

How Make Maps and Fix GPS Coordinates in Samples

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Introduction

This document has been developed for HPOs to go through the process of ground truthing GPS coordinates and ensuring that they have been correctly entered into the online database. This document will cover, exporting samples from the database to KML. Opening the downloaded map in both versions of Google Earth, and how to use these downloaded maps to fix any GPS coordinates in the Online National Mosquito Surveillance Database.

This document assumes that Google Earth is being used to view the map and will cover both the desktop program (Google Earth Pro) and the browser version.

Exporting to KML

Log into the online database and select the “Export Sample Data to KML File” option from the menu (Figure 1) and complete the search parameters to export the data you want displayed on the map. The only information that is mandatory is the collection date to and from fields. Then select the “Export KML” tab at the bottom of the page, a file will automatically be download (Figure 2).

Home / Export Samples to KML

Select Database
Current

Health Board
Select Healthboard

Sample Creator
Select Sample Officer

Location
Location

Collection Date From
Collection Date From

Collection Date To
Collection Date To

GPS East
GPS East

GPS North
GPS North

Functions

- » New Sample
- » List Samples
- » List Site References
- » AdHoc Search
- » Upload Data
- » Export Sample Data To KML File
- » Quarterly Report

Figure 1: Export Sample Data to KLM

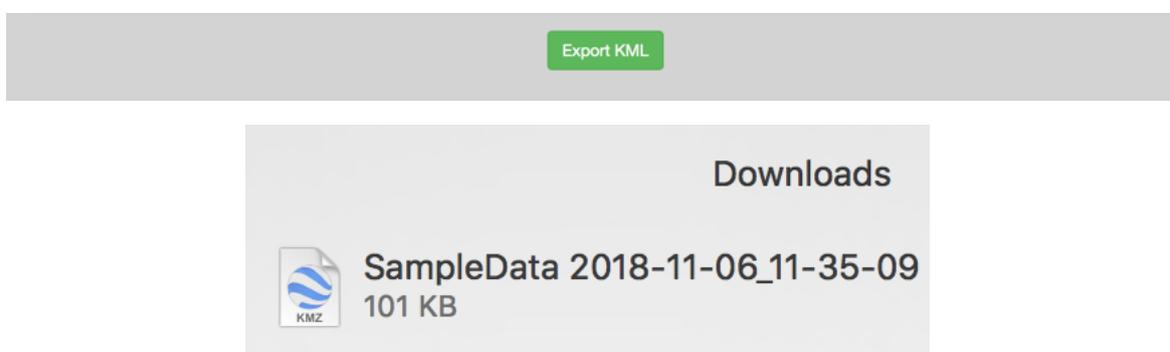


Figure 2: Export KLM button & File Downloaded

Opening KML File

Once the file has downloaded, you are ready to open it in whichever version of Google Earth that is being used. The steps are slightly different for each and instructions for both are below.

Opening with Google Earth Pro (desktop)

To view the files with Google Earth Pro, the programme must first be installed on the computer. There are two ways to open the file. The first is simply to click on the downloaded file and the samples will automatically open in the program.

The second is with Google Earth Pro open, go to “File” then “Import...” (Figure 3).

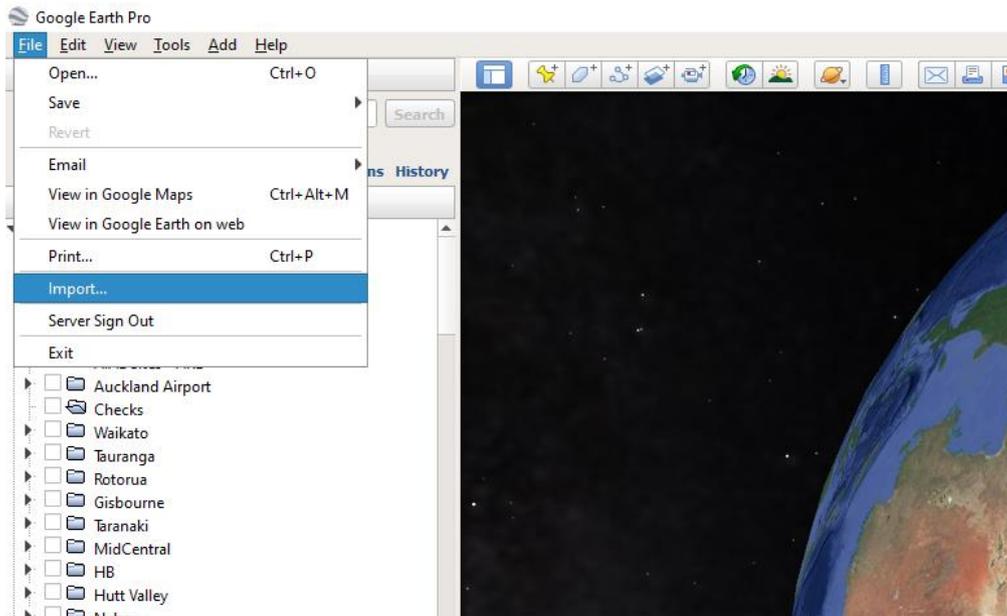


Figure 3: Use “File” and “Import...” to open your downloaded file in Google Earth Pro

In the dialog box that opens, navigate to the folder where your download has been saved. Along the bottom of the dialog box, change the file type from “Generic Text” to “All Files” to show the KML files. Select your download and click “Open” (Figure 4)

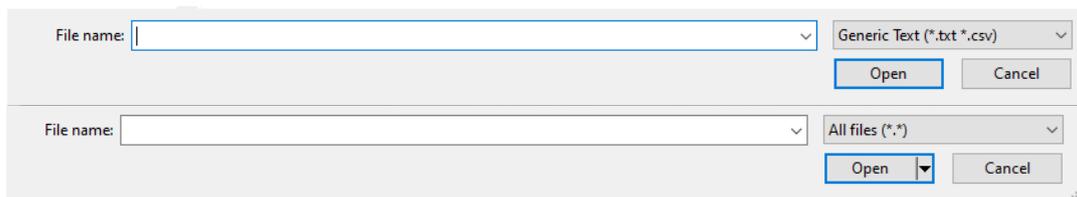


Figure 4: Change the file type from “Generic Text” to “All Files”

The samples that were in the selected parameters will be displayed with each sample represented by a pin.

Red pins – Samples with exotic mosquito species, Yellow Pins – Samples with non-exotic mosquito species and Green Pins – Negative samples (Figure 5).

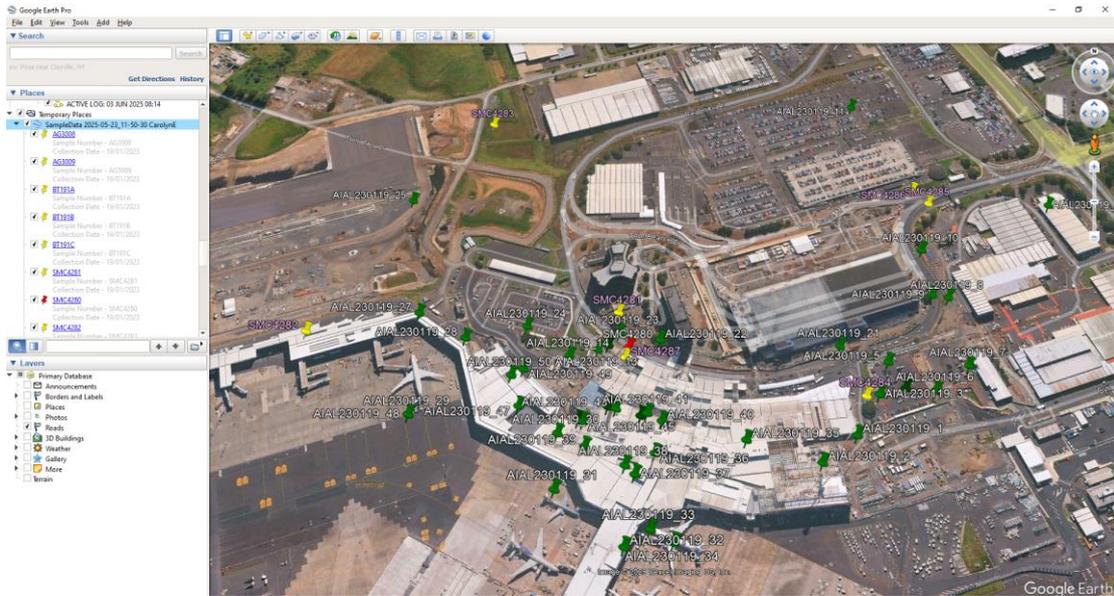


Figure 5: Samples displayed on the map in Google Earth Pro

Opening with Google Earth in a Browser

If the desktop version of Google Earth is not available, the samples can be opened using the browser version of the program in your preferred internet browser.

To open the downloaded file in the browser version of Google Earth, open the webpage for Google Earth, go to “File” then “Open local KML file” (Figure 6).

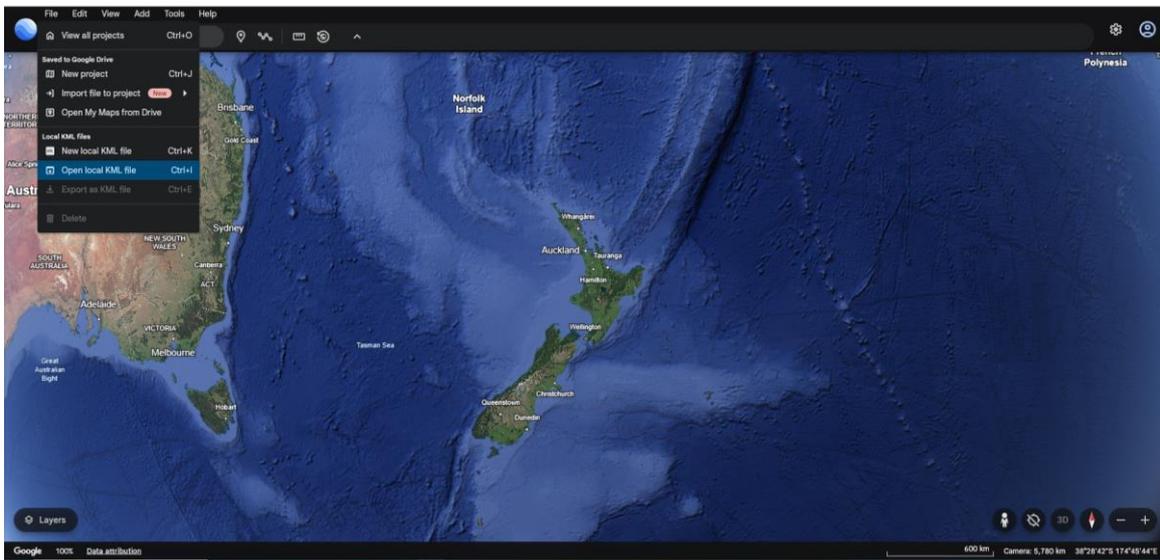


Figure 6: Use “File” then “Open local KML file” to open your downloaded file in the browser version of Google Earth

Find where the file is saved on the computer and select “Open”. The samples that were in the selected parameters will be displayed with each sample represented by a pin.

As with the desktop version: Red pins – Samples with exotic mosquito species, Yellow Pins – Samples with non-exotic mosquito species and Green Pins – Negative samples (Figure 7).

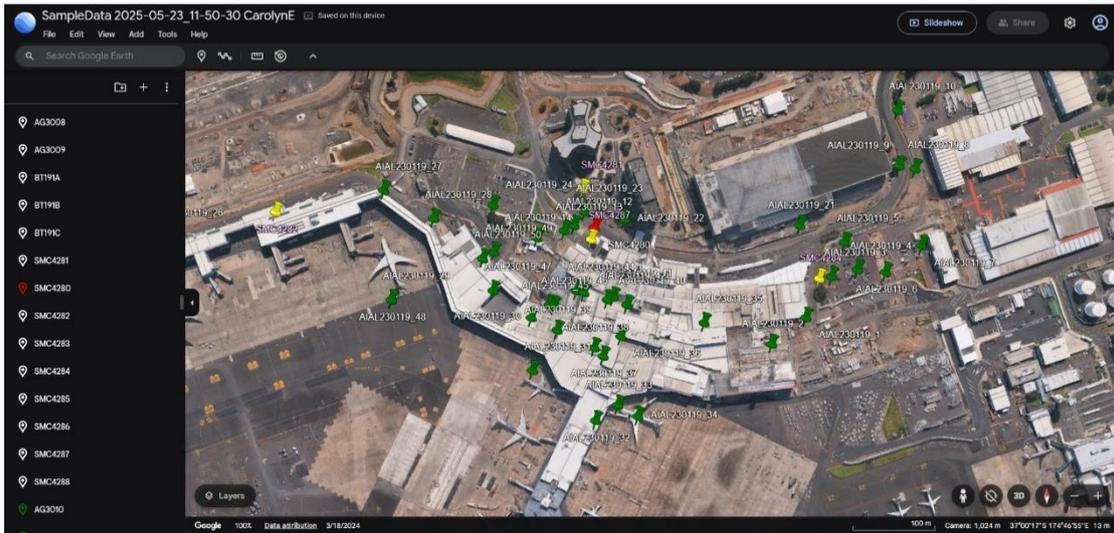
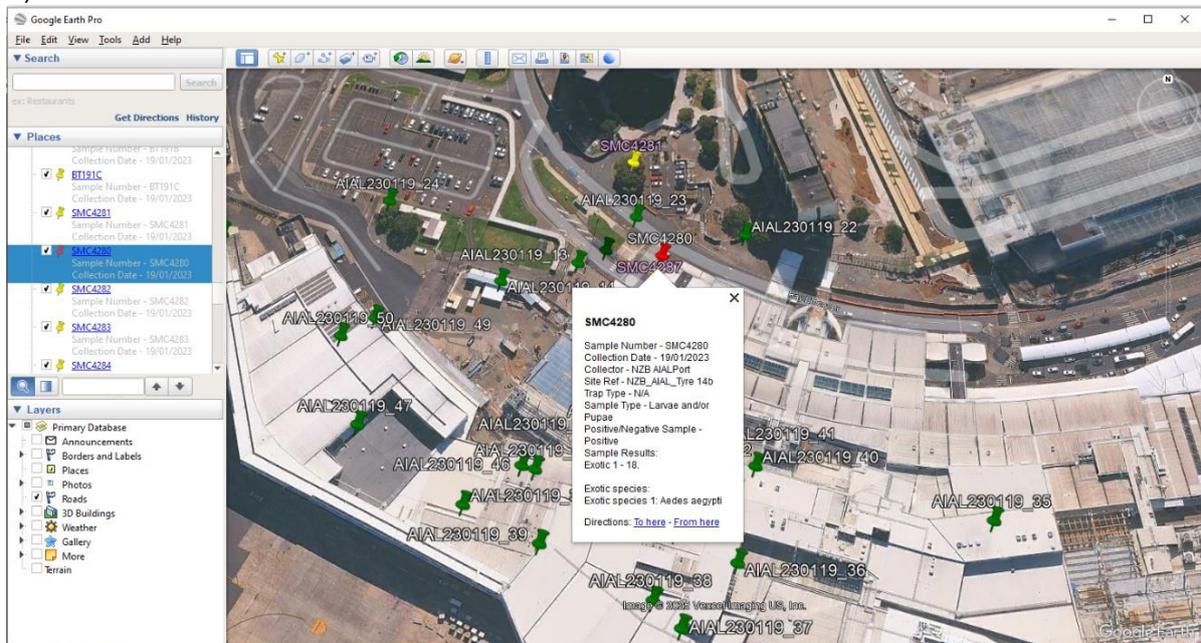


Figure 7: Samples displayed on the map in the browser version of Google Earth

Viewing Sample Information

You are able to view information such as the site reference, trap type, sample type, and a breakdown of species collected by clicking in the pin (Figure 8 and b). For the species breakdown, this will only display the total number of each species collected in the sample rather than the specific numbers of each of the larval instars and/or male and female mosquitoes.

a)



b)

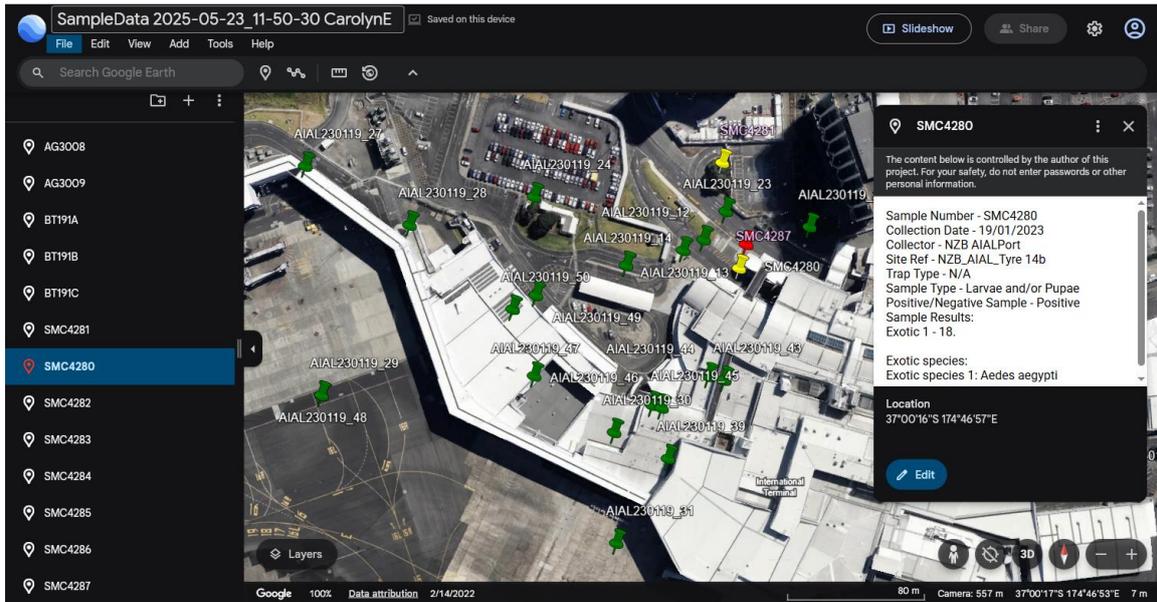


Figure 8. KLM Samples displayed in a) Google Earth Pro (desktop) and b) Google Earth (browser)

Incorrect Coordinates and How to Fix Them

There are many reasons why the pins on the map may be displayed in the incorrect locations. Most of these issues stem from two main things, the GPS coordinates have been incorrectly entered in the online database, or GPS drift has occurred when the coordinates were initially taken.

Any corrections to GPS coordinates will need to be made to both the sample and to the site reference. Correcting these in the site reference will ensure that future samples will also have the correct GPS coordinates. This can be done by going to “List Site References” and finding the appropriate sample in the list.

When exporting samples, the map will open to an average of all the samples taken within the parameters that were defined on export (Figure 9).

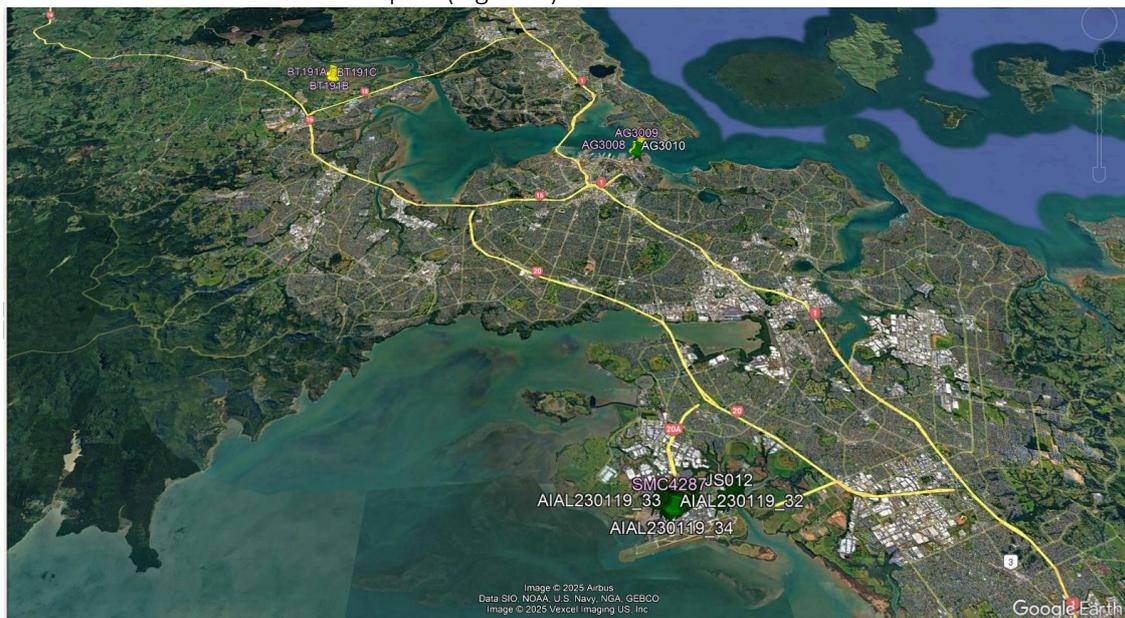


Figure 9: The map is displaying an average of all the samples taken in Auckland on a specific day

This can also be used to determine if any samples have had the GPS coordinates entered incorrectly. Depending on how the sample has been incorrectly entered, the average may encompass the city the sample was taken in, right through to the entire world (Figure 10).

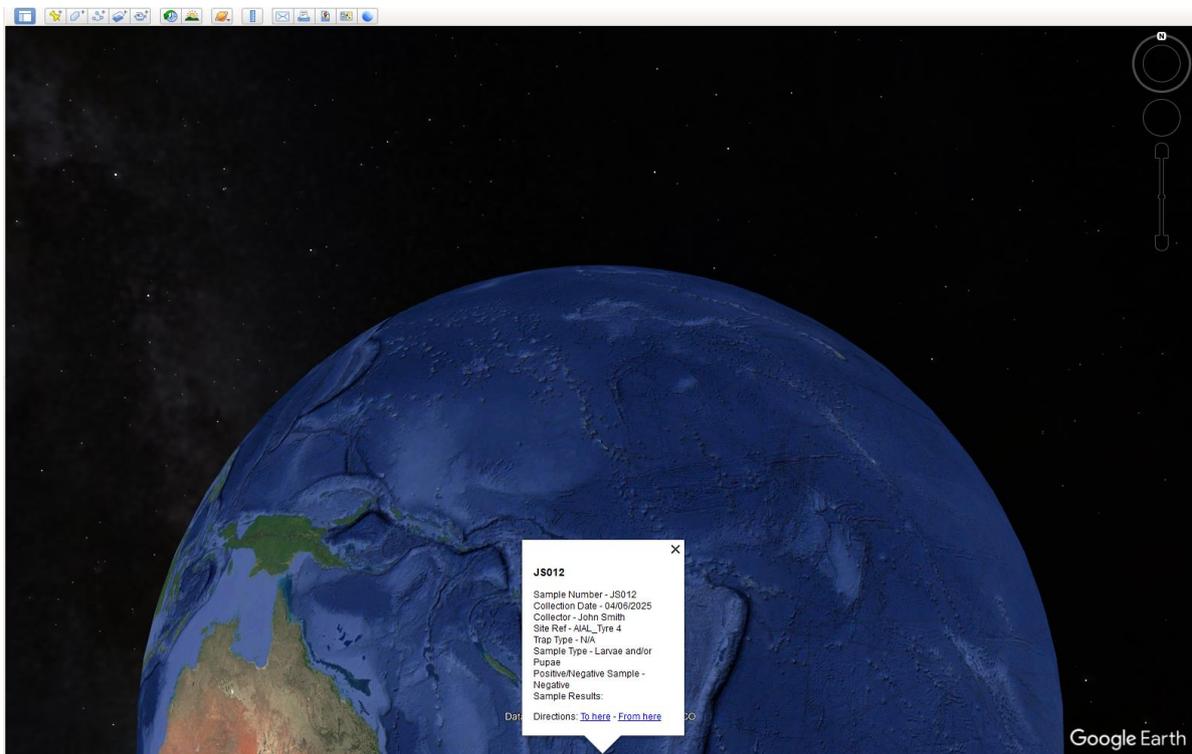


Figure 10: Coordinates in a sample have been entered incorrectly making the average point of the samples above New Zealand (example is desktop program of Google Earth)

When using the desktop version of Google Earth, despite there being the information of a sample displayed when the sample data is open, this is not necessarily the sample that is incorrect, rather it is the last sample that was entered in the database. The browser version of Google Earth does not have a pop up of sample information on opening the samples, however it will still show an average point of the samples.

To figure out which sample is incorrect, you can either look on the map and find where the pin is or find the sample in the list along the left side of the screen (Figure 11) and double click on each sample. This will take you to each of the samples in the map.

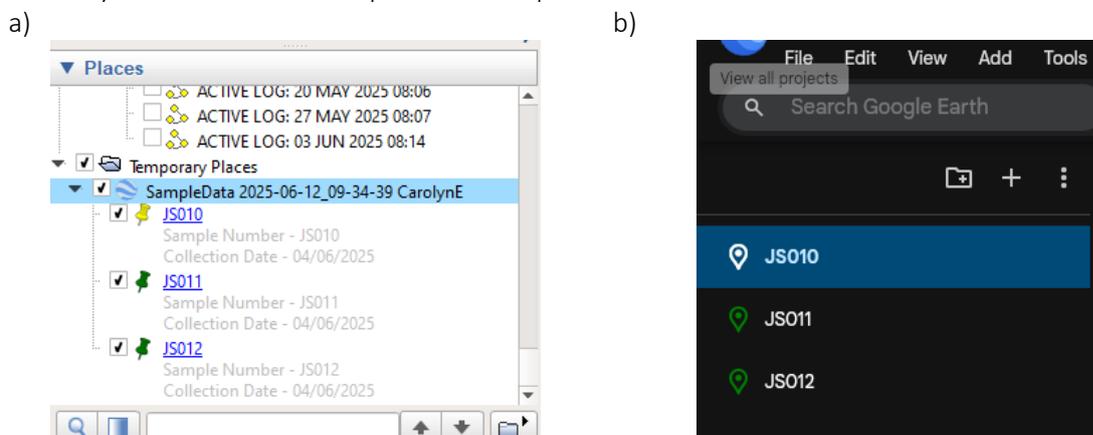


Figure 11: a) the list of samples on Google Earth Pro (desktop); b) the list of samples on the browser version of Google Earth

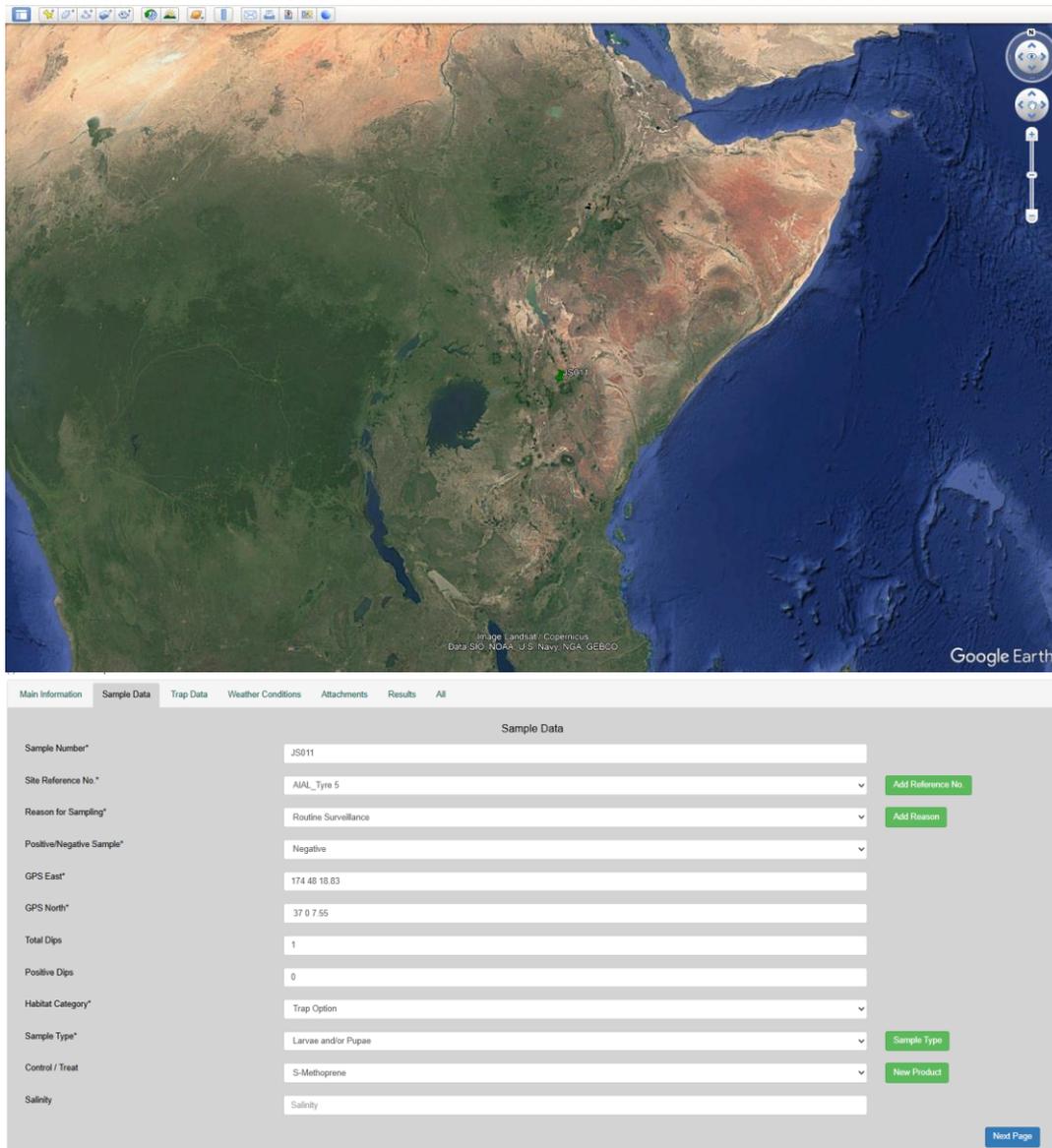
Fixing Samples which have GPS Coordinates Incorrectly Entered

Fixing samples where the GPS coordinates are incorrect will depend on what has been entered incorrectly.

Missing the “E” and “S”

One of the most common ways that coordinates are entered incorrectly is missing the “E” and “S” at the end of the coordinates in their respective boxes in the database. When this occurs, the points will export and be assumed to be “W” and “N” rather than “E” and “S”. The result is pin displaying in the wrong area of the globe which will vary with what part is missing (Figure 12).

Going to the incorrect sample and adding the appropriate missing letter to the coordinates will resolve this problem. Ensure that the site reference in “List Site References” is also correct.



The image shows a Google Earth interface with a satellite view of Africa. A green pin labeled 'JS011' is located in the central part of the continent. Below the map is a data entry form titled 'Sample Data'. The form contains the following fields and values:

Field	Value
Sample Number*	JS011
Site Reference No.*	AIMA_Type 5
Reason for Sampling*	Routine Surveillance
Positive/Negative Sample*	Negative
GPS East*	174 48 18.83
GPS North*	37 0 7.55
Total Dips	1
Positive Dips	0
Habitat Category*	Trap Option
Sample Type*	Larvae and/or Pupae
Control / Treat	S-Methoprene
Salinity	Salinity

Figure 12: Sample JS011 is missing the “E” and “S” from the coordinates, and as a result is displaying in Africa

The symbols ° “ ‘ have not been removed

Not removing the symbols that are displayed in the coordinates (° “ ‘ and sometimes - instead of an “S”) will result in the pin mapping in the South Atlantic Ocean (Figure 13). This is because the database is unable to read the points correctly and defaults to placing the pin at the coordinates 0° 0'0.00"N, 0° 0'0.00"E (Figure 14).

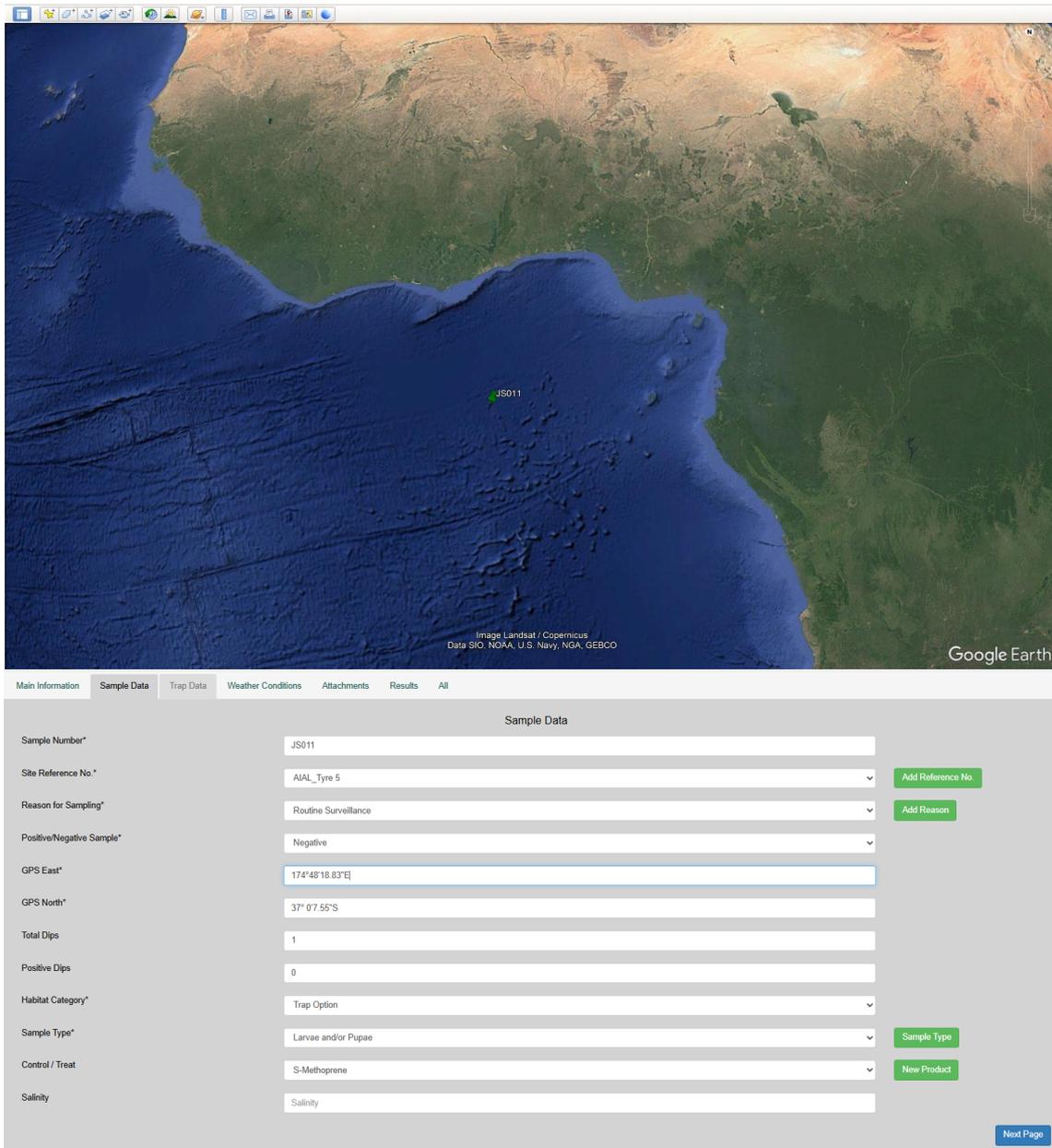


Figure 13: The ° “ ‘ symbols have not been removed from the coordinates and replaced with a space

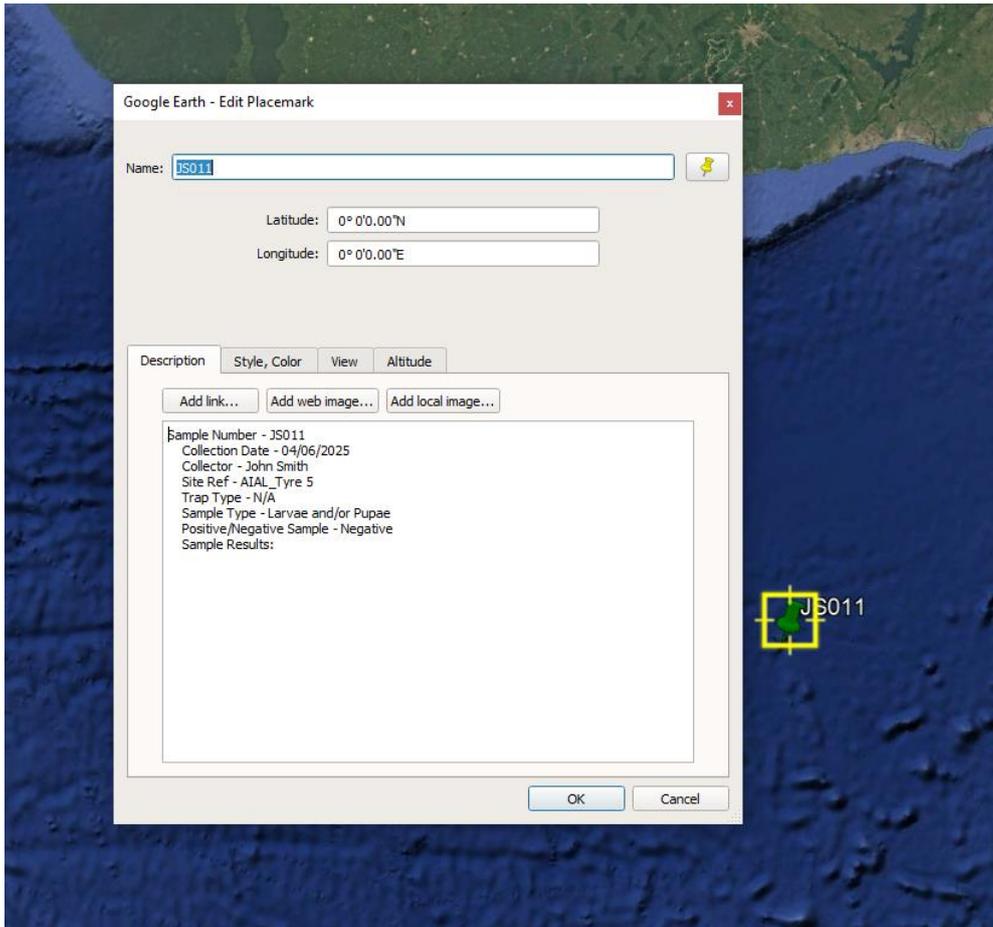


Figure 14: The database cannot read the symbols and has defaulted to putting the pin at placing the pin at 0° 0'0.00"N, 0° 0'0.00"E

Going to the incorrect sample and replacing the ° “ ‘ symbols in the coordinates with a space will resolve this problem. If there is a - in the coordinates to denote the southern hemisphere, remove this and ensure there is an “S” at the end. Ensure that the site reference in “List Site References” is also correct.

The “GPS East” and “GPS South” have been entered in the wrong box

Another common error is that the “GPS East” and “GPS North” have been entered into the wrong boxes as the database is ordered opposite to standard. This will cause the pin to display in the North Pacific Ocean (Figure 15).

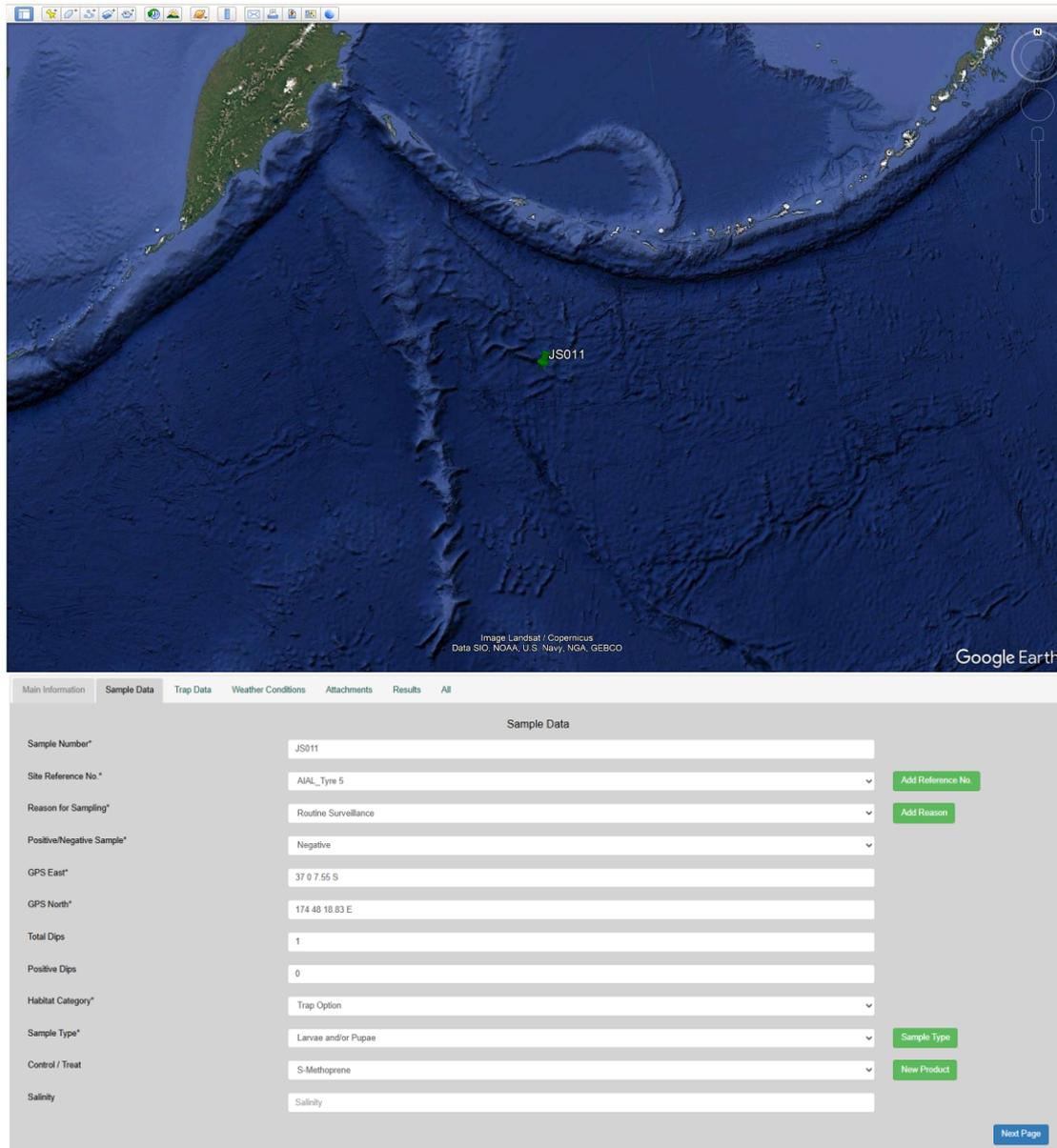


Figure 15: Pin displays in the Norther Pacific Ocean

Going to the sample and switching the coordinates to the correct box will resolve this issue. Ensure that the site reference in “List Site References” is also correct.

GPS Drift/Coordinates missing a number/Number in Coordinates entered wrong

When taking the coordinates, the GPS drift will be displayed on the GPS as +/- and a number, with the number being the accuracy of the coordinates to within this number of meters (e.g. +/-5m is accurate to within 5 meters of the correct site). The higher the value, the more imprecise the final point will be. Ideally coordinates should be recorded when this number is as low as possible. The amount of drift can be affected by things such as being inside a building, under tree canopy, or sometimes a very cloudy day.

When exporting a KML, coordinates that are incorrect due to GPS drift may look like the following (Figure 16). Typically, these will display near where the correct site is.

Correcting these is shown below in [Fixing Coordinates in Samples Using Google Earth](#) below.



Figure 16: Coordinates for JS010 are inaccurate and are displaying away from the correct site (red arrow)

If the coordinates are missing a number or have had a number in coordinates entered wrong, they will often display similarly to GPS, though the point may be a significant distance away (particularly if the number is wrong). This will generally be the sample being displayed further to the North or South, or the East or West depending on which part of the coordinates are wrong (Figure 17 a & b).

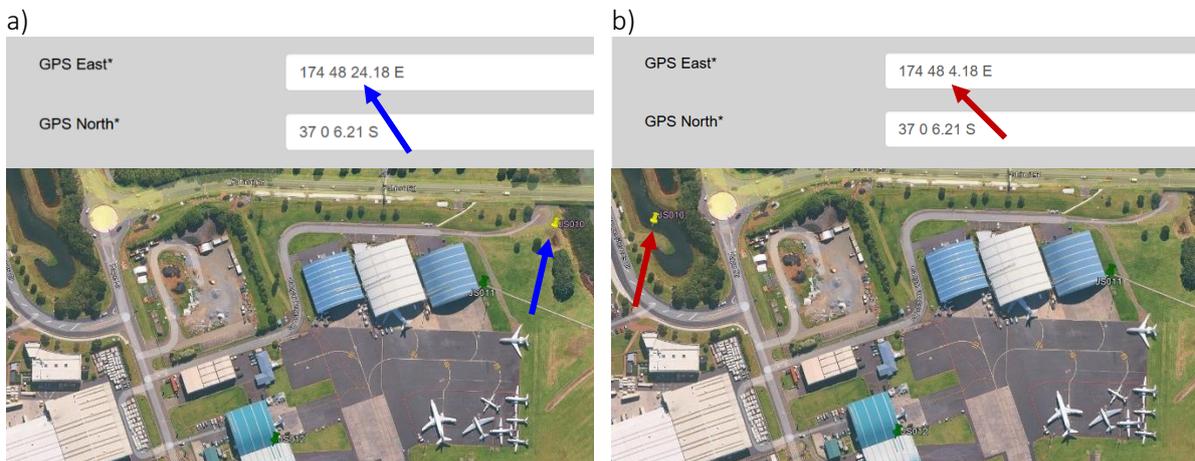


Figure 17: a) The correct coordinates for JS010; b) The coordinates for JS010 have had a number missed and are displaying in the wrong location as a result

The first point when correcting this is to go back to the original GPS coordinates, compare the two numbers and make sure they match. Make any required updates in both the sample and the site reference in “List Site References”. If the coordinates do match or are still mapping in the wrong location after they have been fixed, then use the steps in shown in [Fixing Coordinates in Samples Using Google Earth](#) below.

Fixing Coordinates in Samples Using Google Earth

Incorrectly displaying coordinates can be manually fixed using the exported data, which is often easier than retaking the coordinates, particularly if the error is due to GPS drift. This process is known as ground truthing and how it is done will depend on which version of Google Earth is being used.

Fixing Coordinates using Google Earth Pro

Fixing Coordinates using Google Earth is simple to do. Once you have located the sample that is in the incorrect location, right click on either the pin or the sample in the list on the left side of the screen. This will bring up a dialog box that shows the sample information, including the coordinates (Figure 18).

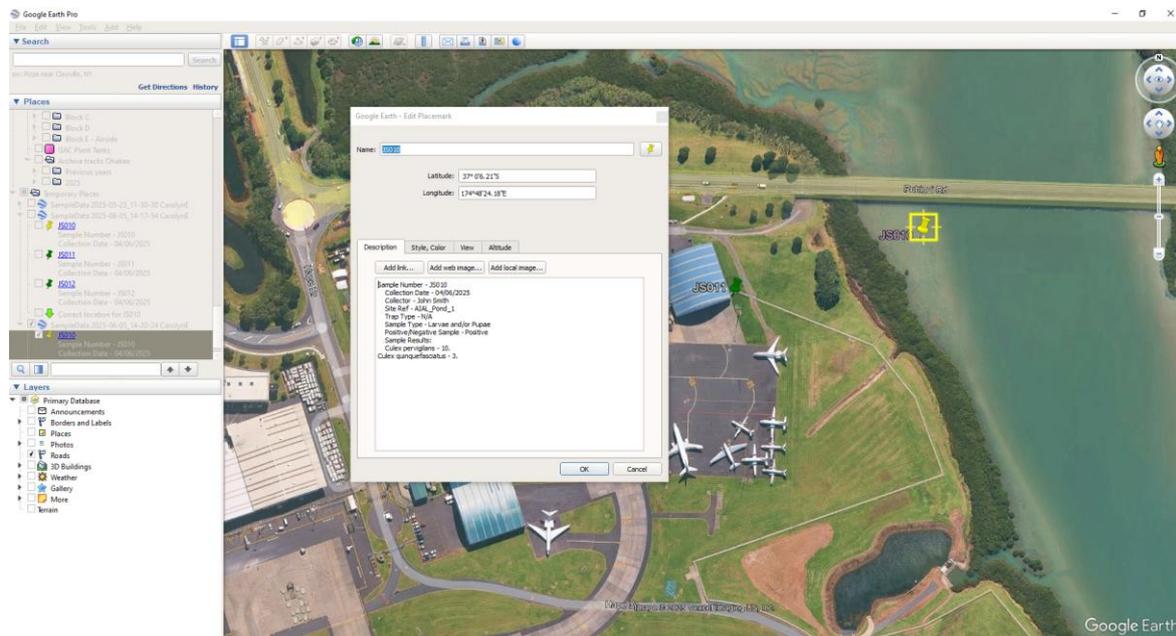


Figure 18: Dialog box with sample information including GPS coordinates

This will also allow you to move where the pin is located on the map by dragging it with the cursor. As you move the pin the GPS coordinates will update to the new location (Figure 19). Once you have moved the pin to the correct spot on the map, you can copy the coordinates from Google Earth Pro to the database (just be sure to replace the ° “ ’ symbols with a space). Ensure that these are updated in both the site reference and the sample.

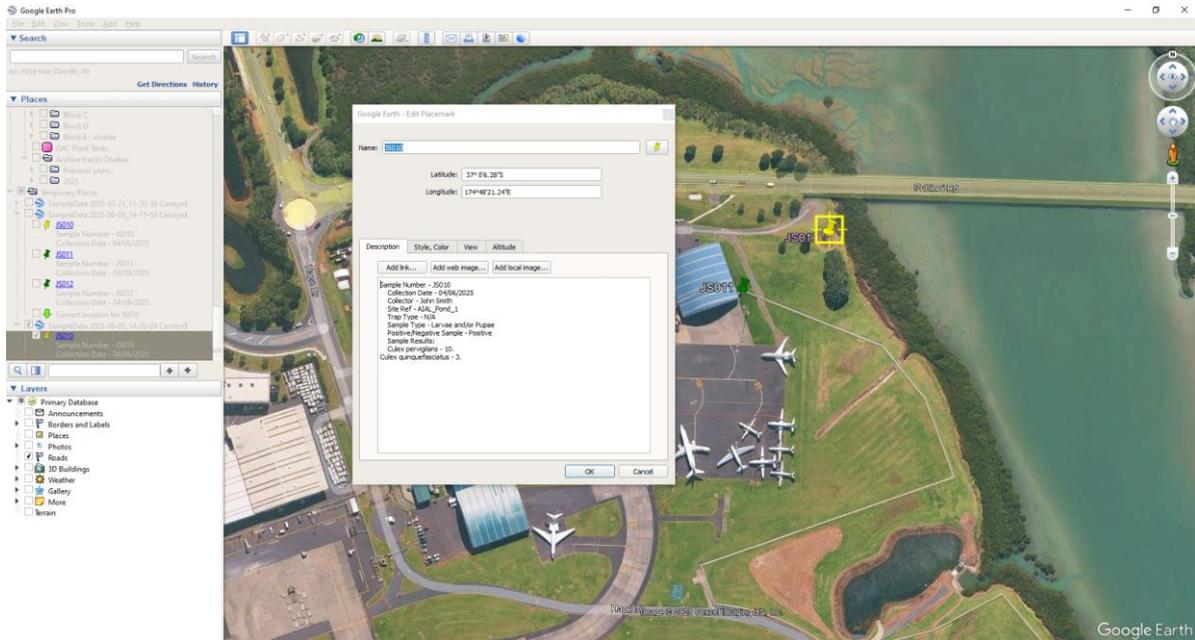


Figure 19: Dialog box with sample pin moved to the correct location

Fixing Coordinates using Google Earth in a browser

As with Google Earth Pro, fixing the coordinates in Google Earth is simple to do. Once the incorrect pin is located, click on the pin and select “Edit” at the bottom of the sample information (Figure 20).

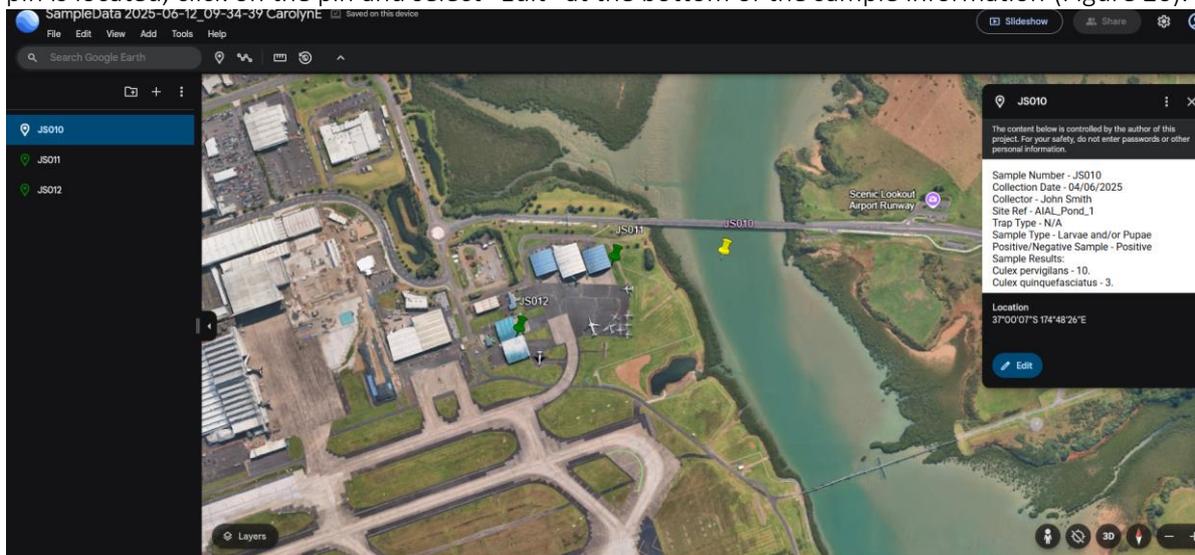


Figure 20: Dialog box with sample information including GPS coordinates and the option to edit

Once you have clicked “Edit” the box with the sample information will change and you will be able to pick the pin up and move it with your cursor (Figure 21). Once you have relocated the to the correct spot, click “View”. This will update back to the original box which has the updated GPS coordinates displayed on the bottom of the box (Figure 22). Clicking on the coordinates will copy them to the clipboard and allow you to transfer them to the database. As with using Google Earth Pro, be sure to replace the ° ‘ ‘ symbols with a space and ensure that these are updated in both the site reference and the sample.

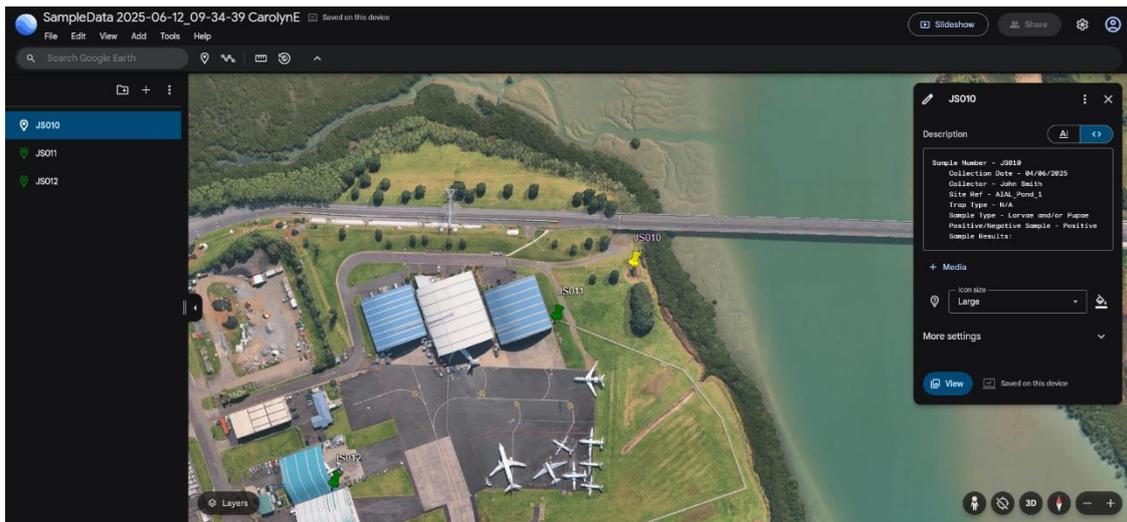


Figure 21: Dialog box with sample information will change and allow the pin to be moved on the map

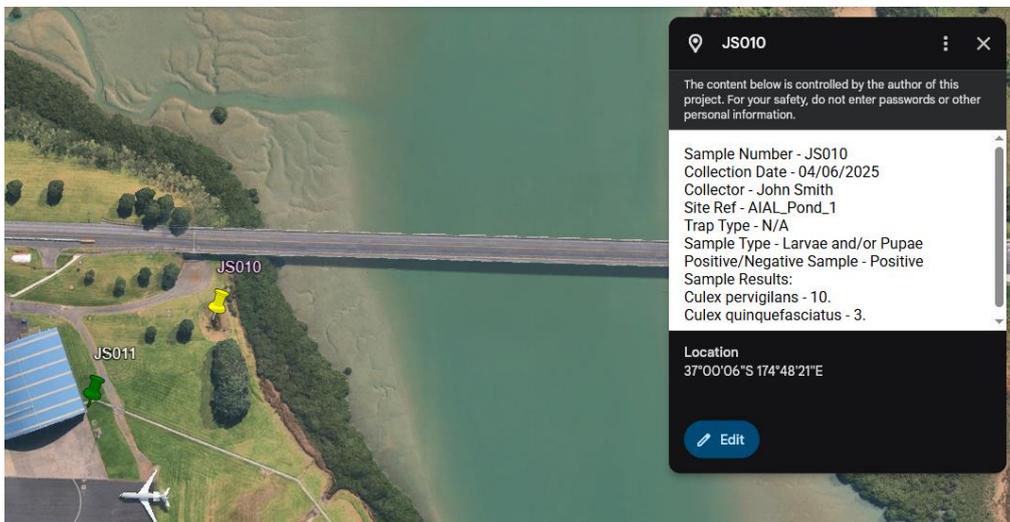


Figure 22: GPS coordinates have updated and are able to be copied into the database

Final Steps

Once you have updated the GPS coordinates, it is often useful to re-export them to ensure that all the updates were applied correctly and to check that the map is correct. If any of the pins are still displaying incorrectly, re-check the steps here and export the map again until you are satisfied with the placement of the pins.

If you have any questions or have found an issue that is not covered in this document, please contact the lab.