

PART 3: STEP-BY-STEP EXAMPLES

Examples

Feature – with Obvious Spatial Extent using GEOLocate

Feature – without Obvious Spatial Extent using Google Maps & MaNIS Georeferencing Calc.

Offset – Distance at a Heading using Google Maps & the MaNIS Georeferencing Calculator

Offset – Path using Google Maps and the MaNIS Georeferencing Calculator

Feature – with Obvious Spatial Extent

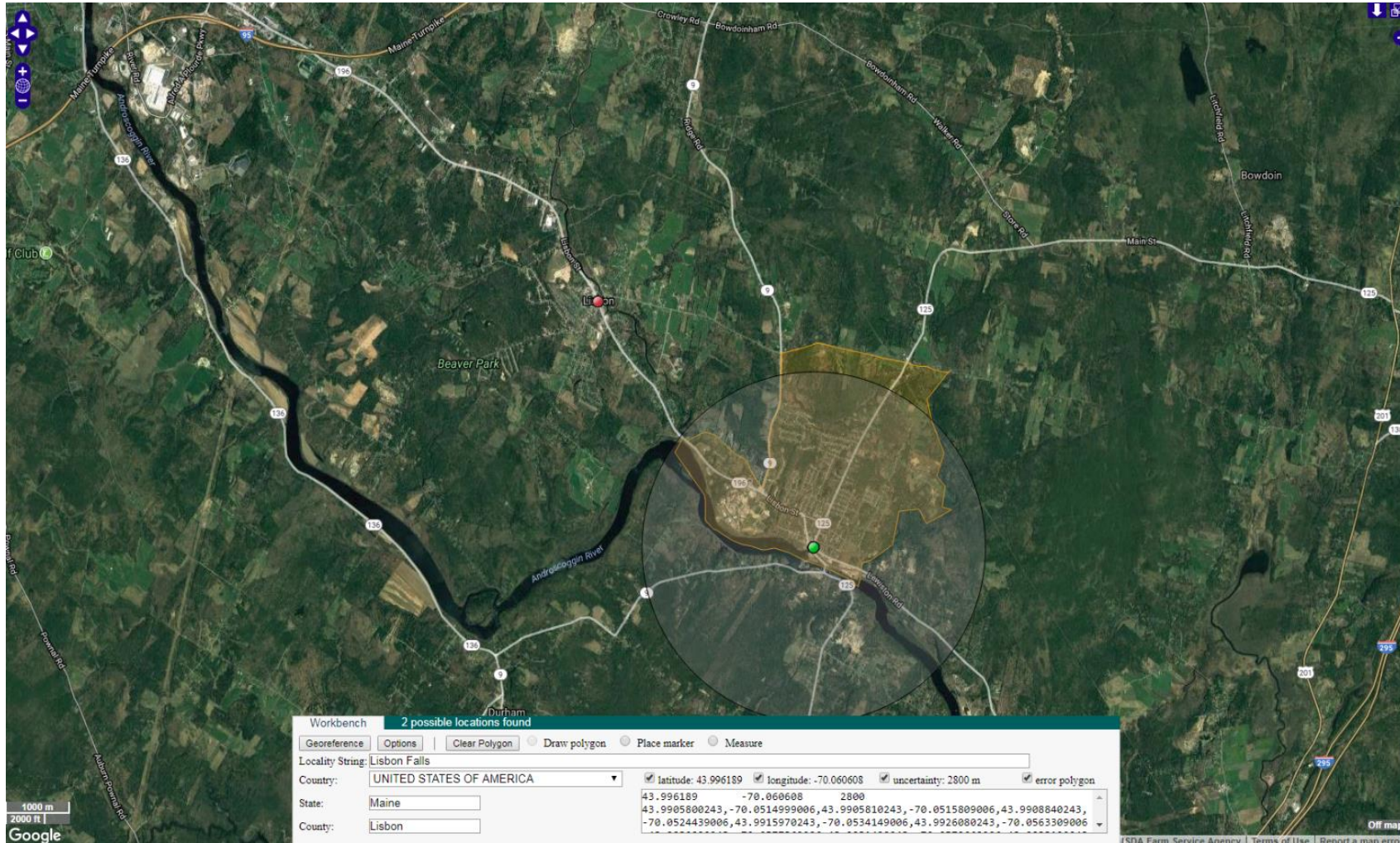
Example: *Lisbon Falls, Lisbon County, Maine (U.S.)*

Procedure:

- Use GEOLocate to find coordinates + radial for the city
- Ensure coordinates are at corrected center of the city
- Edit radial to encompass area as precisely as possible (snap to feature)

GEOLocate is best for simple localities: cities/towns, counties, offsets at a heading localities

GEOLocate

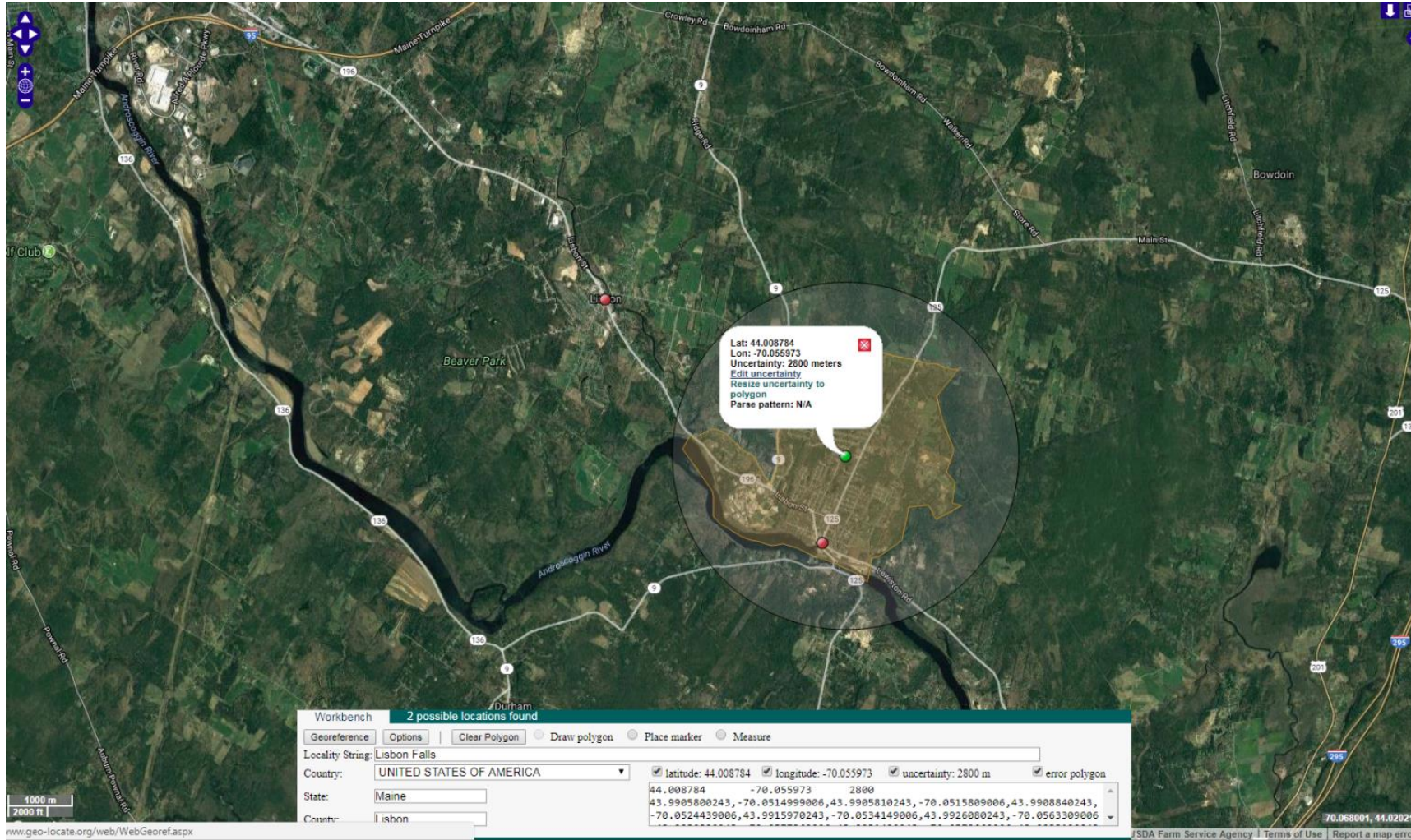


GEOLocate finds coordinates within Lisbon Falls

Coordinates need to be shifted slightly to center

Uncertainty radius does not encompass entire area of city

Adjust Coordinates



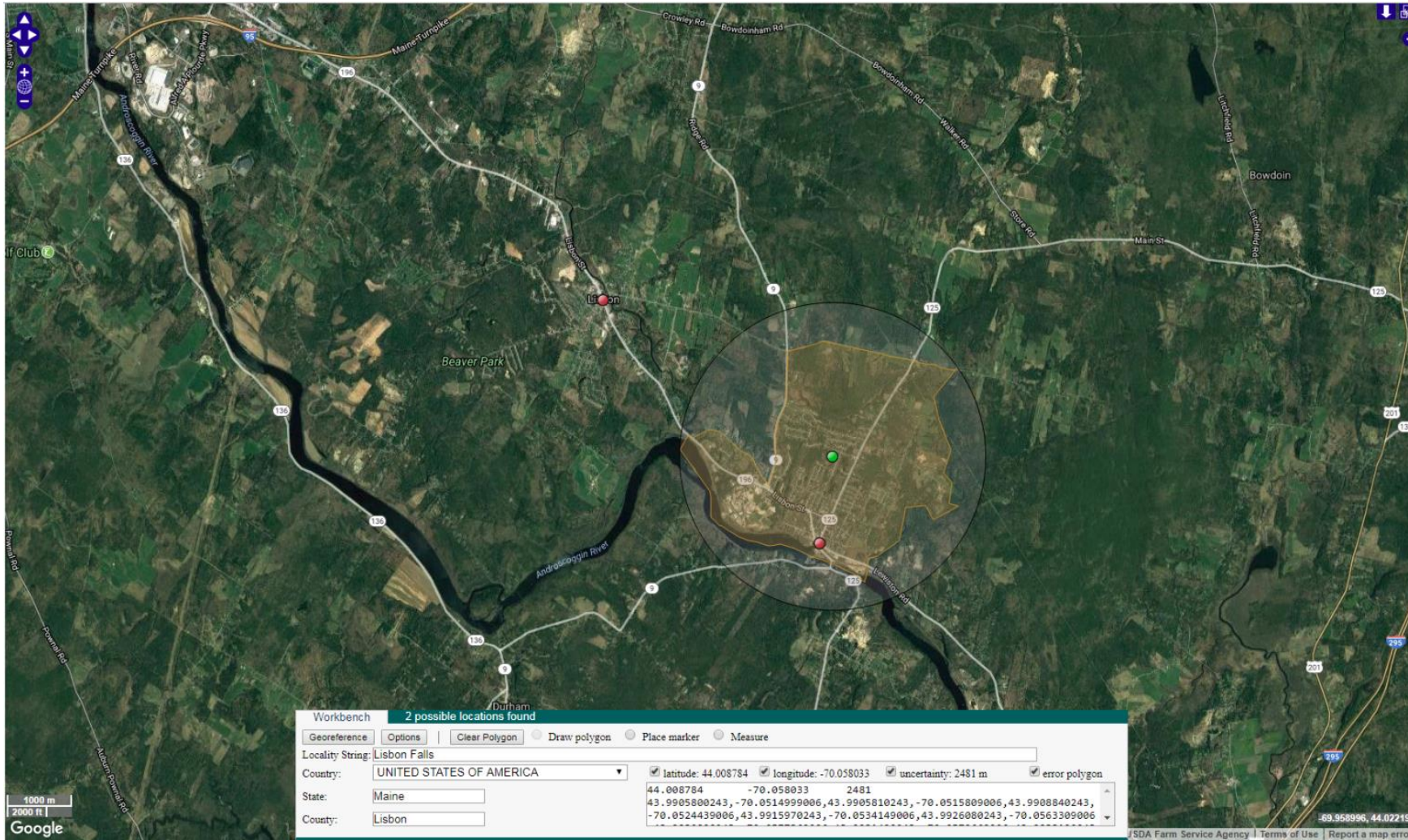
Adjust point to be in
approximate center of
region

Resize uncertainty to
polygon



**Automates the
georeference**

Edit Uncertainty



Uncertainty should encompass entire area of city (polygon)

Note: polygon of city extent is not always displayed/known

Feature – without Obvious Spatial Extent

Example: *Tabocal, Amazonas (Brazil)*

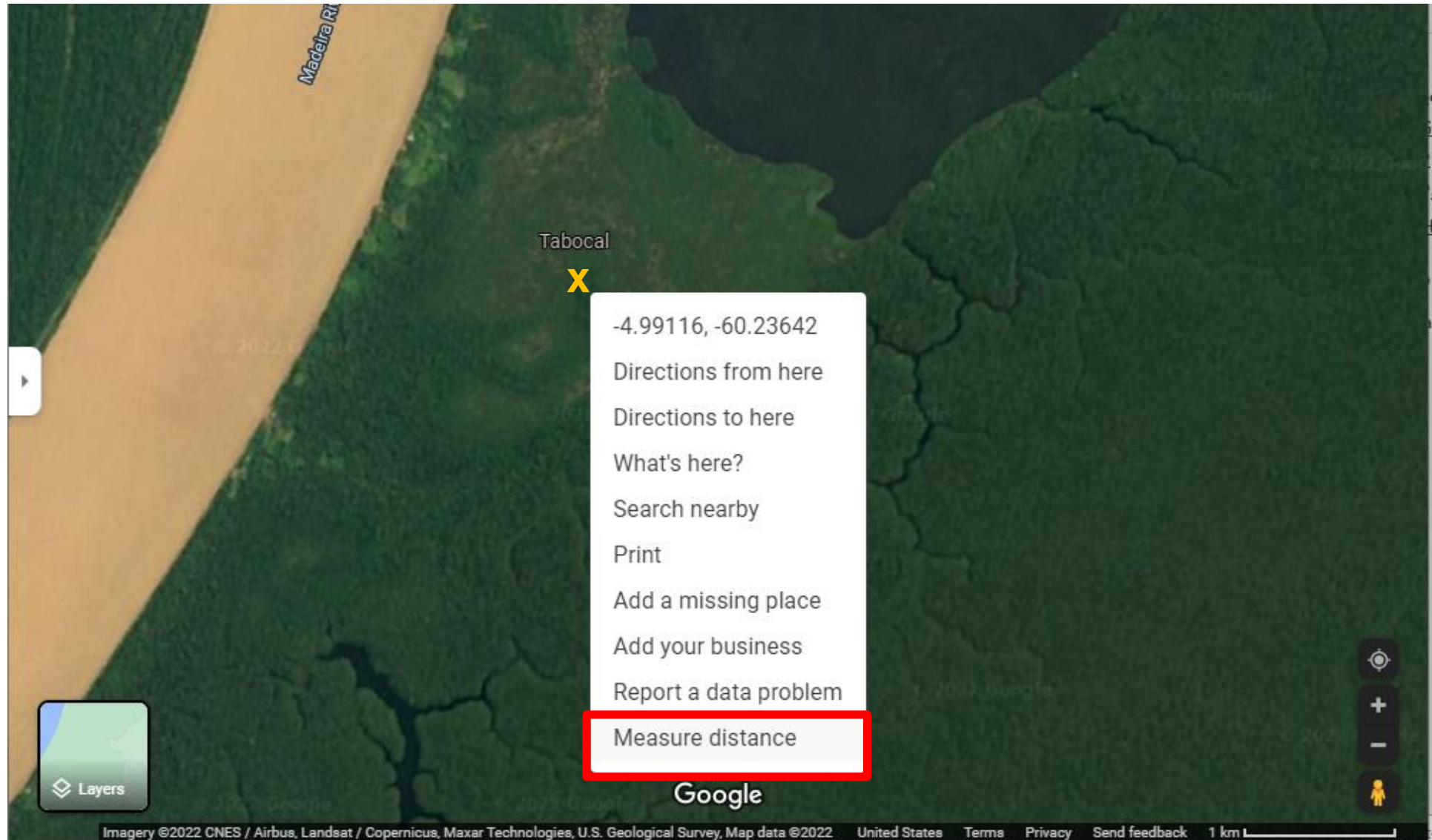
- Use Google Maps to locate coordinates of the region
- Measure from the coordinates to the approximate center of the nearest feature (of similar locality type)
- Divide distance in half to approximate the geographic radial
- Input information into the MaNIS Georef. Calculator to find the uncertainty radius

Without Obvious Spatial Extent



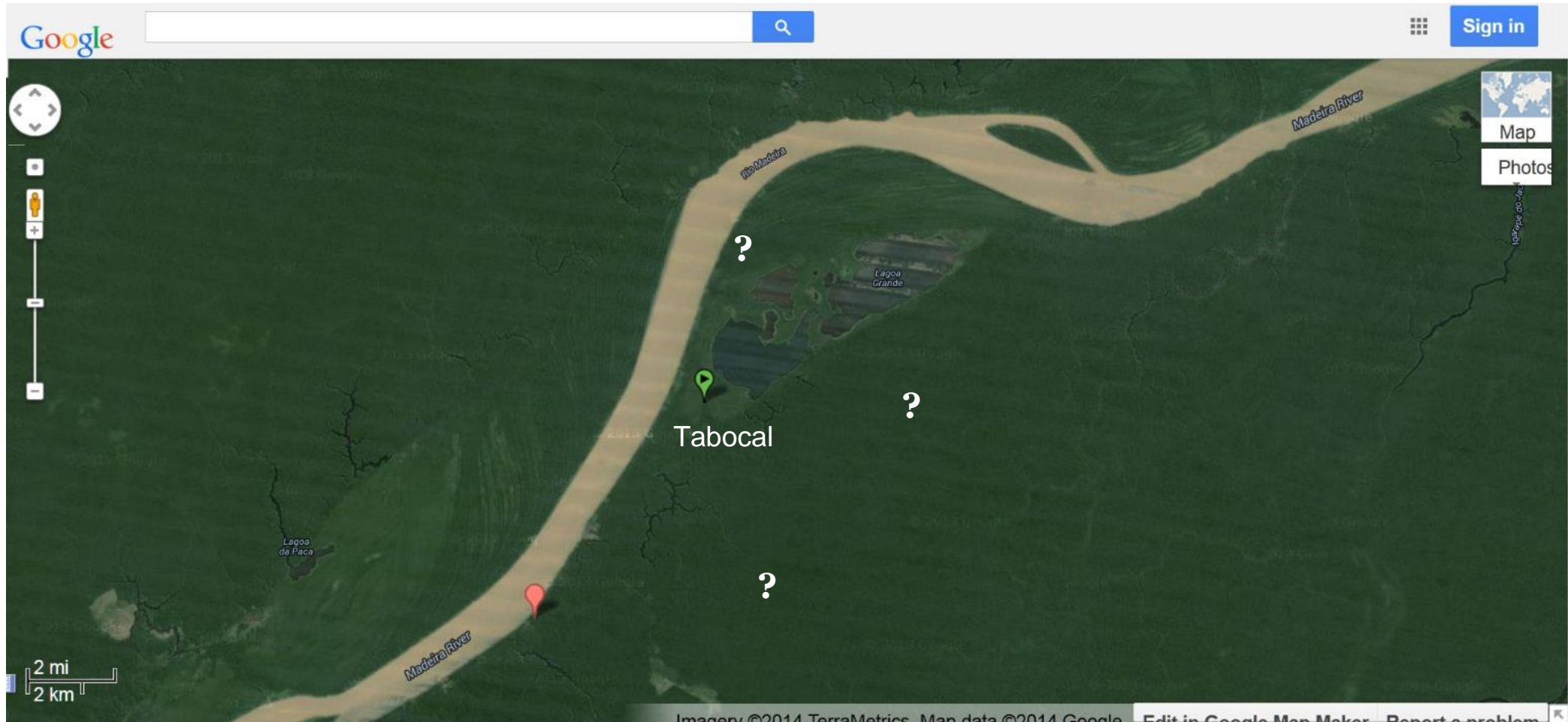
Immediately, we notice there are no discernable boundaries for this locality

Without Obvious Spatial Extent



Begin by starting the Measure distance tool by right clicking on the map next to where Google Maps places the name of the place

Without Obvious Spatial Extent



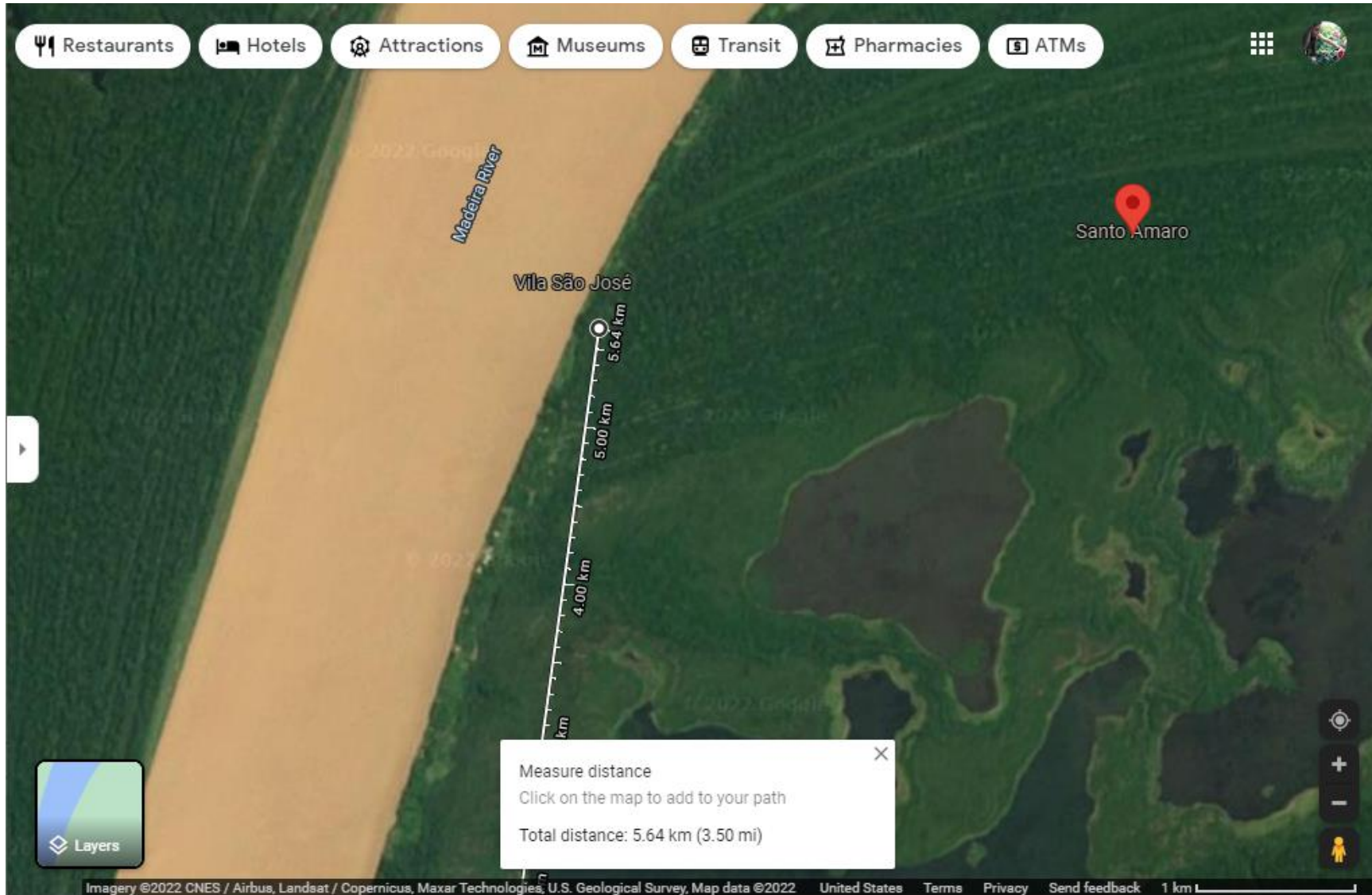
Nearest named place? Must pan around the map to locate.

Without Obvious Spatial Extent



North of Tabocal we see two named places (similar locality type), Vila São José and Santo Amaro.

Without Obvious Spatial Extent



Vila São José is nearer to Tabocal; measure a straight line between approximated centers of both features, then halve distance = radial.

Without Obvious Spatial Extent



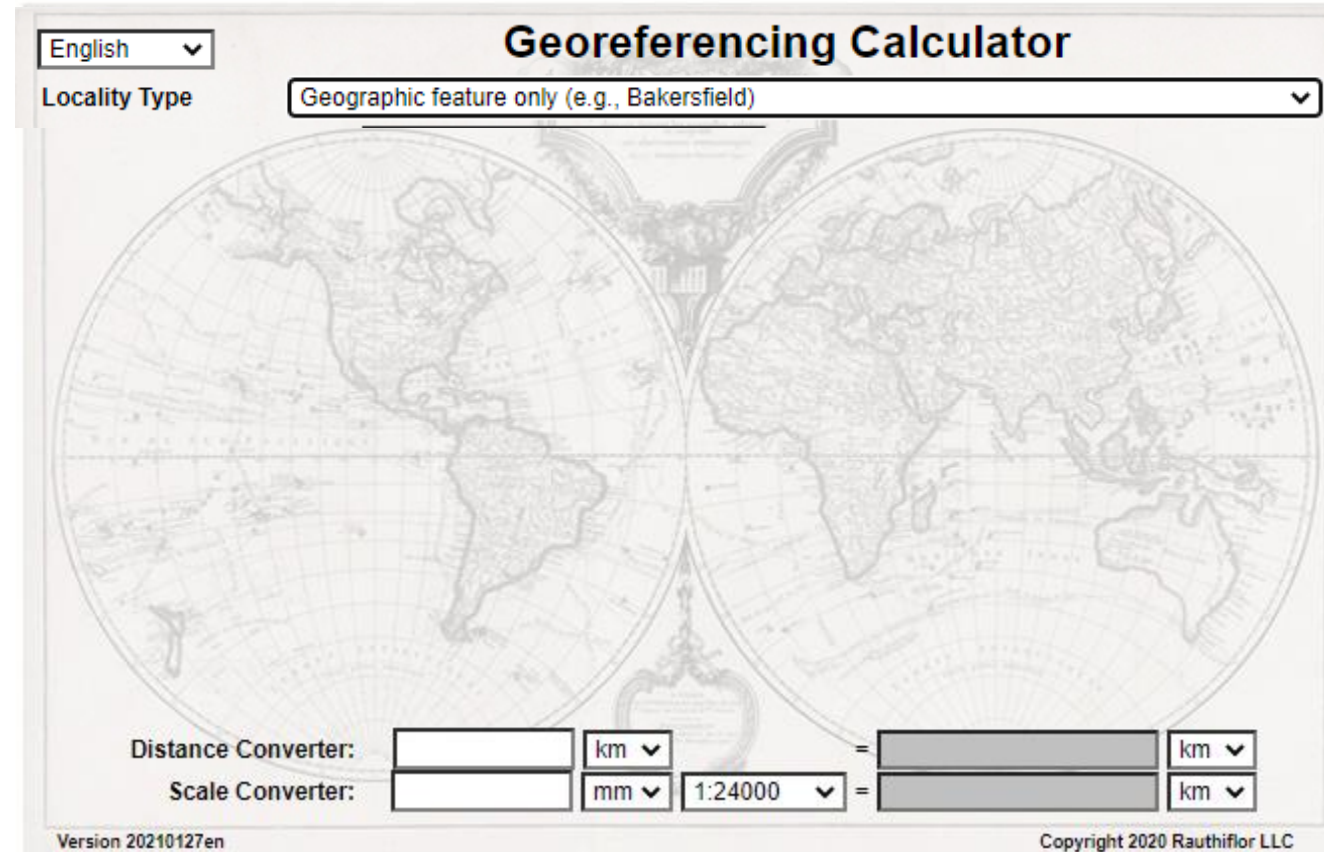
Radial: $5640 \text{ m} / 2 = 2820 \text{ m}$

Without Obvious Spatial Extent

LOCALITY TYPE	CALCULATION PROCEDURE (instructions on how to use the Georeferencing Calculator)
<p>Named place</p> <p>Undefined Area: Locality refers to a geographic feature that does not have a clear spatial boundary</p> <p><i>Example: "Pampa Grande" (the extent is 4.7 km given that the center of the nearest named place, "Colonia Mariano Saratea" is 9.4 km distant)</i></p>	<p>Calculation Type: "Error only - enter Lat/Long for the actual locality"</p> <p>Locality Type: "Named place only" ←</p> <p>Coordinates: Determine the coordinates for the named place as well as possible using visible evidence near the label for the named place on the map.</p> <p>Extent: Use half the measured distance from the selected coordinates to the center of the nearest named place. Make note of the measure and the nearest named place in <u>georeferenceRemarks</u>.</p>

MaNIS: Locality Type

Locality Type = Geographic feature only



[MaNIS Georeferencing Calculator](#)

Undefined Area: Tabocal, Município Borba, Amazonas (Brazil)

MaNIS: Locality Type

LOCALITY TYPE	CALCULATION PROCEDURE (instructions on how to use the Georeferencing Calculator)
<p>Named place</p> <p>Undefined Area: Locality refers to a geographic feature that does not have a clear spatial boundary</p> <p><i>Example: "Pampa Grande" (the extent is 4.7 km given that the center of the nearest named place, "Colonia Mariano Sarratea" is 9.4 km distant)</i></p>	<p>Calculation Type: "Error only - enter Lat/Long for the actual locality"</p> <p>Locality Type: "Named place only"</p> <p>Coordinates: Determine the coordinates for the named place as well as possible using visible evidence near the label for the named place on the map.</p> <p>Extent: Use half the measured distance from the selected coordinates to the center of the nearest named place. Make note of the measure and the nearest named place in <u>georeferenceRemarks</u>.</p>



MaNIS: Coordinate Source, Format, Datum, Precision

Coordinate Source: **Google Maps > 2008**

The basis of how the coordinates were located.

Coordinate Format: Based on coordinate source (Google Maps) = **decimal degrees**

Datum: **WGS84** (Google Maps)

Precision (of the coordinates): **exact** (Google Maps)

The screenshot shows the 'Georeferencing Calculator' web application. The interface includes a language dropdown set to 'English', a 'Locality Type' dropdown set to 'Geographic feature only (e.g., Bakersfield)', a 'Coordinate Source' dropdown set to 'Google Earth/Maps >2008', and a 'Coordinate Format' dropdown set to 'decimal degrees'. There are input fields for 'Input Latitude' and 'Input Longitude', and dropdowns for 'Datum' (set to '(WGS84) World Geodetic System 1984') and 'Precision' (set to 'exact'). On the right side, there are input fields for 'Radial of Feature', 'Measurement Error', and a 'Distance Units' dropdown set to 'km'. At the bottom of the input section are 'Calculate', 'Copy', and 'Go here' buttons. Below these is a table with columns: Latitude, Longitude, Uncertainty (m), Datum, Precision, Date, Georeferenced by, and Protocol. The 'Protocol' dropdown is set to 'protocol not recorded'. At the bottom, there are 'Distance Converter' and 'Scale Converter' sections, each with input fields and unit dropdowns. The footer contains 'Version 20210127en' and 'Copyright 2020 Rauthiflor LLC'.

Undefined Area: Tabocal, Município Borba, Amazonas (Brazil)

MaNIS: Coordinates

Latitude & Longitude: Do ***NOT*** need to be entered

The screenshot shows the 'Georeferencing Calculator' web application. It features a background map of the United States. The interface includes several input fields and dropdown menus for configuring georeferencing parameters. At the top left, there is a language dropdown set to 'English'. The 'Locality Type' is set to 'Geographic feature only (e.g., Bakersfield)'. The 'Coordinate Source' is 'Google Earth/Maps >2008', and the 'Coordinate Format' is 'decimal degrees'. The 'Datum' is '(WGS84) World Geodetic System 1984', and the 'Precision' is 'exact'. On the right side, there are fields for 'Radial of Feature', 'Measurement Error', and 'Distance Units' (set to 'km'). Below these are three buttons: 'Calculate', 'Copy', and 'Go here'. A table below the buttons has columns for 'Latitude', 'Longitude', 'Uncertainty (m)', and 'Datum', with the first two cells currently empty. Another table below that has columns for 'Precision', 'Date', 'Georeferenced by', and 'Protocol', with the 'Protocol' cell containing 'protocol not recorded'. At the bottom, there are two conversion sections: 'Distance Converter' and 'Scale Converter', each with input fields and unit dropdowns. The footer contains 'Version 20210127en' and 'Copyright 2020 Rauthiflor LLC'.

Latitude	Longitude	Uncertainty (m)	Datum

Precision	Date	Georeferenced by	Protocol
			protocol not recorded

Distance Converter: [] km = [] km
Scale Converter: [] mm 1:24000 = [] km

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Undefined Area: Tabocal, Município Borba, Amazonas (Brazil)

MaNIS: Radial of Feature

Radial of Feature: Enter approximate **radial** of Tabocal.

- The halved linear distance from the estimated centers of Tabocal and nearest named place, Vila São José

Measurement Error: **10 m** (standard)

= *Error associated with the **georeferencer's ability to measure on the map***

Distance Unit: m (must reflect the two fields above)

The screenshot shows the 'Georeferencing Calculator' interface. It includes a language dropdown set to 'English', a 'Locality Type' dropdown set to 'Geographic feature only (e.g., Bakersfield)', a 'Coordinate Source' dropdown set to 'Google Earth/Maps >2008', and a 'Coordinate Format' dropdown set to 'decimal degrees'. Input fields for 'Input Latitude' and 'Input Longitude' both contain '0'. The 'Datum' is set to '(WGS84) World Geodetic System 1984' and 'Precision' is set to 'exact'. On the right side, 'Radial of Feature' is set to 2820, 'Measurement Error' is set to 10, and 'Distance Units' is set to 'm'. Below these are 'Calculate', 'Copy', and 'Go here' buttons. A table below the buttons has columns for 'Latitude', 'Longitude', 'Uncertainty (m)', and 'Datum'. The 'Date' field contains '2022-01-27T00:06:'. The 'Georeferenced by' field is empty, and the 'Protocol' dropdown is set to 'protocol not recorded'. At the bottom, there are 'Distance Converter' and 'Scale Converter' sections with input fields and dropdown menus for units (km, mm) and scale (1:24000). The footer shows 'Version 20210127en' and 'Copyright 2020 Rauthiflor LLC'.

Undefined Area: Tabocal, Município Borba, Amazonas (Brazil)

MaNIS: Calculate

CALCULATE !

Georeferencing Calculator

English

Locality Type: Geographic feature only (e.g., Bakersfield)

Coordinate Source: Google Earth/Maps >2008

Coordinate Format: decimal degrees

Input Latitude: 0

Input Longitude: 0

Datum: (WGS84) World Geodetic System 1984

Precision: exact

Radial of Feature: 2820

Measurement Error: 10

Distance Units: m

Calculate Copy Go here

Latitude	Longitude	Uncertainty (m)	Datum
0	0	2838	(WGS84) World Geodetic System 1984

Precision	Date	Georeferenced by	Protocol
0.0000001	2022-01-27T00:06:10		protocol not recorded

Distance Converter: [] km = [] km

Scale Converter: [] mm 1:24000 = [] km

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Undefined Area: Tabocal, Município Borba, Amazonas (Brazil)

MaNIS: Calculate

Uncertainty is provided in meters

The screenshot shows the 'Georeferencing Calculator' interface. The background features a faint world map. The interface includes several input fields and dropdown menus for configuring the calculation. The results are displayed in a table below the input fields.

Latitude	Longitude	Uncertainty (m)	Datum
0	0	2838	(WGS84) World Geodetic System 1984

Precision	Date	Georeferenced by	Protocol
0.0000001	2022-01-27T00:06:		protocol not recorded

Additional fields at the bottom include 'Distance Converter' and 'Scale Converter', both currently set to 'km' and 'mm' respectively, with a scale of '1:24000'.

Undefined Area: Tabocal, Município Borba, Amazonas (Brazil)

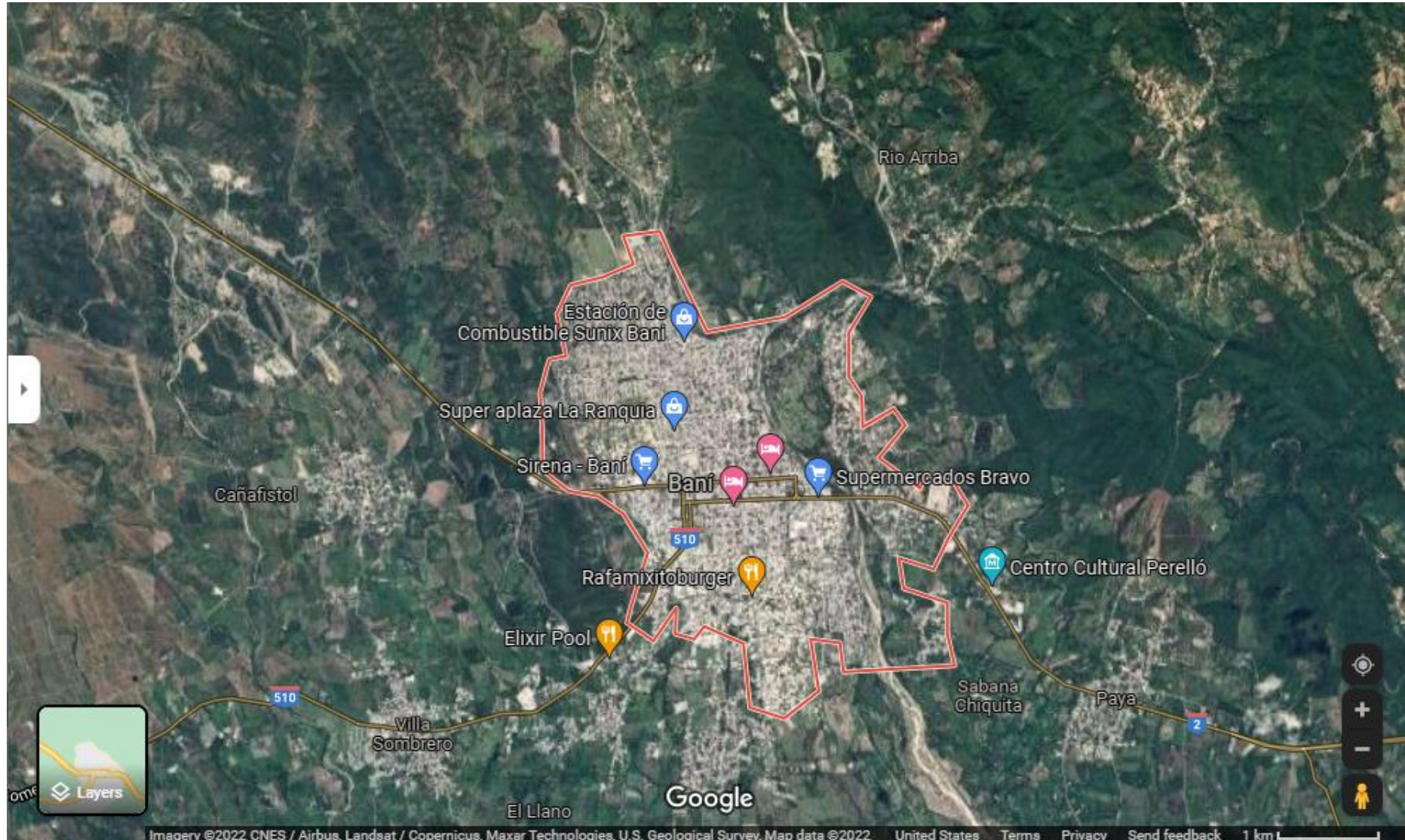
Offset – Distance at a Heading

Example: *5 km north of Baní, Dominican Republic*

- Use Google Maps to locate coordinates of the city
- Find radial by measuring from coordinates to the farthest extent of the city
- Input information into the MaNIS Georeferencing Calculator to find the offset coordinates and the uncertainty radius.

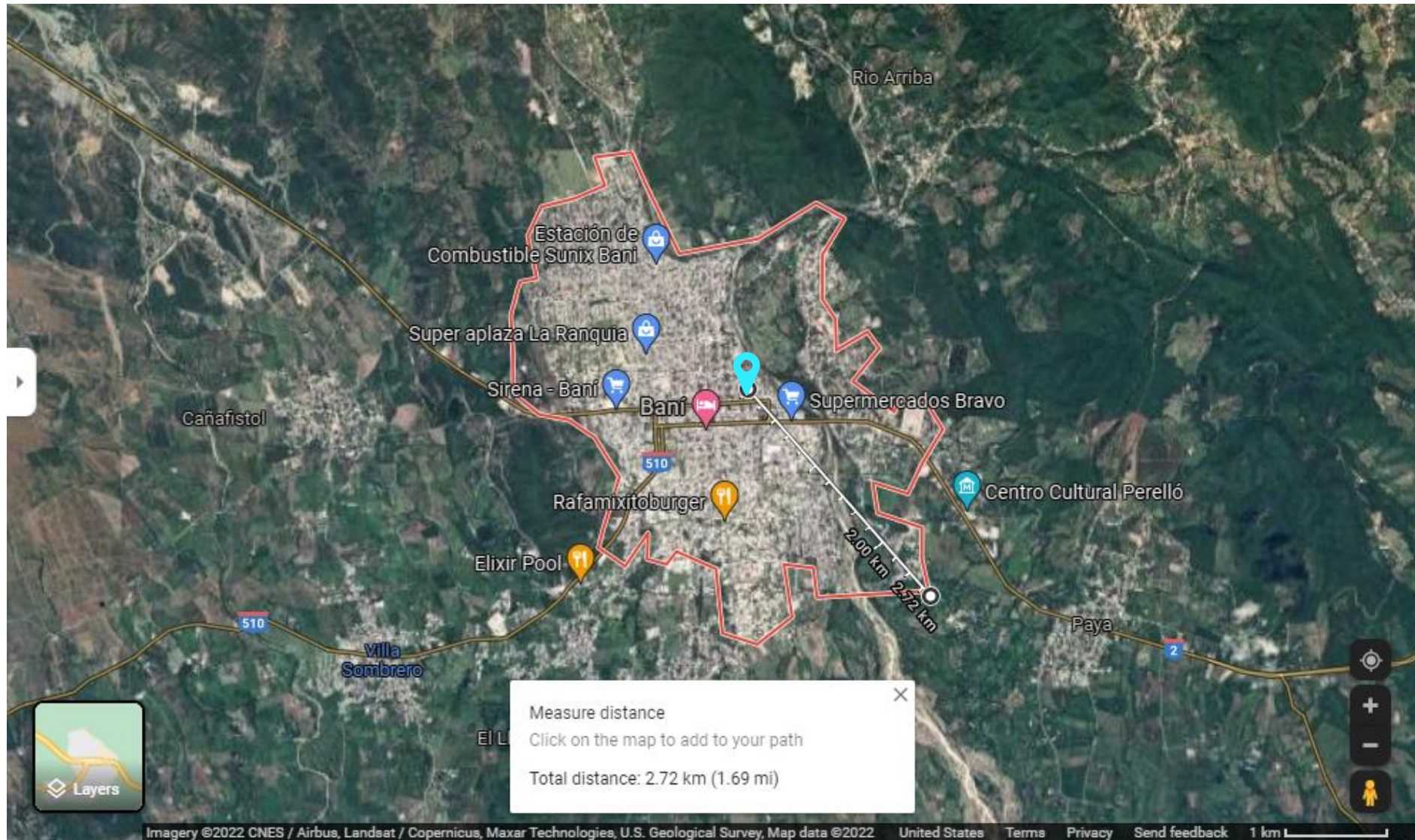
Note: Use GEOLocate when applicable (U.S., Canada, Europe)

Offset at a Heading



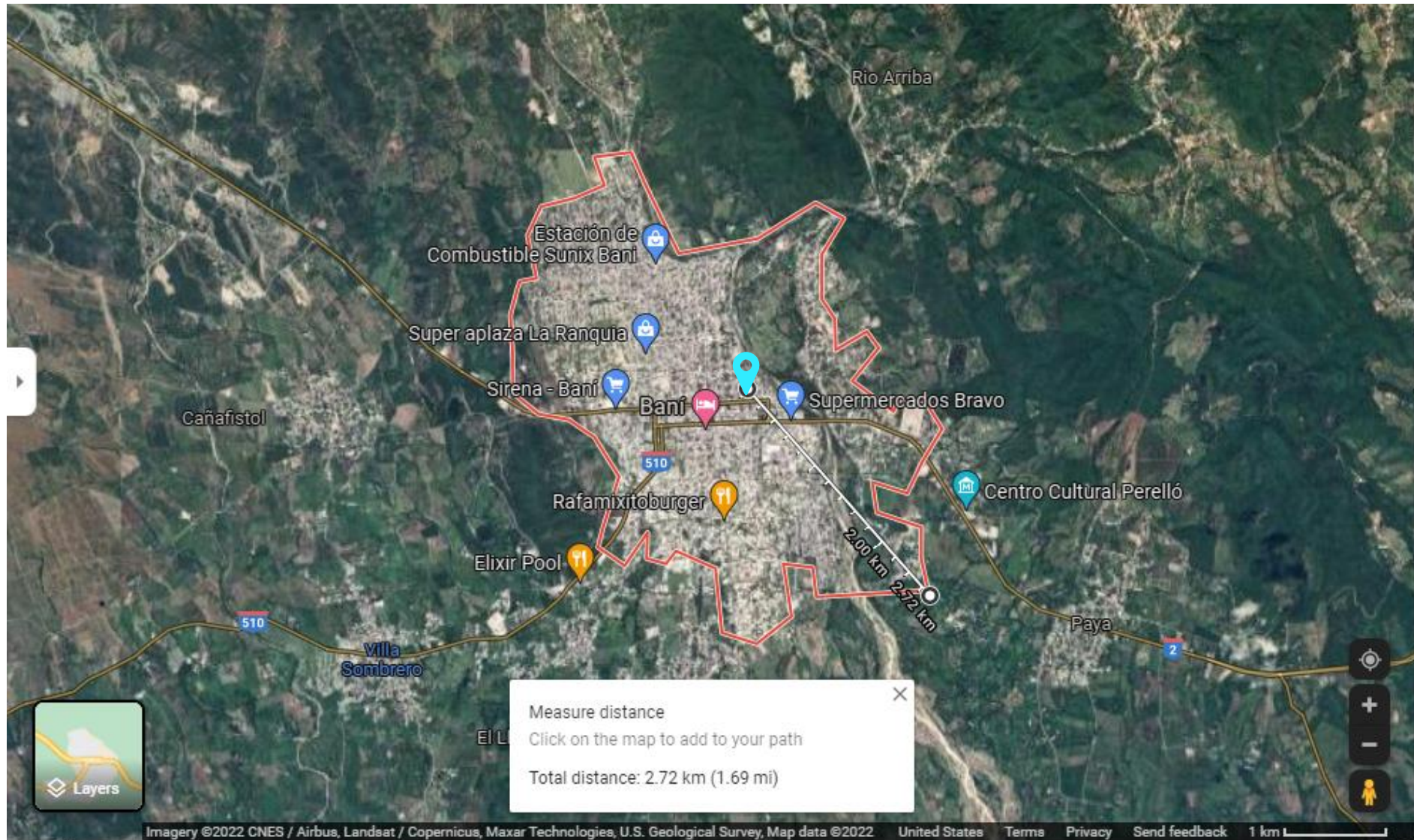
Locate city of Bani

Offset at a Heading



Locate coordinates for center of Bani (18.282227044, -70.32871990) and radial (2.72 km – matching units of offset)

Offset at a Heading



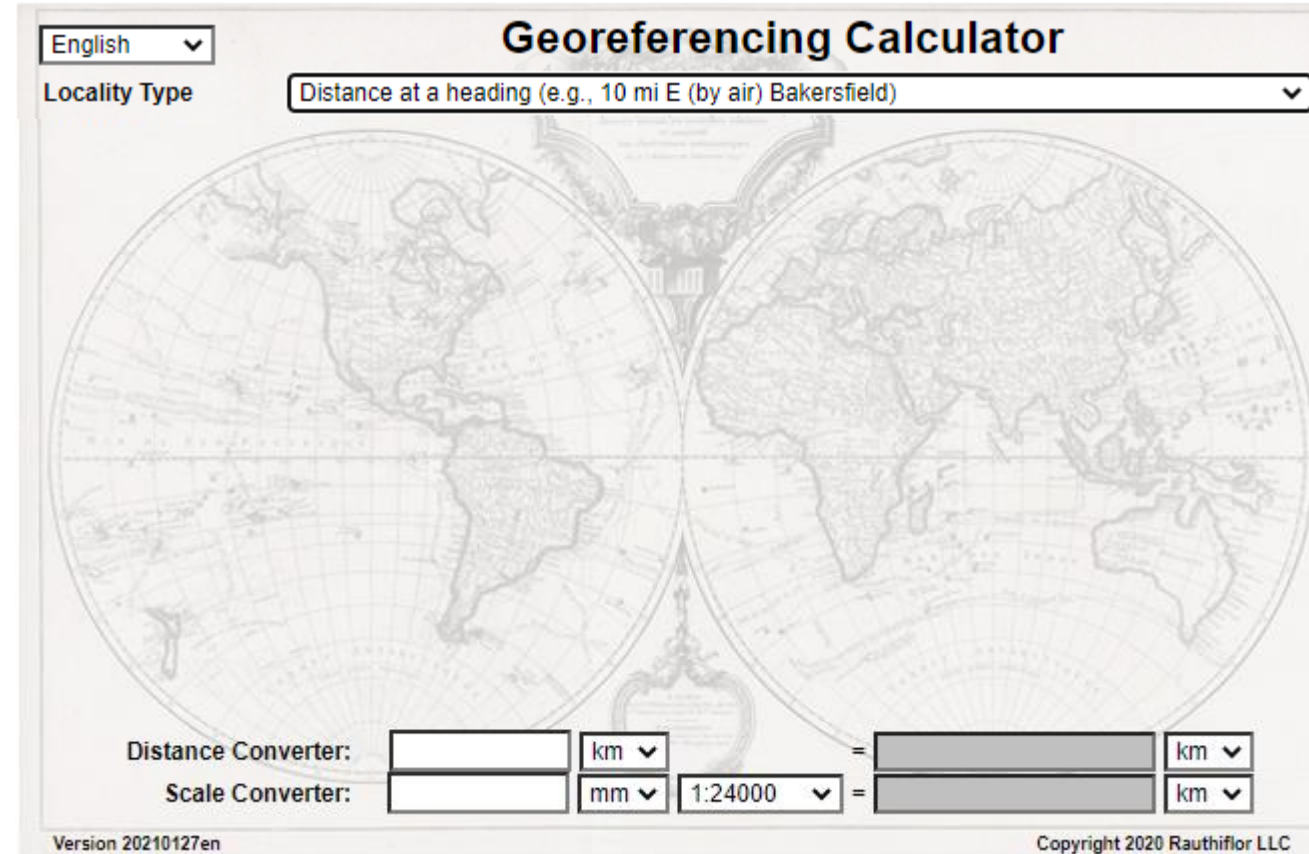
Notice that there is not one distinct road leading north from the city. Because of this, we can safely assume offset by air.

Offset at a Heading

LOCALITY TYPE	CALCULATION PROCEDURE (instructions on how to use the Georeferencing Calculator)
<p>Offset</p> <p>Offset at a heading</p> <p><i>Examples: "50 miles W of Las Vegas", "10 km E de Amamá"</i></p>	<p>Calculation Type: "Coordinates and error - enter the Lat/Long for the named place or starting point"</p> <p>Locality Type: <u>"Distance at a heading"</u> ← New input!</p> <p>Coordinates: If "by road" or other path is specified in the locality description, use the method under Offset Along a Path. If the description could be interpreted reasonably either by a route or by air, use the method under More Than One Possibility. Otherwise, assume that the heading is "by air" and note this assumption in georeferenceRemarks. In this case use the coordinates of the geographic center of the named place as a starting point in the Georeferencing Calculator. These are not the coordinates of the locality, which will be given in the fields to the left of the Calculate button when it is clicked after all the fields above it have been entered.</p> <p>Extent: As for Named Places – Bounded Area or Named Places – Undefined Area, as appropriate.</p>

MaNIS: Locality Type

Locality Type: Distance at a heading.



Offset at a Heading: 5 km N of Baní

MaNIS: Coordinate Source, Format, Datum, Precision

Coordinate Source: **Google Maps > 2008**

Coordinates must to be added to Offset at a Heading localities so the Calc. can find offset coordinates

Coordinate Format: Based on coordinate source (Google Maps) = **decimal degrees**

Datum: **WGS84** (Google Maps)

Precision (of the coordinates): **exact** (Google Maps)

English

Georeferencing Calculator

Locality Type: Distance at a heading (e.g., 10 mi E (by air) Bakersfield)

Coordinate Source: Google Earth/Maps >2008

Coordinate Format: decimal degrees

Input Latitude: 18.282227044

Input Longitude: -70.32871990

Datum: (WGS84) World Geodetic System 1984

Precision: exact

Direction: degrees from N

Offset Distance:

Radial of Feature:

Measurement Error:

Distance Units: km

Precision: 1 km

Calculate Copy Go here

Latitude	Longitude	Uncertainty (m)	Datum

Precision	Date	Georeferenced by	Protocol
	2022-01-27T00:06:		protocol not recorded

Distance Converter: [] km = [] km

Scale Converter: [] mm 1:24000 = [] km

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Offset at a Heading: 5 km N of Baní

MaNIS: Offset

Offset Direction: **N**

Offset Distance: **5 (km)** – according to locality description.

Radial of Feature: (Starting point of offset)
City of Baní = **2.72 (km)**

Measurement Error:
Always use **10 m (or 0.01 km*)**

Distance Precision:
precision of 5 km distance is **1 km!**

*Enter **all measurements** in the **same unit** as the offset distance to maintain consistency!

Distance	Precision
8 km →	1 km
8.5 km →	0.5 km
8.25 km →	0.25 km
8.75 km →	0.25 km
8.6 km →	0.1 km
8.0 km →	0.1 km
8.16 km →	0.01 km

80 km →	10 km
800 km →	100 km
1000 km →	500 km

English

Georeferencing Calculator

Locality Type: Distance at a heading (e.g., 10 mi E (by air) Bakersfield)

Coordinate Source: Google Earth/Maps >2008

Coordinate Format: decimal degrees

Input Latitude: 18.282227044

Input Longitude: -70.32871990

Datum: (WGS84) World Geodetic System 1984

Direction: N

Offset Distance: 5

Radial of Feature: 2.72

Measurement Error: .010

Distance Units: km

Precision: 1 km

Calculate Copy Go here

Longitude: Uncertainty (m): Datum:

Date: Georeferenced by: Protocol: protocol not recorded

km mm 1:24000 km

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Offset at a Heading: 5 km N of Baní

MaNIS: Calculate

Calculate!

Offset coordinates and uncertainty radius (in meters) are provided.

Georeferencing Calculator

English

Locality Type: Distance at a heading (e.g., 10 mi E (by air) Bakersfield)

Coordinate Source: Google Earth/Maps >2008 Direction: N

Coordinate Format: decimal degrees

Input Latitude: 18.282227044

Input Longitude: -70.32871990

Datum: (WGS84) World Geodetic System 1984

Precision: exact

Offset Distance: 5

Radial of Feature: 2.72

Measurement Error: .010

Distance Units: km

Precision: 1 km

Calculate Copy Go here

Latitude	Longitude	Uncertainty (m)	Datum
18.3274008	-70.3287199	5883	(WGS84) World Geodetic System 1984

Precision: 0.0000001 Date: 2022-01-27T01:20: Georeferenced by: Protocol: protocol not recorded

Distance Converter: [] km = [] km

Scale Converter: [] mm 1:24000 = [] km

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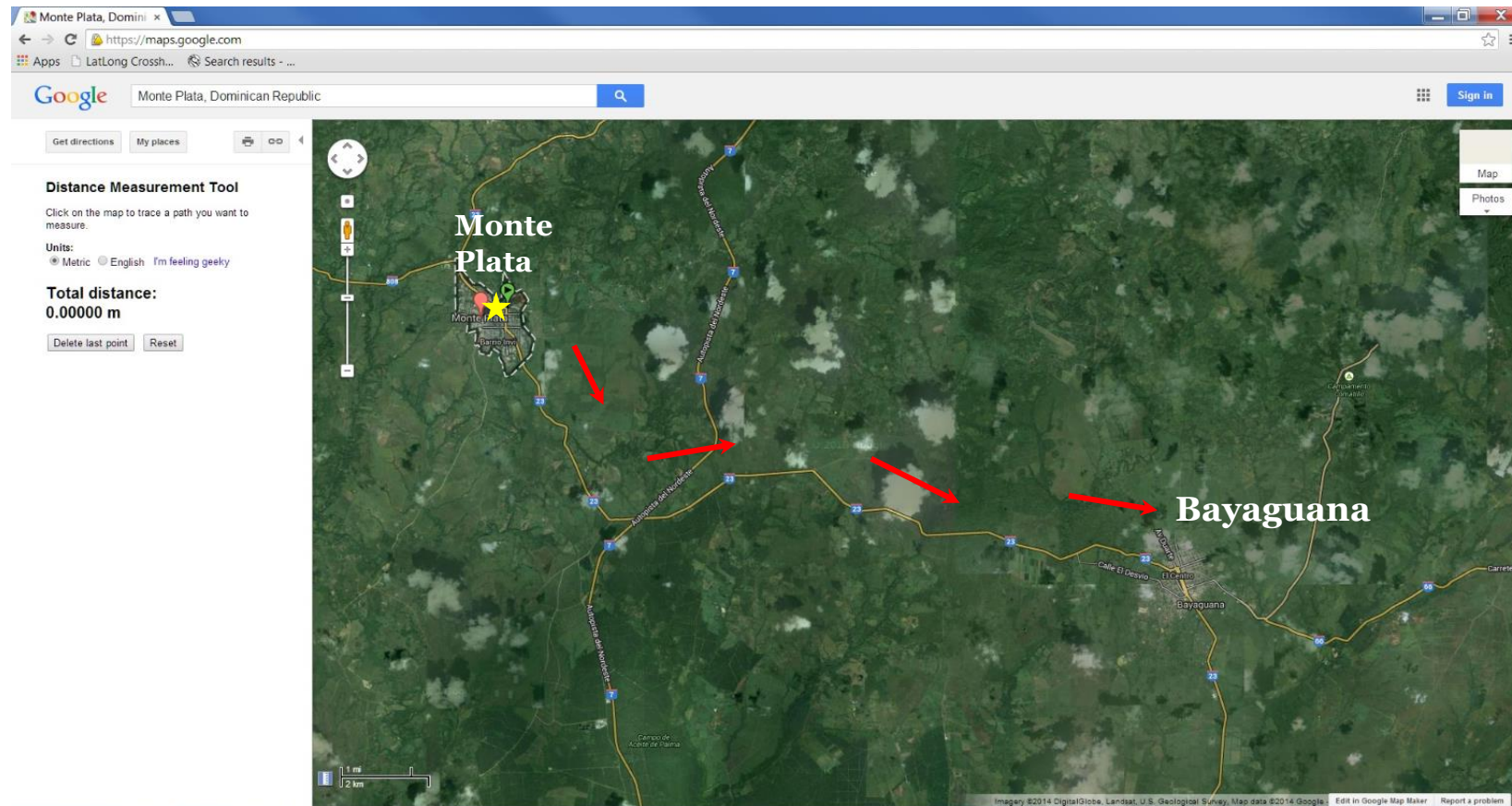
Offset at a Heading: 5 km N of Baní

Offset – Offset along a Path

Example: 3 km along Monte Plata – Bayaguana Road, D.R.

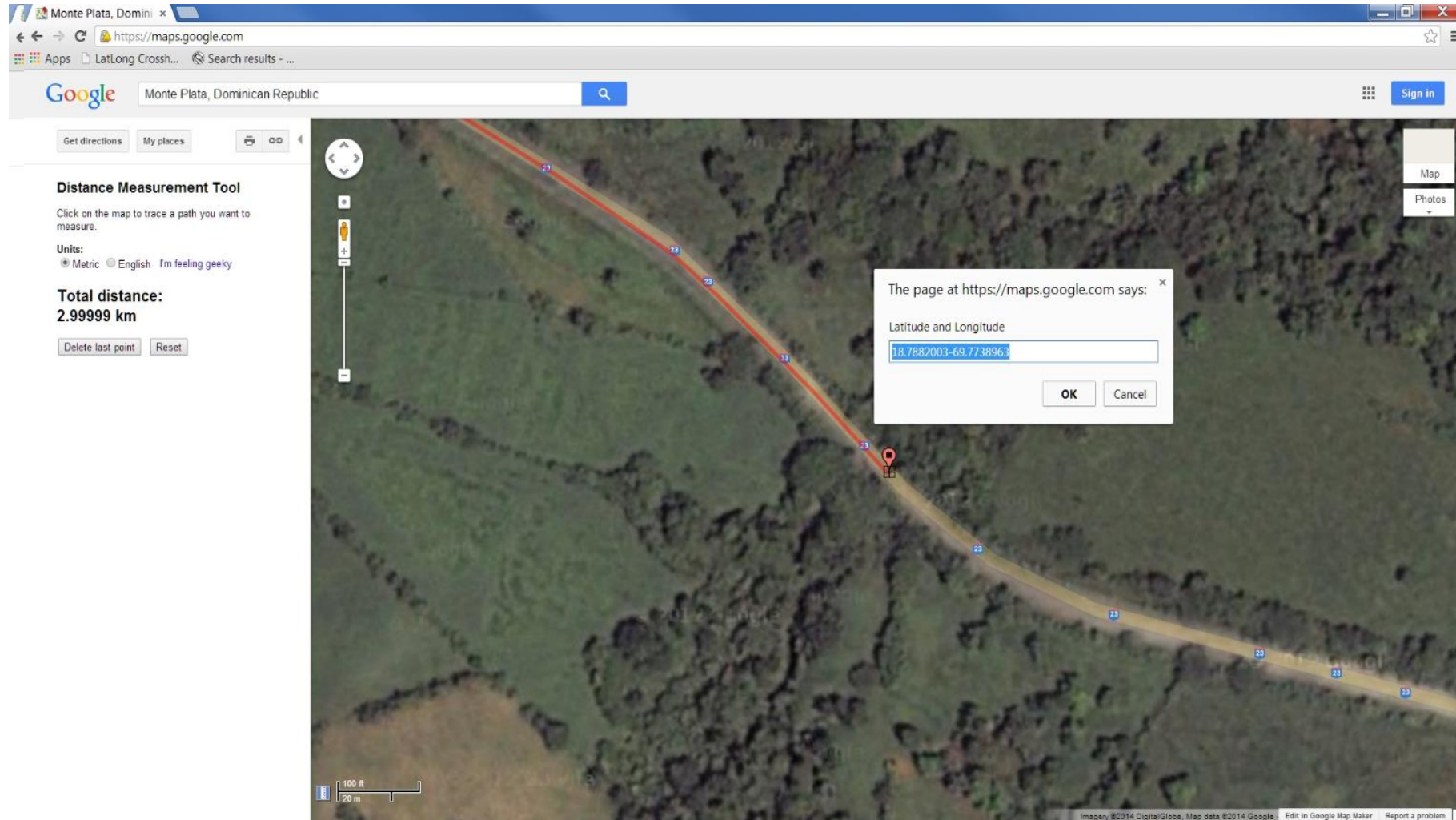
- Use Google Maps to locate road between the cities
- Measure 3 km along road in specified direction from starting location, obtain coordinates
- Find radial for road segment within starting city
- Input information into the MaNIS Georef. Calc. to find the uncertainty radius

Offset along a Path



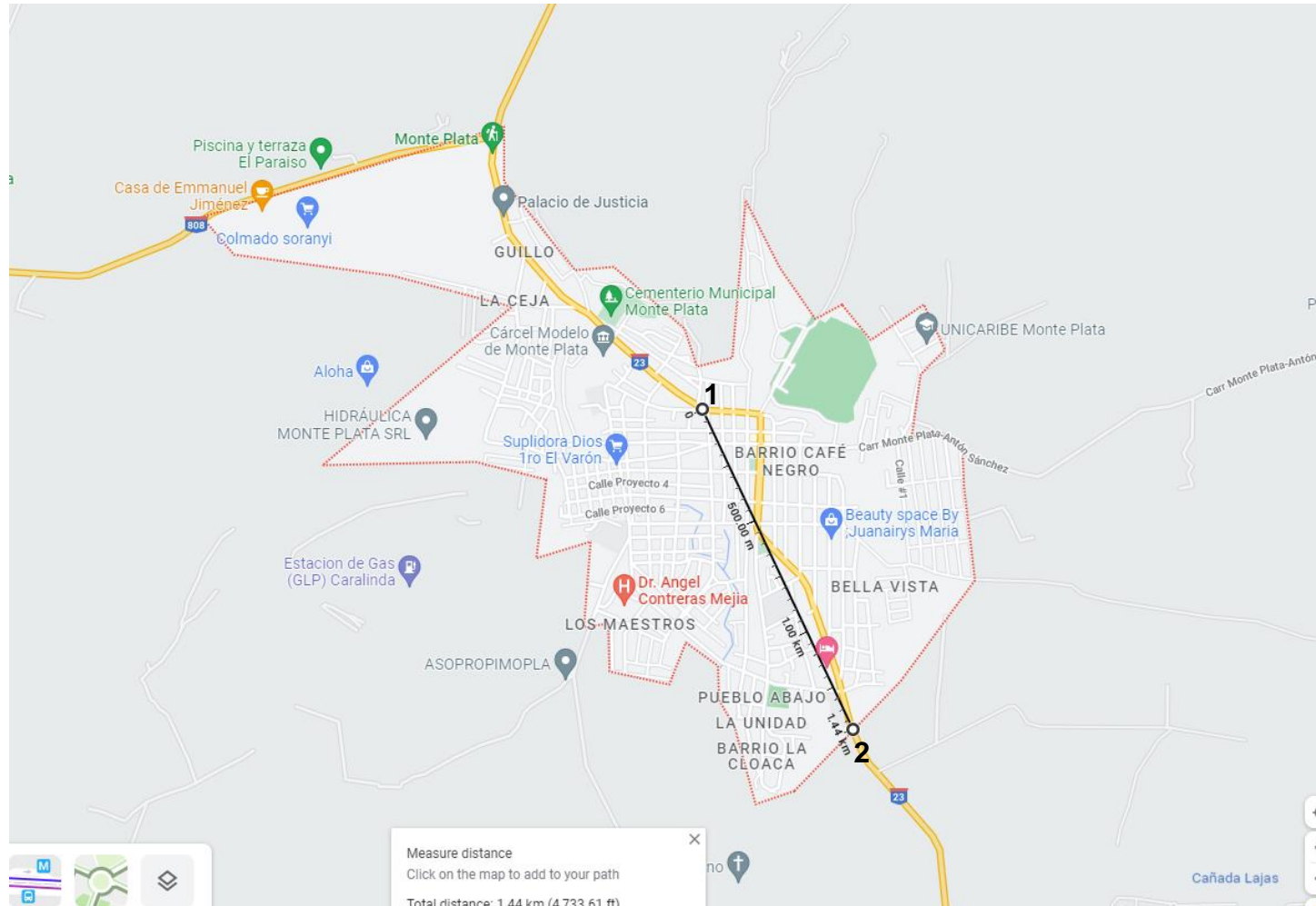
Locate road connecting the cities. Begin measuring offset from approximate center of road segment within Monte Plata

Offset along a Path



Zoom in and precisely measure along the road to the offset distance stated (toward the city of Bayaguana)

Offset along a Path



The starting node of the ruler (1) denotes the starting location of the offset, the second node (2) represents the farthest reaches of the road within the city limits.

Offset along a Path

LOCALITY TYPE	CALCULATION PROCEDURE (instructions on how to use the Georeferencing Calculator)
<p>Offset</p> <p>Offset along a path</p> <p><i>Examples: "7.9 mi N Beatty, on US 95", "3 km en el Rio Jimenez arriba de Anita Grande", "left bank of the Mississippi River, 16 mi downstream from St. Louis", "Ruta Nacional 81, 8 km W de Ingeniero Guillermo Nicasio Juárez"</i></p>	<p>Calculation Type: "Error only - enter Lat/Long for the actual locality"</p> <p>Locality Type: <u>"Distance along a Path"</u> ←</p> <p>Coordinates: Find the center of the named place as you would for Named Place – Bounded Area or Named Place – Undefined Area, as appropriate. Use a measuring tool on a printed or digital map to follow the specified route for the given distance. Use the end point as the coordinates. If no specific path is specified in the locality description, be sure to note in georeferenceRemarks which path was measured.</p> <p>Extent: As for Named Place – Bounded Area or Named Place – Undefined Area, as appropriate.</p>

MaNIS: Locality Type

Locality Type: Distance along a path.

The screenshot shows the 'Georeferencing Calculator' interface. At the top left, there is a language dropdown set to 'English'. The main title is 'Georeferencing Calculator'. Below the title, there are several input fields and dropdown menus: 'Locality Type' is set to 'Distance along path (e.g., 13 mi E (by road) Bakersfield)', 'Coordinate Source' is 'Google Earth/Maps >2008', 'Coordinate Format' is 'decimal degrees', 'Input Latitude' and 'Input Longitude' are empty text boxes, 'Datum' is '(WGS84) World Geodetic System 1984', and 'Precision' is 'exact'. On the right side, there are three more input fields: 'Radial of Feature' is '13.457', 'Measurement Error' is '010', and 'Distance Units' is 'km'. Below these is another 'Precision' dropdown set to '1 km'. There are three buttons: 'Calculate', 'Copy', and 'Go here'. Below the buttons is a table with columns: 'Latitude', 'Longitude', 'Uncertainty (m)', 'Datum', 'Precision', 'Date', 'Georeferenced by', and 'Protocol'. The 'Date' field contains the value '2021-05-18T17:19:1' and the 'Protocol' dropdown is set to 'protocol not recorded'. At the bottom, there are two conversion sections: 'Distance Converter' and 'Scale Converter', each with input fields and dropdown menus for units and scale. The footer contains 'Version 20210127en' and 'Copyright 2020 Rauthiflor LLC'.

Latitude	Longitude	Uncertainty (m)	Datum

Precision	Date	Georeferenced by	Protocol
	2021-05-18T17:19:1		protocol not recorded

Offset Along a Path: 3 km along Monte Plata – Bayaguana road (road 23) in Dominican Republic.

MaNIS: Coordinate Source, Format, Datum, Precision

Coordinate Source: Google Maps > 2008

The basis of how the coordinates were located.

Coordinate Format: Based on coordinate source (Google Maps) = decimal degrees

Datum: WGS84 (Google Maps)

Precision (of the coordinates): exact (Google Maps)

The screenshot shows the 'Georeferencing Calculator' web application. The interface includes a language dropdown set to 'English', a 'Locality Type' dropdown with the text 'Distance along path (e.g., 13 mi E (by road) Bakersfield)', a 'Coordinate Source' dropdown set to 'Google Earth/Maps >2008', and a 'Coordinate Format' dropdown set to 'decimal degrees'. Input fields for 'Input Latitude' and 'Input Longitude' are present but empty. The 'Datum' dropdown is set to '(WGS84) World Geodetic System 1984', and the 'Precision' dropdown is set to 'exact'. On the right side, there are input fields for 'Radial of Feature' (13.457), 'Measurement Error' (.010), 'Distance Units' (km), and 'Precision' (1 km). Below these are 'Calculate', 'Copy', and 'Go here' buttons. A table below the buttons has columns for 'Latitude', 'Longitude', 'Uncertainty (m)', and 'Datum'. Below the table are fields for 'Precision', 'Date' (2021-05-18T17:19:), 'Georeferenced by', and 'Protocol' (protocol not recorded). At the bottom, there are 'Distance Converter' and 'Scale Converter' sections with input fields and dropdown menus. The footer shows 'Version 20210127en' and 'Copyright 2020 Rauthiflor LLC'.

Offset Along a Path: 3 km along Monte Plata – Bayaguana road (road 23) in Dominican Republic.

MaNIS: Locality Type

Radial of Feature: Extent of the linear feature within the bounds of the starting location (city of Monte Plata). Enter extent in the same units as the offset distance (consistency!)

Measurement Error: Determined to be 10 m (= 0.010 km)

Distance Precision: Dependent on the offset distance. The 3 km offset = 1 km distance precision.

Distance **Precision**

3 km → **1 km**

Georeferencing Calculator

English

Locality Type: Distance along path (e.g., 13 mi E (by road) Bakersfield)

Coordinate Source: Google Earth/Maps >2008

Coordinate Format: decimal degrees

Input Latitude: []

Input Longitude: []

Datum: (WGS84) World Geodetic System 1984

Precision: exact

Radial of Feature: 13.457

Measurement Error: .010

Distance Units: km

Precision: 1 km

Calculate Copy Go here

Latitude	Longitude	Uncertainty (m)	Datum

Precision	Date	Georeferenced by	Protocol
	2021-05-18T17:19:1		protocol not recorded

Distance Converter: [] km = [] km

Scale Converter: [] mm 1:24000 = [] km

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Offset Along a Path: 3 km along Monte Plata – Bayaguana road (road 23) in Dominican Republic.

MaNIS: Calculate

Calculate!

Georeferencing Calculator

English

Locality Type: Distance along path (e.g., 13 mi E (by road) Bakersfield)

Coordinate Source: Google Earth/Maps >2008

Coordinate Format: decimal degrees

Input Latitude: 0

Input Longitude: 0

Datum: (WGS84) World Geodetic System 1984

Precision: exact

Radial of Feature: 13.457

Measurement Error: .010

Distance Units: km

Precision: 1 km

Calculate Copy Go here

Latitude	Longitude	Uncertainty (m)	Datum
0	0	13975	(WGS84) World Geodetic System 1984

Precision	Date	Georeferenced by	Protocol
0.0000001	2021-05-18T19:11:2		protocol not recorded

Distance Converter: [] km = [] km

Scale Converter: [] mm 1:24000 = [] km

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Offset Along a Path: 3 km along Monte Plata – Bayaguana road (road 23) in Dominican Republic.



QUESTIONS?

[Google Maps](#)

[GEOLocate Web Application](#)

[MaNIS Georef. Calculator](#)

[Georef. Quick Ref. Guide](#)

NYBG
NEW YORK BOTANICAL GARDEN

Credits

This is an updated compilation of information provided by the iDigBio's first Train-the-Trainers Georeferencing Workshop (put together by K. Watson, S. Gottschalk, S. Ascencio, 2013), altered to fit NYBG georeferencing needs over the years (<https://www.idigbio.org/content/idigbios-first-train-trainers-georeferencing-workshop>)

Georeferencing Quick Reference Guide (2020)

Zermoglio PF, Chapman AD, Wieczorek JR, Luna MC & Bloom DA. 2020. Georeferencing Quick Reference Guide. Copenhagen: GBIF Secretariat. <https://doi.org/10.35035/e09p-h128>

Georeferencing Quick Reference Guide (2012): consolidated guide for inputs for the MaNIS Georeferencing Calculator
Wieczorek J, Bloom D, Constable H, Fang J, Koo M, Spencer C & Yamamo K (2012) Georeferencing Quick Reference Guide, version 2012-10-08. <https://www.idigbio.org/wiki/images/1/1e/GeoreferencingQuickReferenceGuide.pdf>

BioGeomancer Guide to Best Practices for Georeferencing (2006) is a basis for documentation of collecting & georeferencing protocols: Chapman, A.D. and J. Wieczorek (eds). 2006. Guide to Best Practices for Georeferencing. Copenhagen: Global Biodiversity Information Facility. <https://www.gbif.org/document/80536/biogeomancer-guide-to-best-practices-in-georeferencing> (2006 version). Chapman AD & Wieczorek JR (2020) Georeferencing Best Practices. Copenhagen: GBIF Secretariat. <https://doi.org/10.15468/doc-gg7h-s853> (2020 version)

The MaNIS Georeferencing Calculator is a JavaScript application used in finding an uncertainty radius that incorporates all possible sources of error in the georeferencing process (tool: <http://georeferencing.org/georefcalculator/gc.html>, manual: <http://georeferencing.org/georefcalculator/docs/GeoreferencingCalculatorManual.pdf>)

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