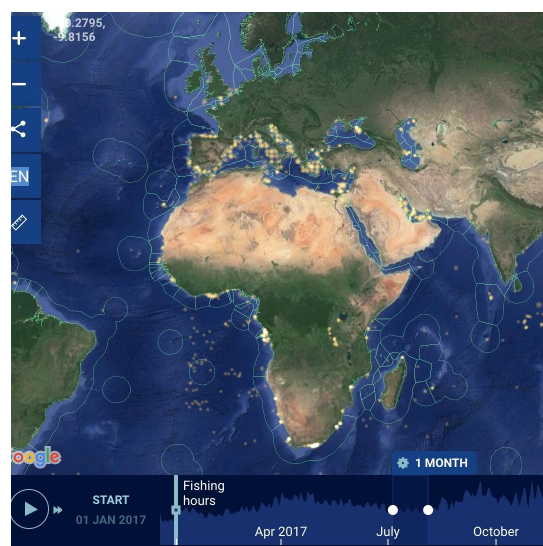
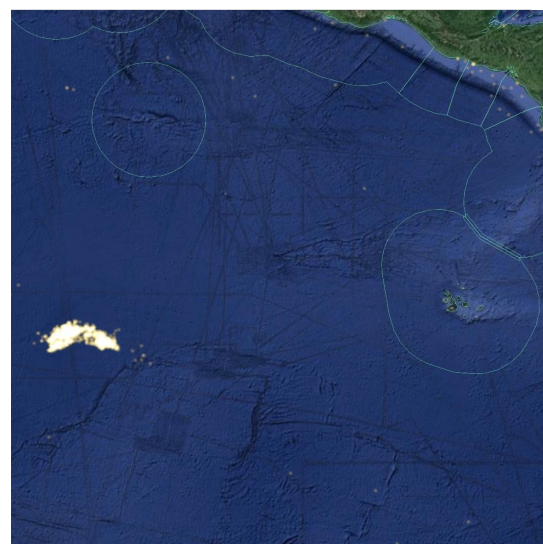Activate 'Night Light Vessel Detections' and 'Fishing effort.' Select a start date of January 1, 2017.

Zoom out to the global level and press play to view the difference between fishing activity detected in these two datasets.

Now select a start date of July 1, 2018.  Zoom in on the Galapagos islands.

Note that a group of vessels is detected only with VIIRS data and not AIS.

A few caveats are necessary for understanding these detections. One is that not all are actually fishing vessels – some may be other large vessels. Also, many vessels fish without lights, or with dim lights and would not show up in this dataset. Finally, there are false positives - places where the algorithm detects a light, but which result from errors or noise. There are also some cases of the algorithm picking up airplanes on international flights, although these are rare.
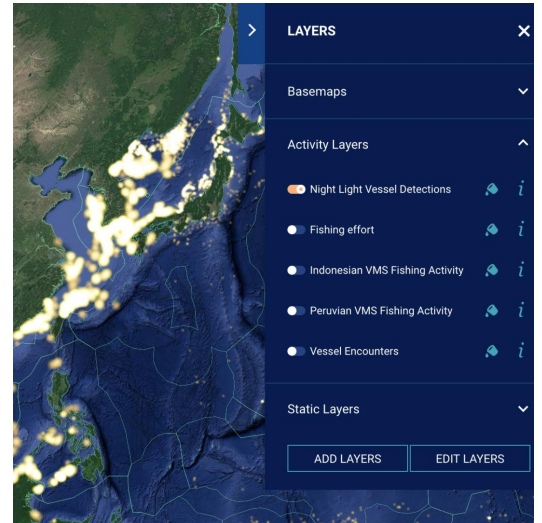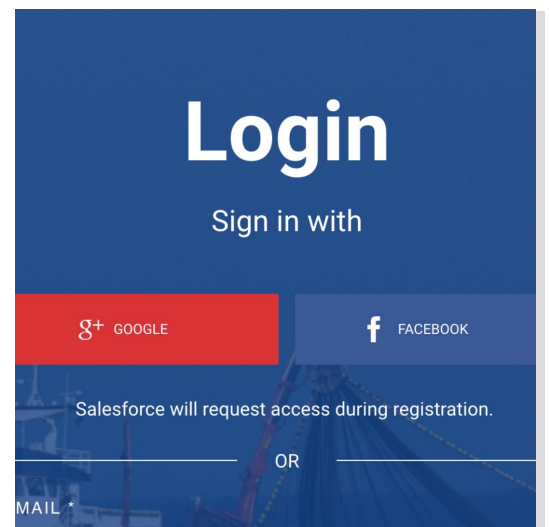
# Downloading Reports

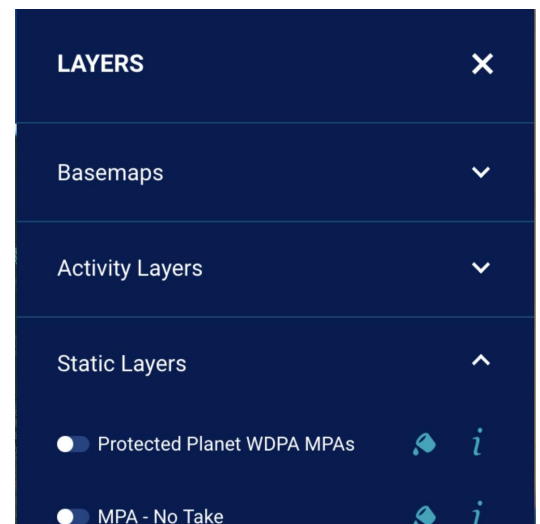Learn how to create a downloadable report of fishing activity.

First, you must be logged into your Global Fishing Watch account to create a report of fishing activity.

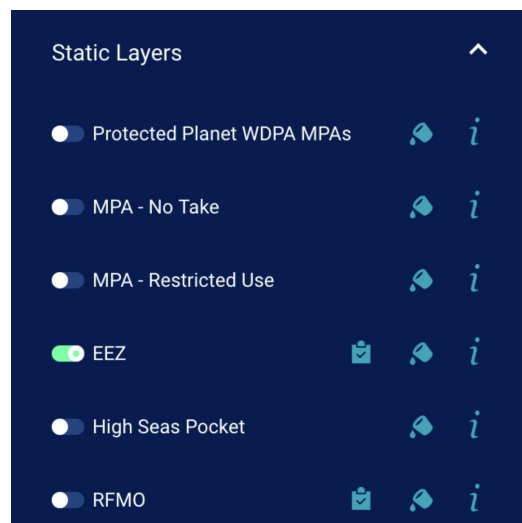In the map toolbox, open the 'Layers' tab, then on 'Static Layers.'

Click the report icon (closest icon to the layer name) for the layer you are interested in observing Exclusive Economic Zone (EEZ)  or Regional Fisheries Management Organisations (RFMO). The report icon will turn white when selected.
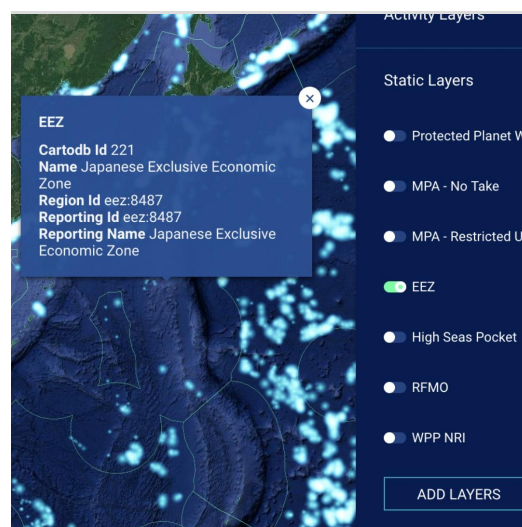
Click within the area you are interested in (e.g. within the EEZ or RFMO).
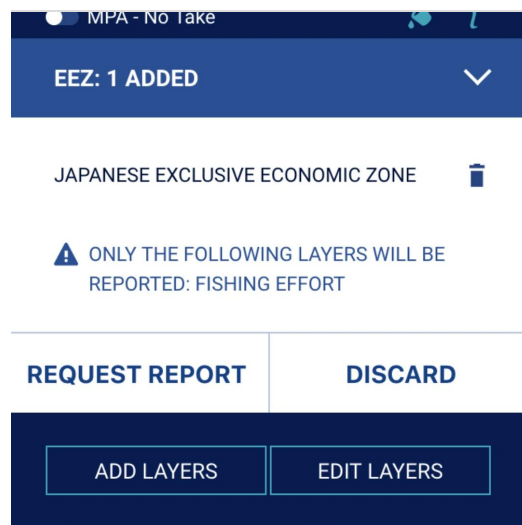
A pop-up box will appear with the name of the area you have selected. Click '**Add to report**'.
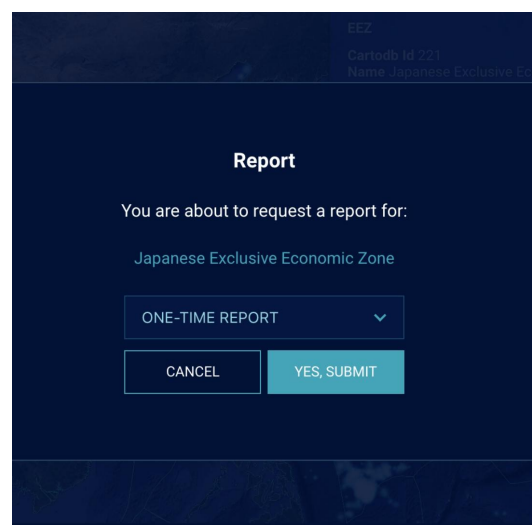
You may select multiple regions.
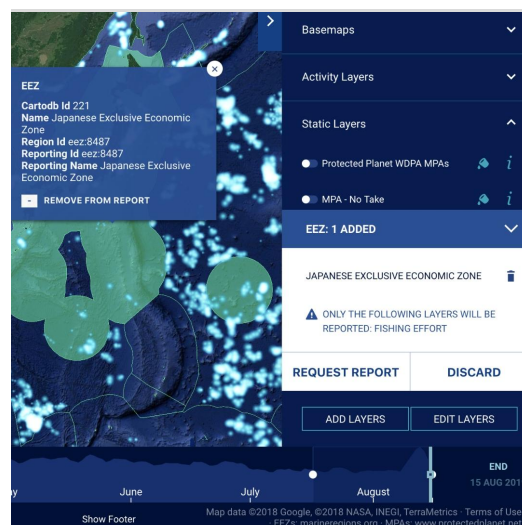
In the toolbox, click '**Request Report**.'

Select the frequency at which you would like to receive reports for the area.

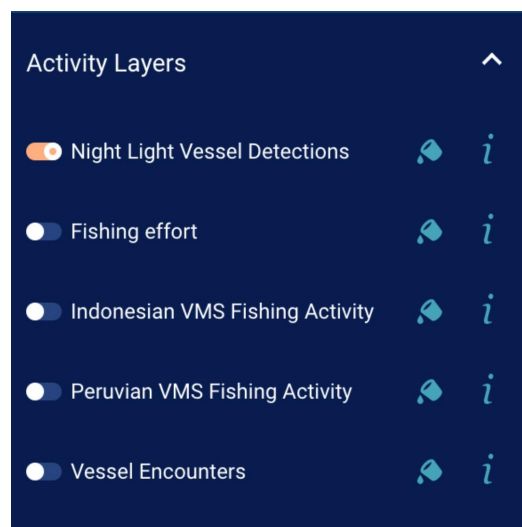The report will be emailed to you as an attached file in a few minutes.

# Filtering Fishing Activity

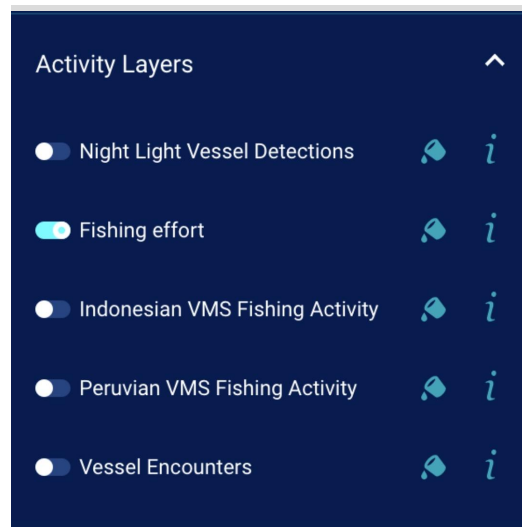Learn how to filter fishing activity by flag state or gear type.

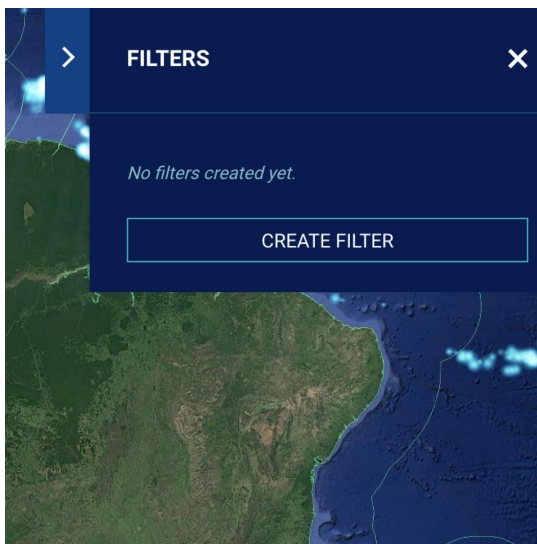To filter by flag state, first click **'Layers**,' then **'Activity Layers'**.

Activate **'Fishing effort**.'

Click on '**Filters.**'
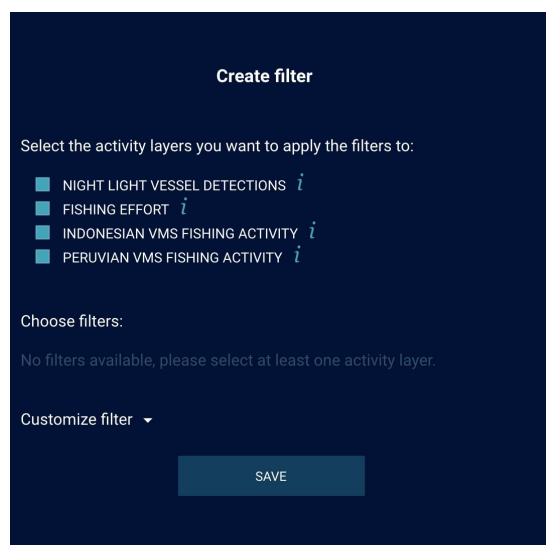
Click '**Create filter**.'
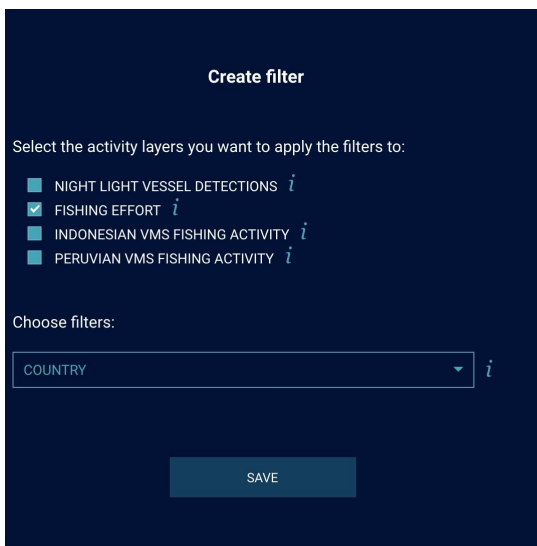
Select '**fishing effort**.'

Select **Argentina** under 'Country.'
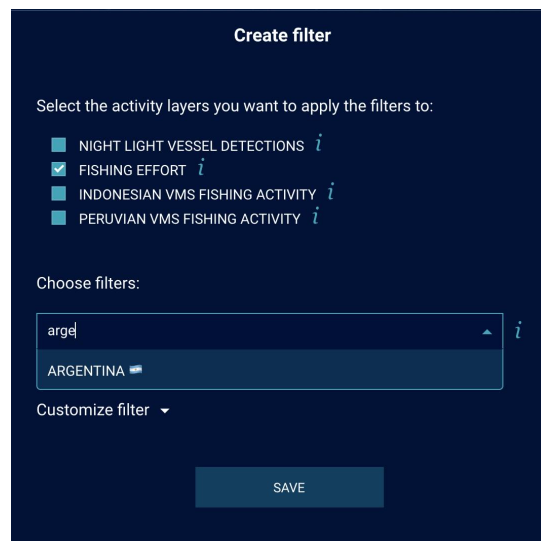
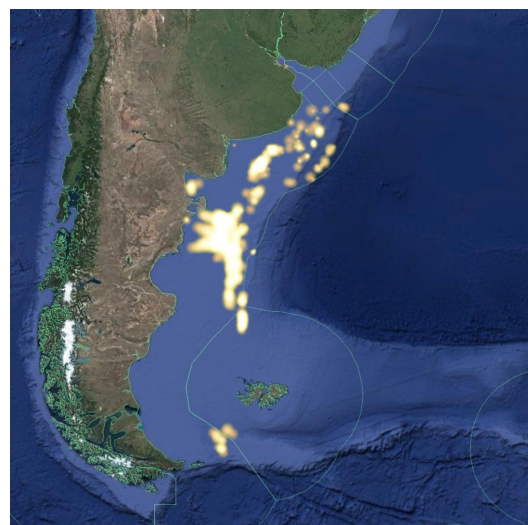Click **'Save**.'
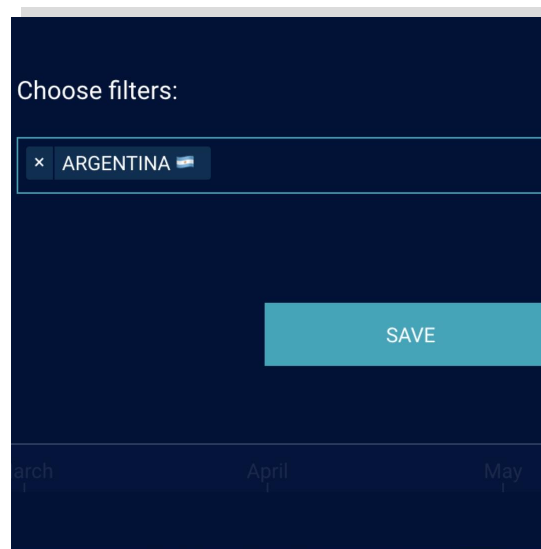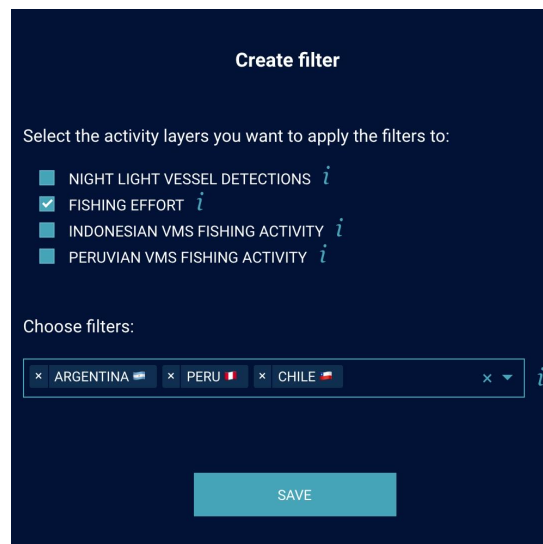
Scroll around Argentina to view fishing activity from Argentine vessels. Click **play** to view Argentine fishing effort over time.

To compare Argentina's fishing effort with another country's, repeat steps 3-4 for that country.

Repeat steps 3-4 with Peru and Chile.

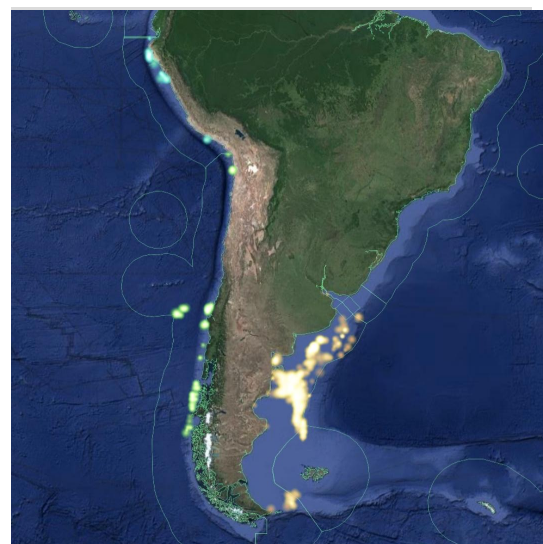Select a different color for each flag state.
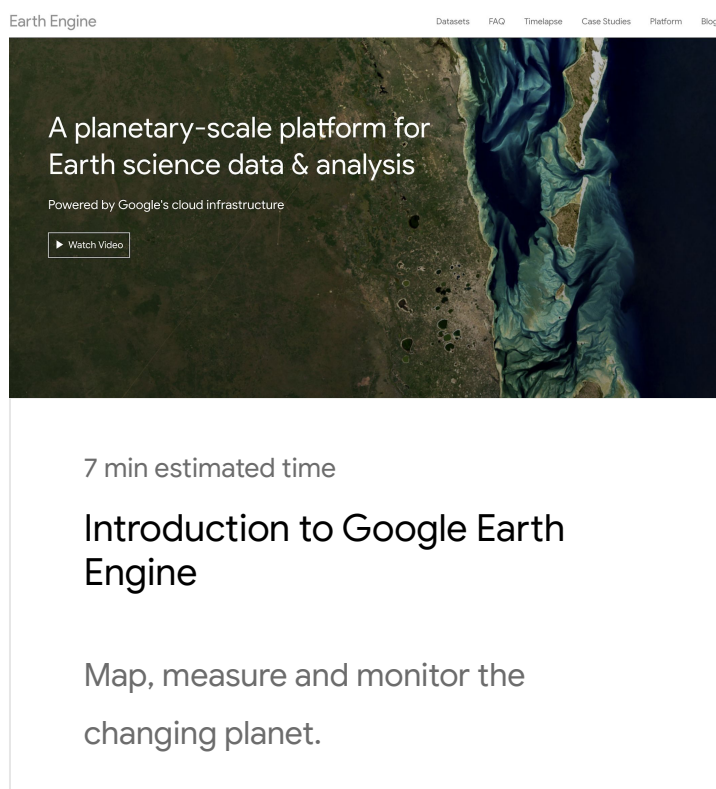
Press **play** to view fishing activity of these three flag states

# Congratulations!

You completed "Global Fishing Watch:
Monitor fishing fleets and vessels."

To continue building your digital journalism skills and work toward Google News Initiative certification, go to our Training Center website and take another lesson:



7 min estimated time

## Introduction to Google Earth Engine

Map, measure and monitor the

changing planet.

For more Environmental Journalism lessons, visit:

newsinitiative.withgoogle.com/training/course/environmental-journalism

LESSON 04

# Introduction to Google Earth Engine

Use a multi-petabyte library of satellite imagery and data to detect changes, map trends, and quantify differences on Earth's surface.

# Lesson overview

## Introduction to Earth Engine

Earth Engine combines a multi-petabyte catalog of analysis-ready satellite imagery and remote sensing data with Google-scale computation, which allows you to perform planetary-scale analysis -- all from within your browser.

Using Earth Engine you can track surface temperature, changes in vegetation coverage and even biodiversity.
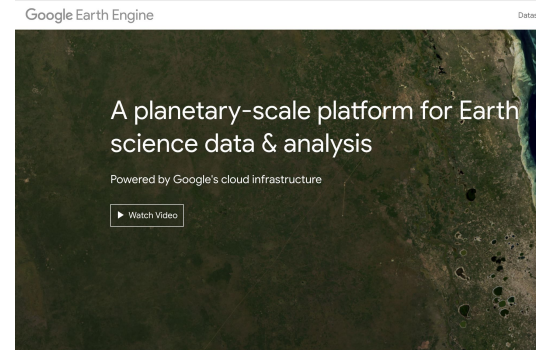


Meet Earth Engine

| 1 | Introduction to Earth Engine |
|---|---|
| 2 | The Earth Engine Data Catalog |
| 3 | The Earth Engine Code Editor |
| 4 | Creating a thumbnail gif |
| 5 | Exporting a video from Earth Engine |

For more Environmental Journalism lessons, visit:

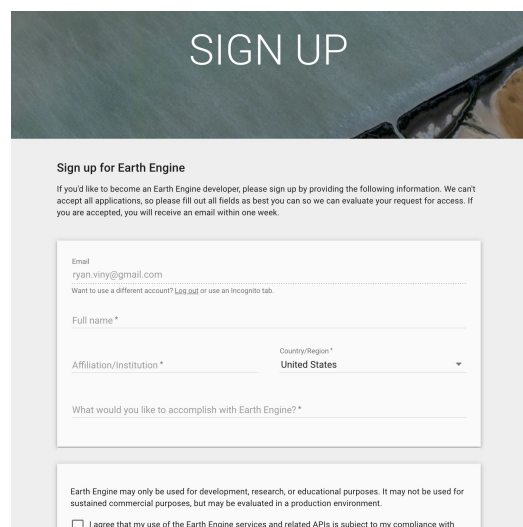newsinitiative.withgoogle.com/training/course/environmental-journalism

# Introduction to Earth Engine

Earth Engine is an incredibly powerful tool for monitoring the environment. The tool has been designed for geographers, scientists and researchers to allow them to quickly access and analyse more than 600 remote sensing datasets, including satellite imagery spanning from the 1970's to today.

.

Google Earth lets you travel, explore, and learn about the world by interacting with a virtual globe. Earth Engine, on the other hand, is a tool for analyzing geospatial information. You can analyze forest and water coverage, land-use change, or even assess the health of agricultural fields.

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**STEP 1 OF 2**

To use Google Earth Engine you first have to sign up using a gmail account. Go to signup.earthengine.google.com and follow the steps to sign up for Earth Engine. Applications are reviewed and can take up to a week to be processed.
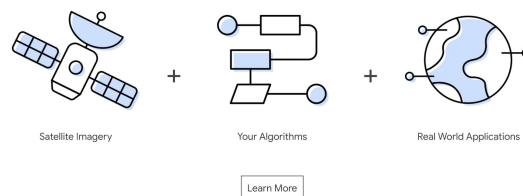
---

**STEP 2 OF 2**

Once you have signed up and been accepted to use Earth Engine you can begin to explore the tools capabilities.

Once you've been accepted, you'll be able to access the Earth Engine Code Editor, the browser-based interactive development environment for Earth Engine analyses: code.earthengine.google.com.

# The Earth Engine Data Catalog

Earth Engine has an extensive database of satellite imagery and remote sensing data. The different datasets have all been tagged and each has a ready-to-use code sample that allows you to instantly open it in the Earth Engine Code Editor and begin exploring and analyzing the dataset.

To access the Earth Engines datasets click on that Datasets tab on the Earth Engine homepage or navigate to developers.google.com/earth-engine/datasets/
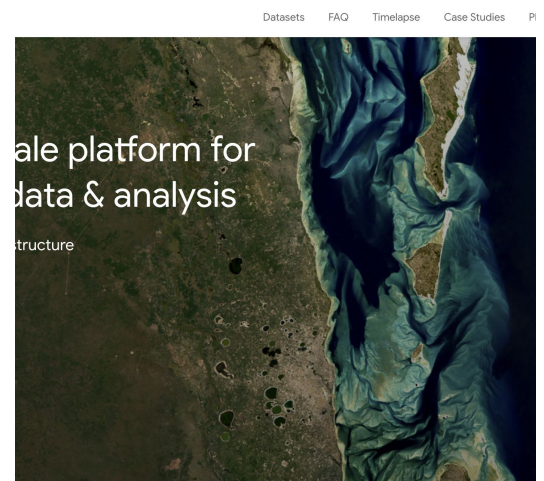
The Data Catalog gives you a number of options. You can view all datasets, browse by tags, or access datasets based on the satellite program they were created by.
Landsat: the longest-running enterprise for acquisition of satellite imagery of Earth.
Modis: Moderate Resolution Imaging Spectroradiometer that was launched into Earth's orbit in 1999.
Sentinel: is part of Copernicus is the European Union's Earth observation programme
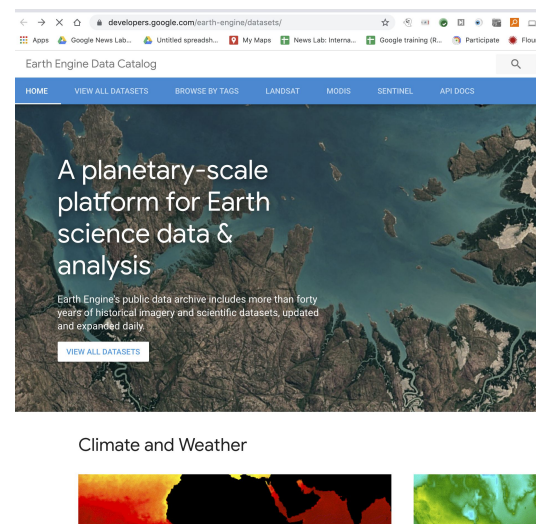
Select 'Browse by tags'
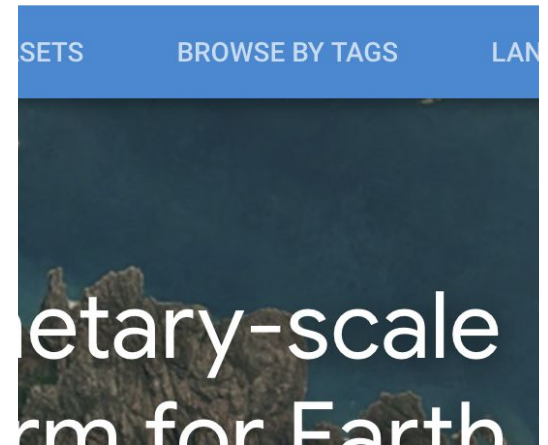
With in the browse by tags category there is access to all the datasets tagged by where they were produced, what they contain and what they can be used for. Select the NDVI dataset, which stands for normalized difference vegetation index.

Once you click on NDVI you are taken to a library of all of the datasets which contain NDVI subsets. Each dataset has an image as well as a description of what it contains. Below the descriptions is the list of tags that have been added to that dataset.
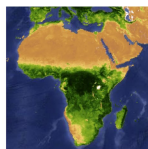
Find and click on MYD13Q1.006 Aqua Vegetation Indices 16-Day Global 250m

You are now in the dataset. The information box at the bottom contains information on:

Bands: the different types of imagery within the set
Terms of use: the licensing

Citations: How to cite the data correctly

At the bottom of the page is a code snippet. This is a javascript snippet that if you click the "**OPEN IN CODE EDITOR**" button will open a new window with Earth Engine running.

MYD13Q1.006 Aqua Vegetation Indices 16-Day Gl

**Dataset Availability**

2000-02-18T00:00:00 - Present

**Dataset Provider**

NASA LP DAAC at the USGS EROS Center

**Earth Engine Snippet**

ee.ImageCollection("MODIS/006/MYD13Q1")

**Tags**

vegetation   ndvi   evi   modis   myd13q1   16-

global   aqua   usgs   nasa

| DESCRIPTION | BANDS | TERMS OF USE | CITATIONS | DOI(S) |

The MYD13Q1 V6 product provides a Vegetation Index (VI) value at a per pixel basis. There are two primary vege
(NDVI) which is referred to as the continuity index to the existing National Oceanic and Atmospheric Administrati
NDVI. The second vegetation layer is the Enhanced Vegetation Index (EVI) that minimizes canopy background va
EVI also uses the blue band to remove residual atmosphere contamination caused by smoke and sub-pixel thin c
atmospherically corrected bi-directional surface reflectances that have been masked for water, clouds, heavy aer

Explore in Earth Engine

```
var dataset = ee.ImageCollection('MODIS/006/MYD13Q1')
                .filter(ee.Filter.date('2018-01-01', '2018-05-01'));
var ndvi = dataset.select('NDVI');
var ndviVis = {
  min: 0.0,
  max: 8000.0,
  palette: [
    'FFFFFF', 'CE7E45', 'DF923D', 'F1B555', 'FCD163', '99B718', '74A901',
    '66A000', '529400', '3E8601', '207401', '056201', '004C00', '023B01',
    '012E01', '011D01', '011301'
  ],
};
Map.setCenter(6.746, 46.529, 2);
Map.addLayer(ndvi, ndviVis, 'NDVI');
```

OPEN IN CODE EDITOR

GitHub
Earth Engine on GitHub

Medium
Follow our blog on Medium

Stack Over
Ask questions
google-earth-en

# The Earth Engine Code Editor

The Earth Engine Code Editor is a web-based development environment for the Earth Engine JavaScript API. Code Editor features are designed to make developing complex geospatial workflows fast and easy.

The Code Editor allows a user to analyse satellite imagery from the Data Catalog. This powerful tool can be used to analyse, map, chart and even render out videos from the huge catalog of satellite imagery.

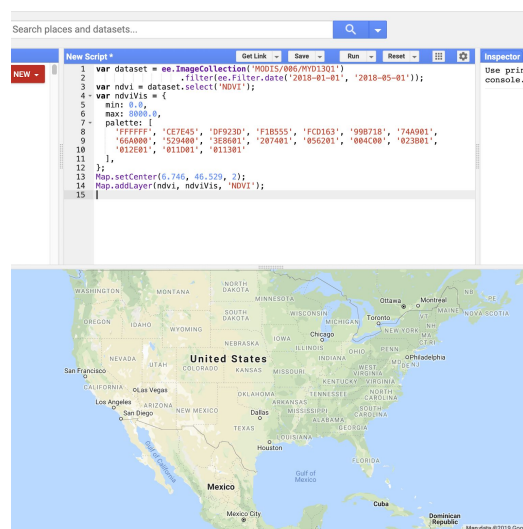If you have been following our guide you should now have the NDVI data set code sample opened in the code editor.

Click on the "Run" button at the top of the editor to execute the code sample, which will  render the dataset as a new layer on the world map.
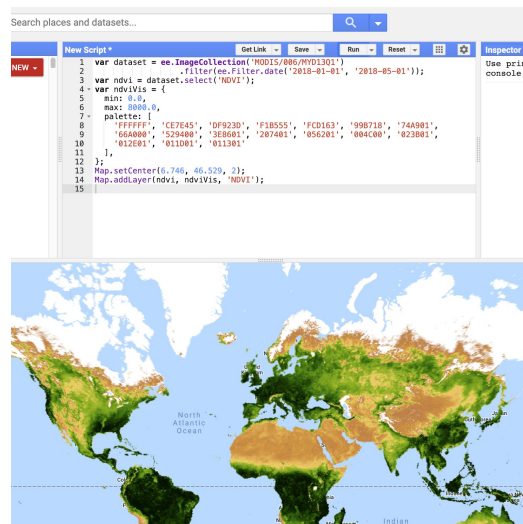
The code editor has now rendered the dataset on to the map. You can zoom in and pan on the map. In addition, by altering the code in the editor you can change the imagery displayed. If you change the dates where it says:

```
.filter(ee.Filter.date('2018-01-01',
'2018-05-01'));
```

You can alter the imagery that is displayed on the screen.

On the left side of the code editor is the Scripts manager. The scripts manager has code snippets that you can run in the editor to enable different features of Earth Engine. You can also save your work here by clicking NEW and then create a repository. Within the repository you can then save, share and track changes of folders and files that you are working on. The full documents on the code editor or available here.
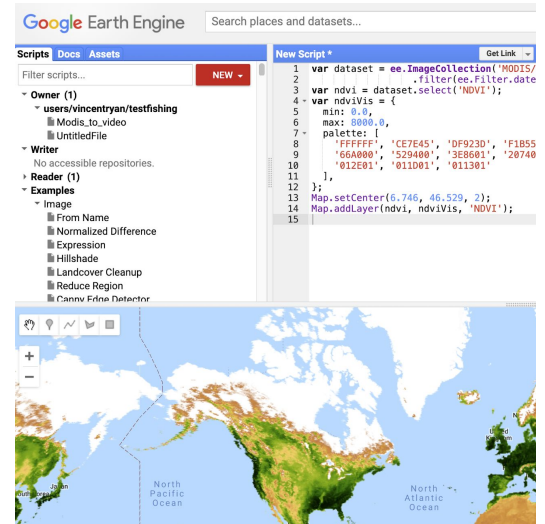
The search box at the top of the code editor allows you to search the Data Catalog. Get Link: Creates a unique link to the script that you are working on so that you can share it with others. 'Save' and 'Run' do as described while 'Reset' clears your code.
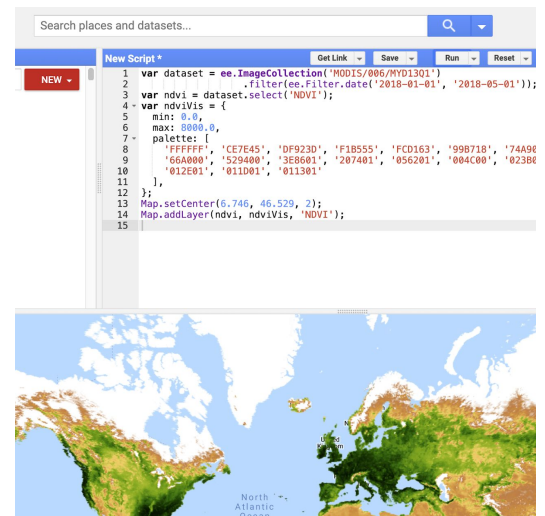
On the right of the code editor are the Inspector, Console and Tasks tabs. The Inspector tab allows you to use your cursor to examine the layers visible on the map. The Console tab is where objects appear if you use the `print()` in the code editor. The 'Tasks' tabs handles long computations such as videos, exporting static map tiles, or exporting analysis results as tables, GeoTIFFs, and other formats.
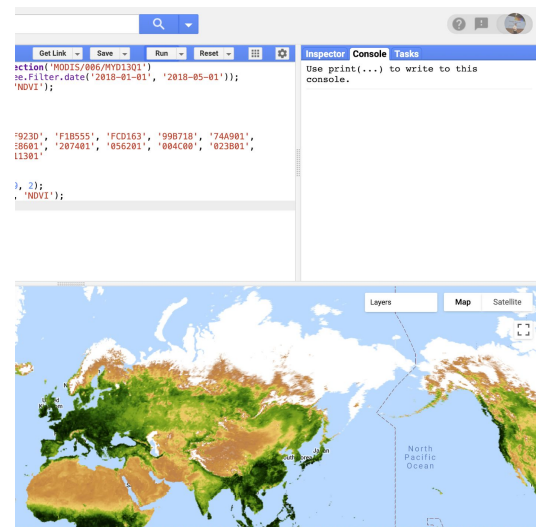
# Creating a thumbnail gif

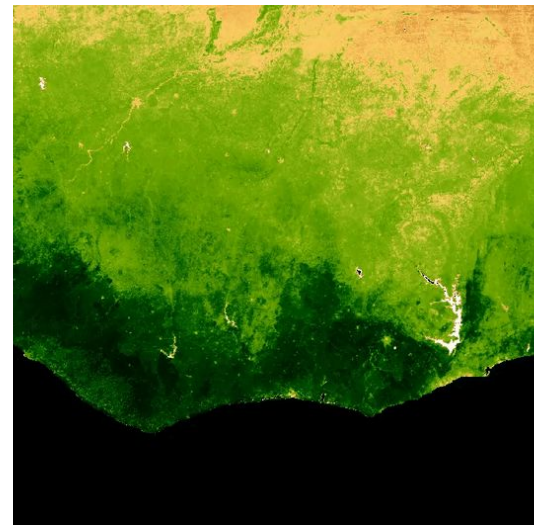Creating a thumbnail gif within Earth Engine lets you examine the satellite imagery quickly and easily before you choose to render anything to video.

This image on the left tracks the growth and retreat of vegetation in eastern Africa over the course of one year using data from the NDVI imagery we added to the code editor earlier.
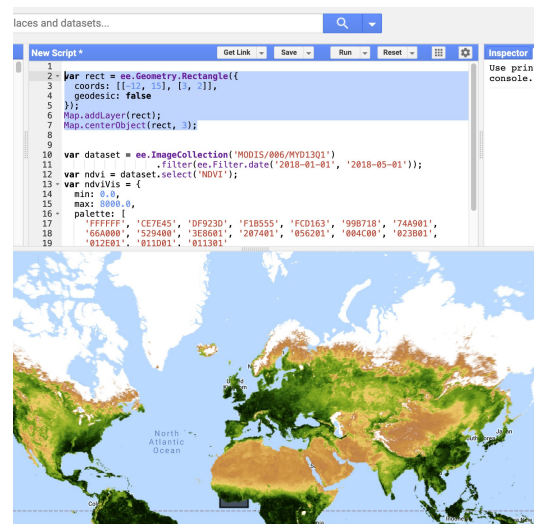
First we need to identify the area. Add this code above the dataset:

```
var rect = ee.Geometry.Rectangle({
  coords: [[-12, 15], [3, 2]],
  geodesic: false
});
Map.addLayer(rect);
Map.centerObject(rect, 3);
```

coords = the points of longitude and latitude to highlight. Click **run**.

Now that we have the area highlighted we need to prepare the images for the GIF animation, using the visualize() method, which converts the native pixel data into 8-bit RGB, suitable for use in exported videos or GIFs:
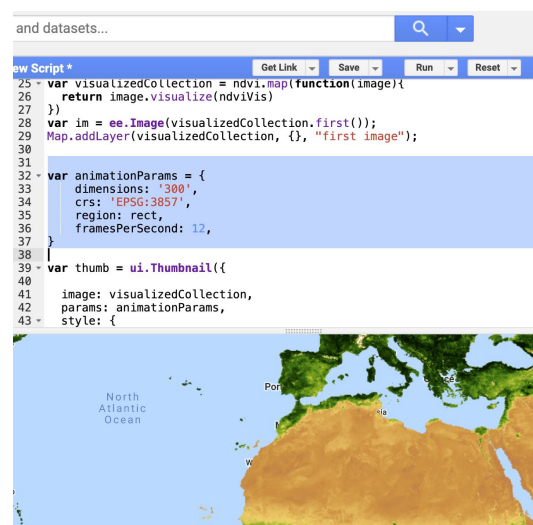
```
var visualizedCollection =
ndvi.map(function(image){
   return image.visualize(ndviVis)
})
var firstImage =
ee.Image(visualizedCollection.first());
map.addLayer(firstImage, {}, "first image");
```
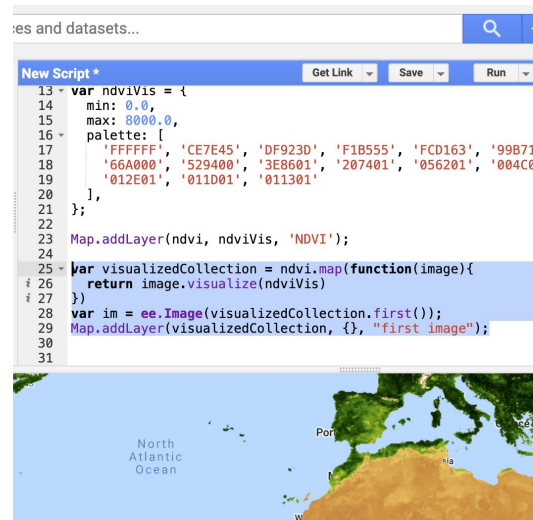
The second to last step is to specify the parameters for the animation:
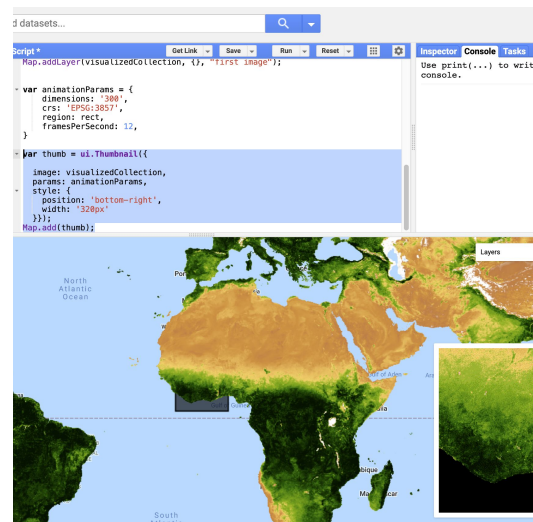
```
var animationParams = {
    dimensions: '300',
    crs: 'EPSG:3857',
    region: geometry,
    framesPerSecond: 12,
}
```

The final step is to create the thumbnail image and add it to the map:

```
var thumb = ui.Thumbnail({
  image: visualizedCollection,
  params: animationParams,
  style: {
    position: 'bottom-right',
    width: '320px'
  }});
Map.add(thumb);
```

Click **Run**

# Export a video from Earth Engine

Earth Engine allows you to render video directly out to your drive. While the thumbnail is limited to a short number of frames, by rendering to video you can create high resolution satellite video over a long time period.

To export to video add the following code:

```
Export.video.toDrive({
  collection: visualizedCollection,
  description: 'NDVIVideoExample',
  dimensions: 720,
  framesPerSecond: 12,
  region: rect
});
```

Click **Run**

As you are rendering out to a video this operation is created as a Task. If you go to the Tasks tab you will have created a Task that needs to be run to create the video. Once you click 'Run' a video will be rendered to your drive.

This link here will take you to saved version of this script

Note: Batch exports can take some time to complete. You can check the status of the export by looking at the Tasks tab. When the task completes, it will change color to blue.
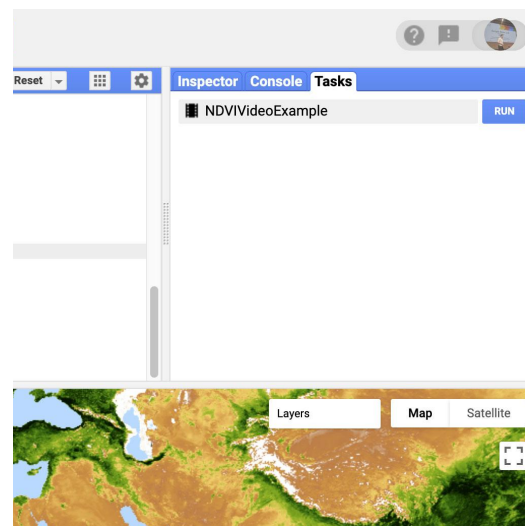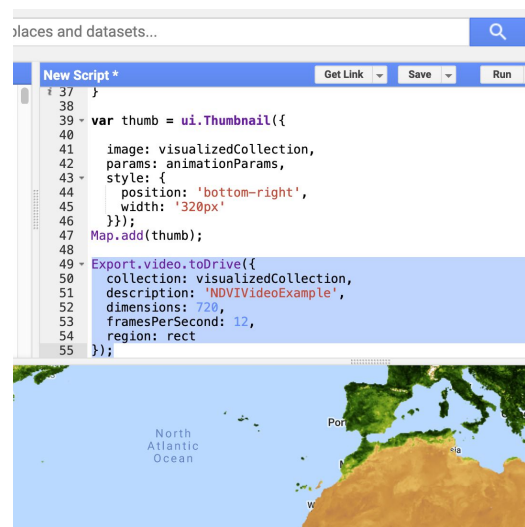
# Congratulations!

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