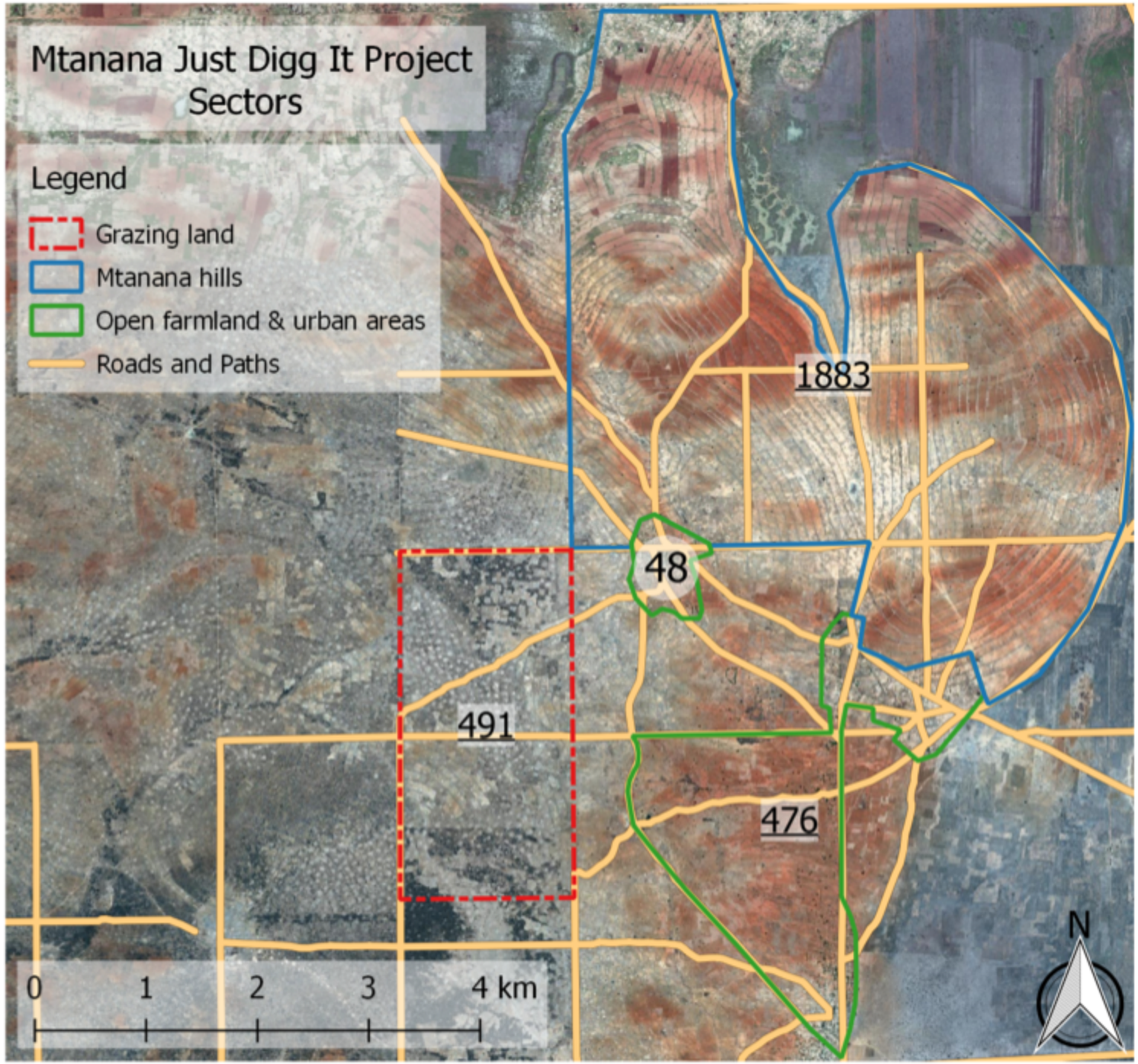
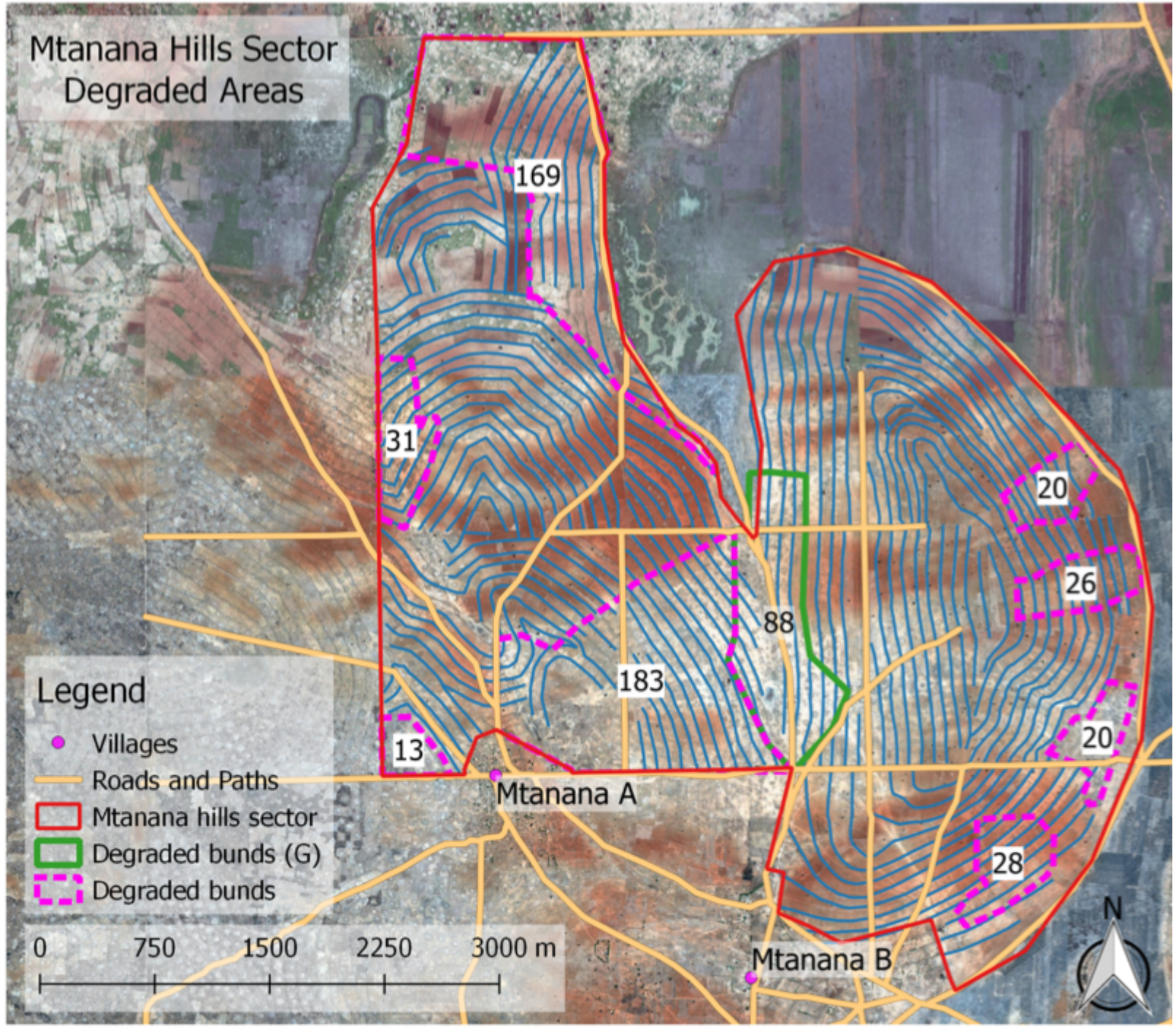
Drones for water management and natural resource management

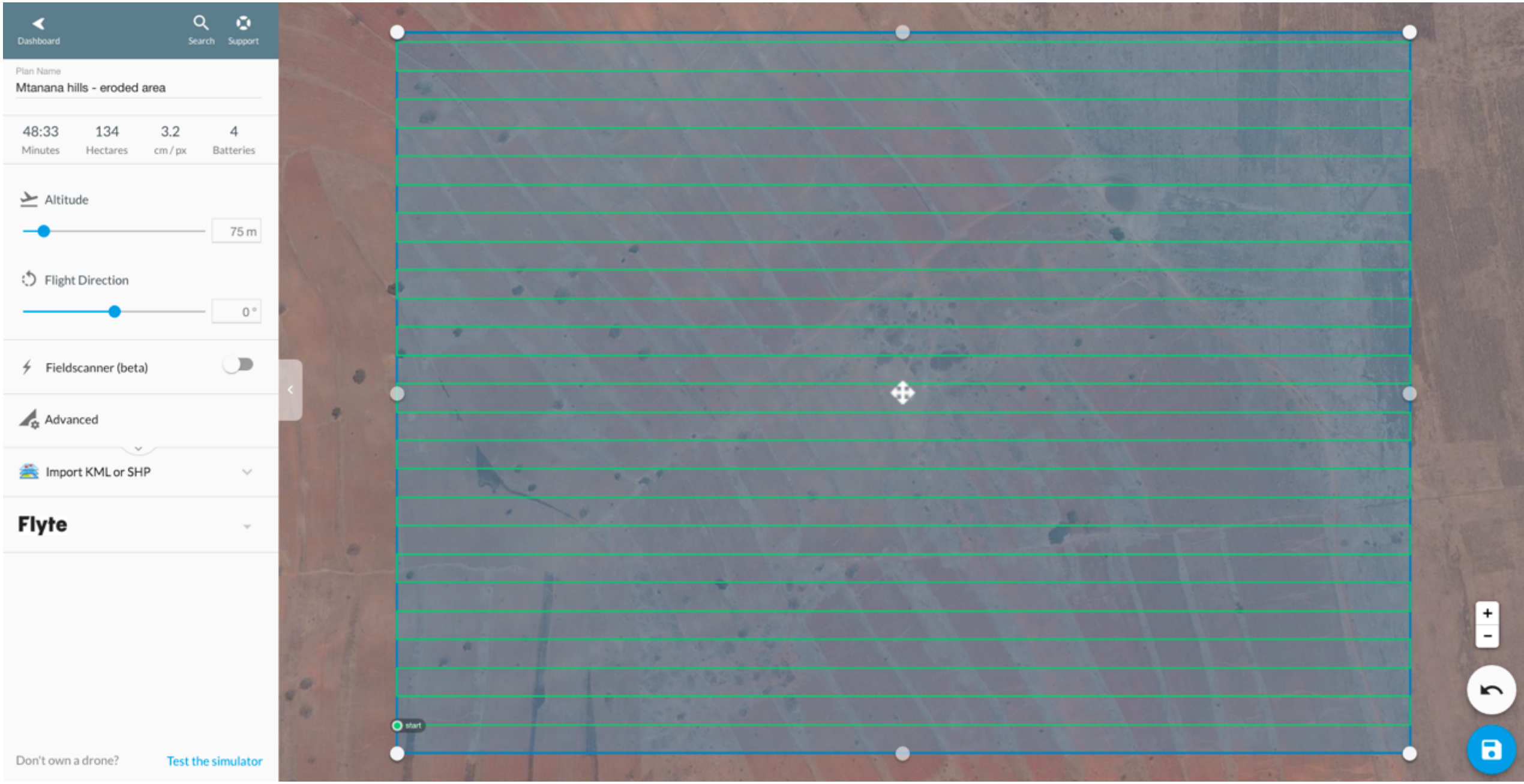
- Planning
- Monitoring
- Documenting

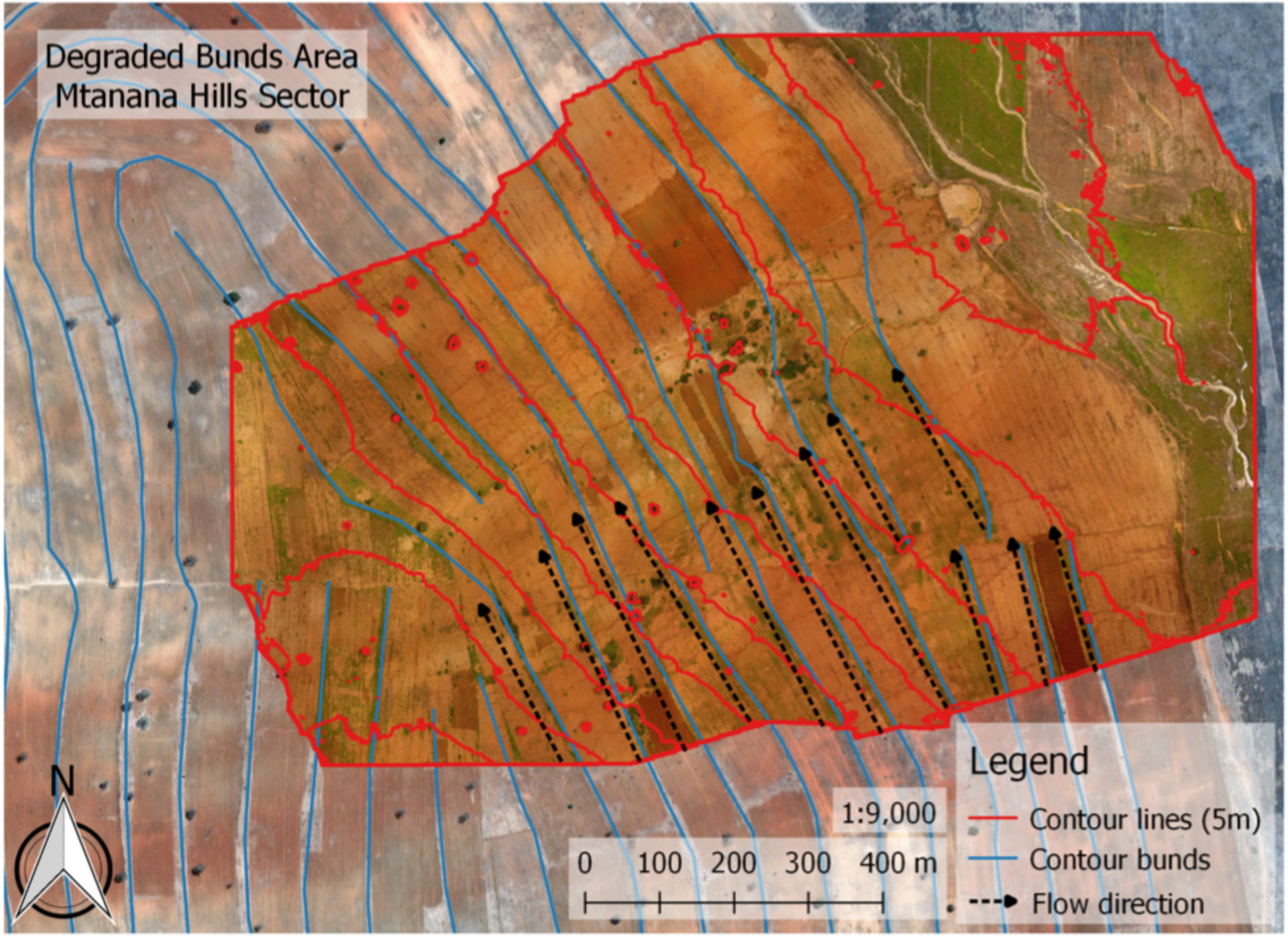

Mtanana Just Digg It Project
Sectors
Legend
Grazing land
Mtanana hills
Open farmland & urban areas
Roads and Paths
1883
48
491
476
0
1
2
3
4 km
N

Video flood


Mtanana Hills Sector
Degraded Areas
169
31
20
26
88
183
20
13
28
Mtanana A
Mtanana B
Legend
Villages
Roads and Paths
Mtanana hills sector
Degraded bunds (G)
Degraded bunds
0
750
1500
2250
3000 m
N

Video hills

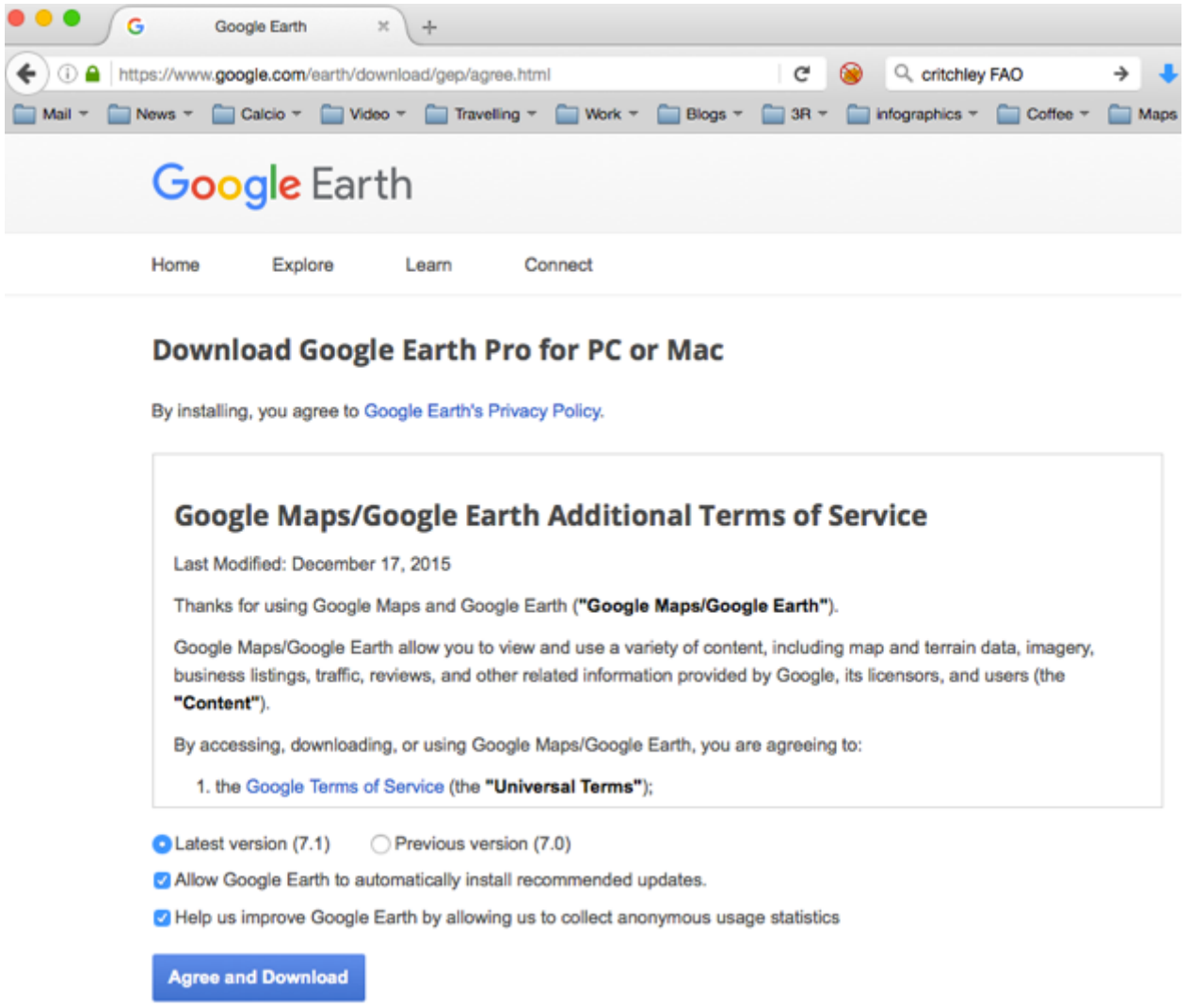

Dashboard
Search
Support
Plan Name
Mtanana hills - eroded area
48:33
Minutes
134
Hectares
3.2
cm / px
4
Batteries
Altitude
75 m
Flight Direction
0 °
Fieldscanner (beta)
Advanced
Import KML or SHP
Flyte
Don't own a drone?
Test the simulator
start


Degraded Bunds Area
Mtanana Hills Sector
N
1:9,000
0 100 200 300 400 m
Legend
Contour lines (5m)
Contour bunds
Flow direction

Google earth Pro

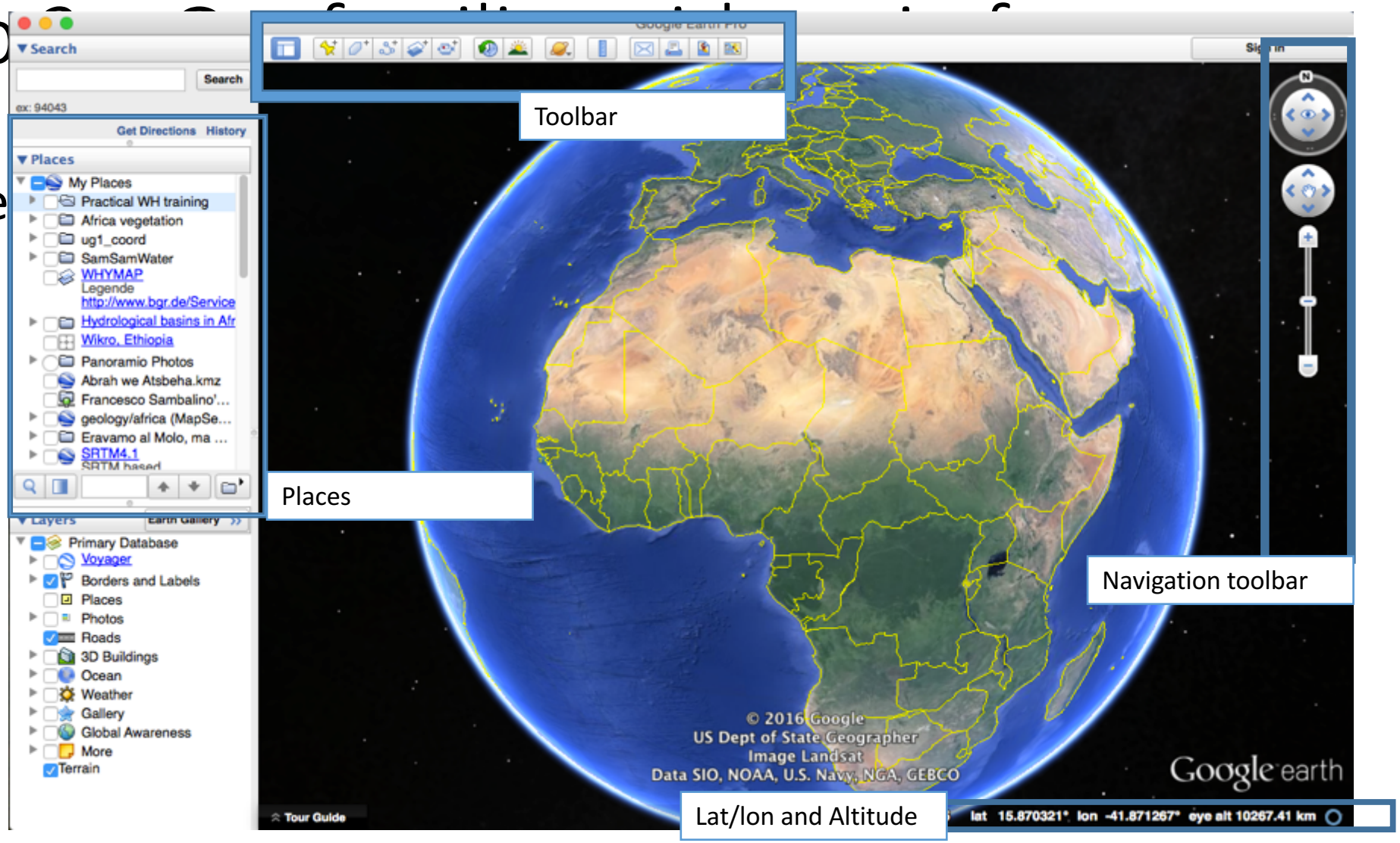
- Desktop software developed by google that allows users to have a 3D overview of landscapes and carry out some basic measurements
- Each satellite image is superimposed on a “hidden” Digital Elevation Model, which permits to have 3D visualization and thus make simple slope calculations.
- Third parties provide packages (called overlays) which permits to lay thematic layers over the standard images provided by google.

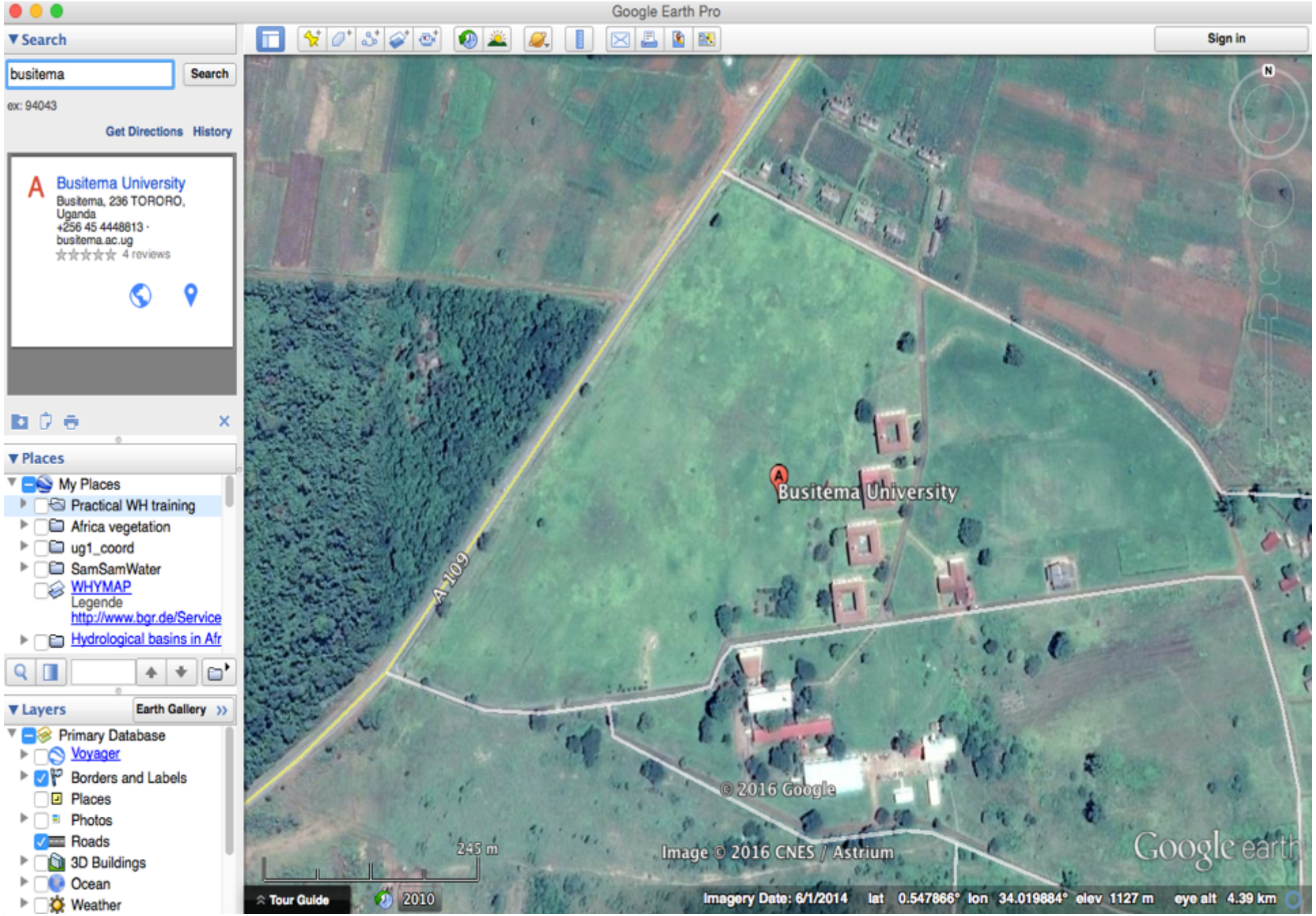
- Download google earth Pro from google website:
  - https://www.google.com/earth/explore/products/desktop.html
- Install the downloaded software on your laptop (PC or MAC)

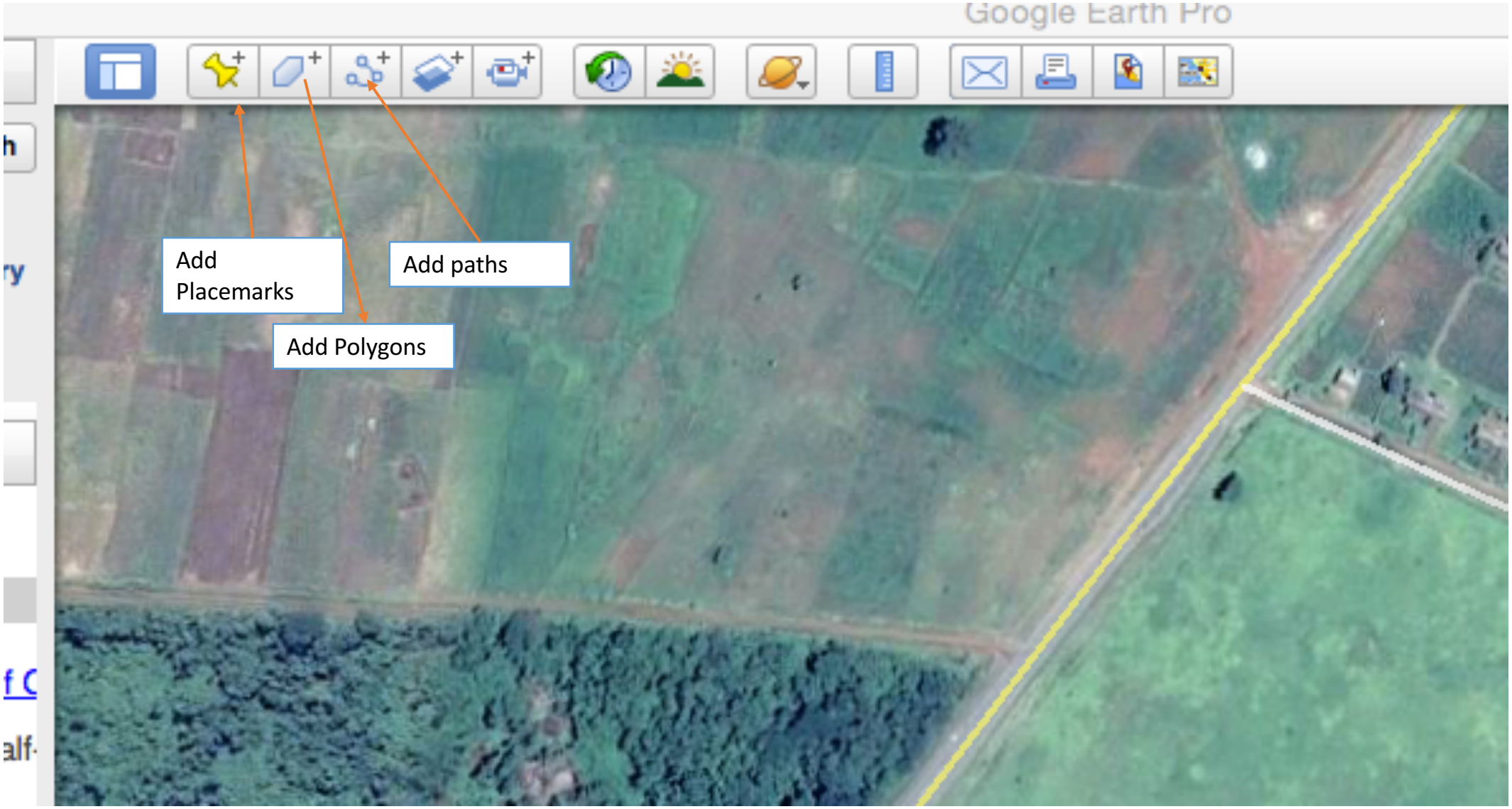


Step

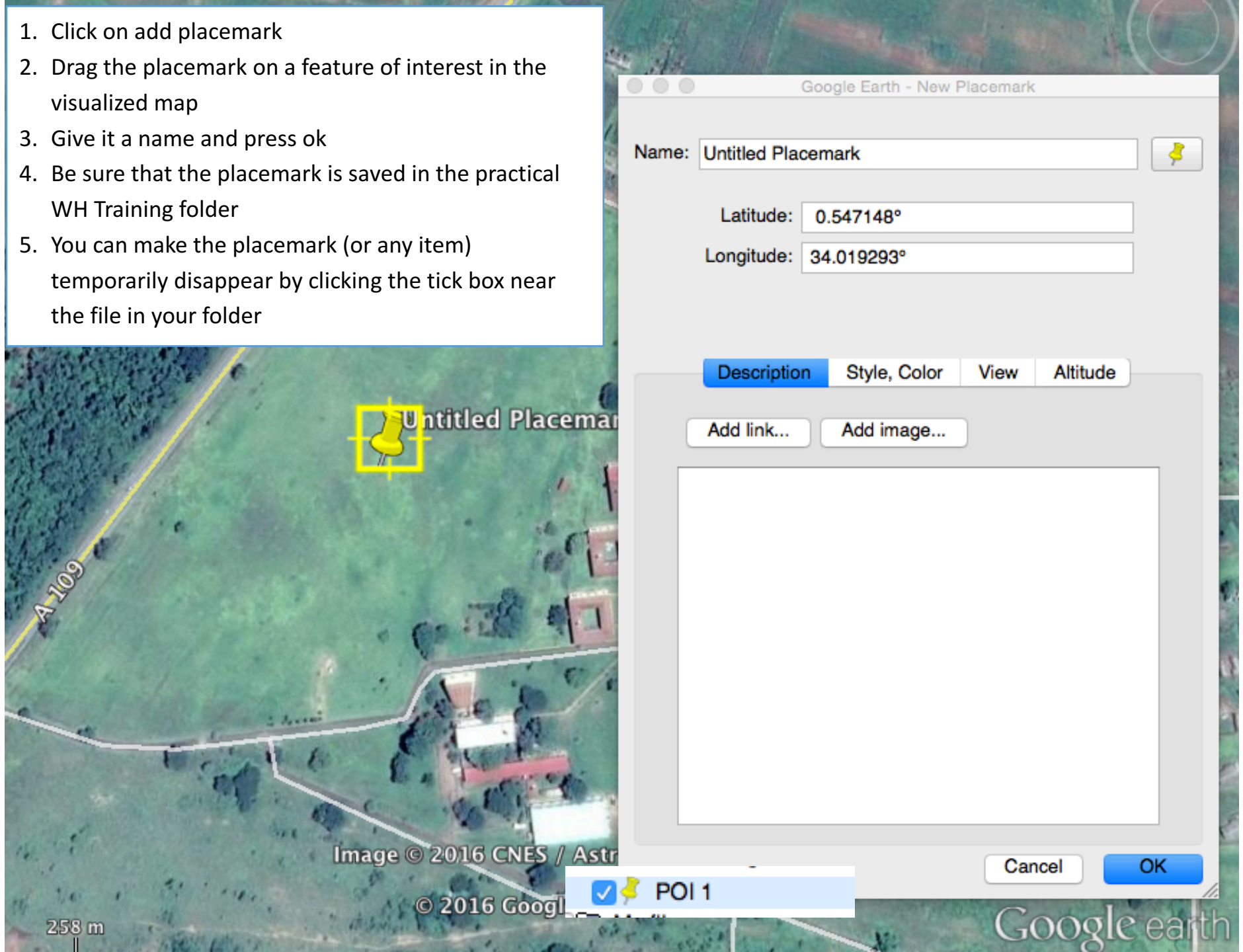
1. Ope

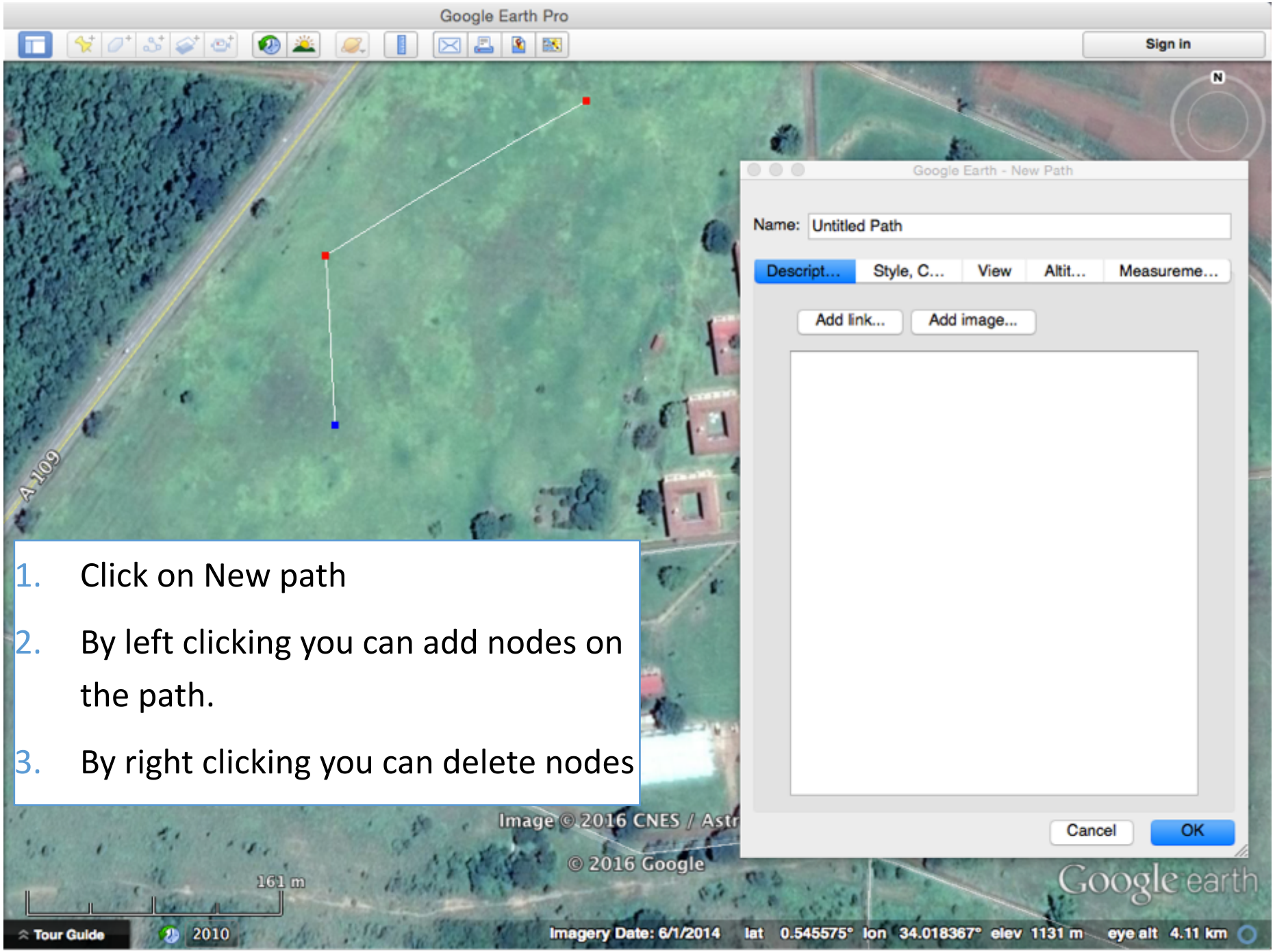

Search
Search
ex: 94043
Get Directions
History
Places
My Places
Practical WH training
Africa vegetation
ug1_coord
SamSamWater
WHYMAP
Legende
http://www.bgr.de/Service
Hydrological basins in Afr
Wikro, Ethiopia
Panoramio Photos
Abrah we Atsbeha.kmz
Francesco Sambalino'...
geology/africa (MapSe...
Eravamo al Molo, ma ...
SRTM4.1
Layers
Earth Gallery
Primary Database
Voyager
Borders and Labels
Places
Photos
Roads
3D Buildings
Ocean
Weather
Gallery
Global Awareness
More
Terrain
Toolbar
Places
Navigation toolbar
Lat/lon and Altitude
© 2016 Google
US Dept of State Geographer
Image Landsat
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
Google earth
Tour Guide
lat 15.870321° lon -41.871267° eye alt 10267.41 km


Google Earth Pro
Search
busitema
Search
ex: 94043
Get Directions
History
Busitema University
Busitema, 236 TORORO, Uganda
+256 45 4448813 · busitema.ac.ug
4 reviews
Places
My Places
Practical WH training
Africa vegetation
ug1_coord
SamSamWater
WHYMAP
Legende
http://www.bgr.de/Service
Hydrological basins in Afr
Layers
Earth Gallery
Primary Database
Voyager
Borders and Labels
Places
Photos
Roads
3D Buildings
Ocean
Weather
Sign in
Busitema University
A 109
© 2016 Google
Image © 2016 CNES / Astrium
245 m
Google earth
Tour Guide
2010
Imagery Date: 6/1/2014 lat 0.547866° lon 34.019884° elev 1127 m eye alt 4.39 km

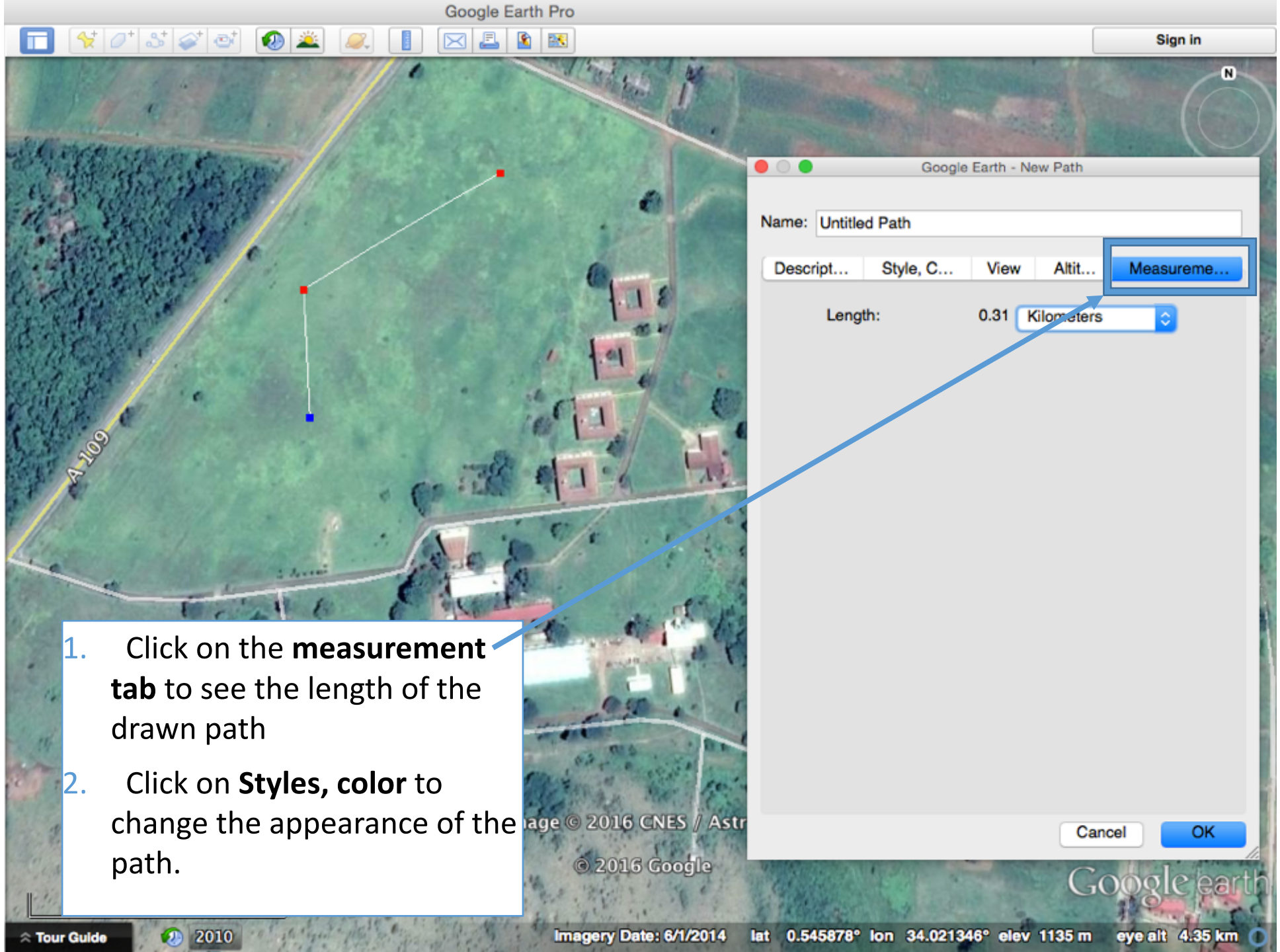

Google Earth Pro
Add Placemarks
Add paths
Add Polygons

1. Click on add placemark
2. Drag the placemark on a feature of interest in the visualized map
3. Give it a name and press ok
4. Be sure that the placemark is saved in the practical WH Training folder
5. You can make the placemark (or any item) temporarily disappear by clicking the tick box near the file in your folder

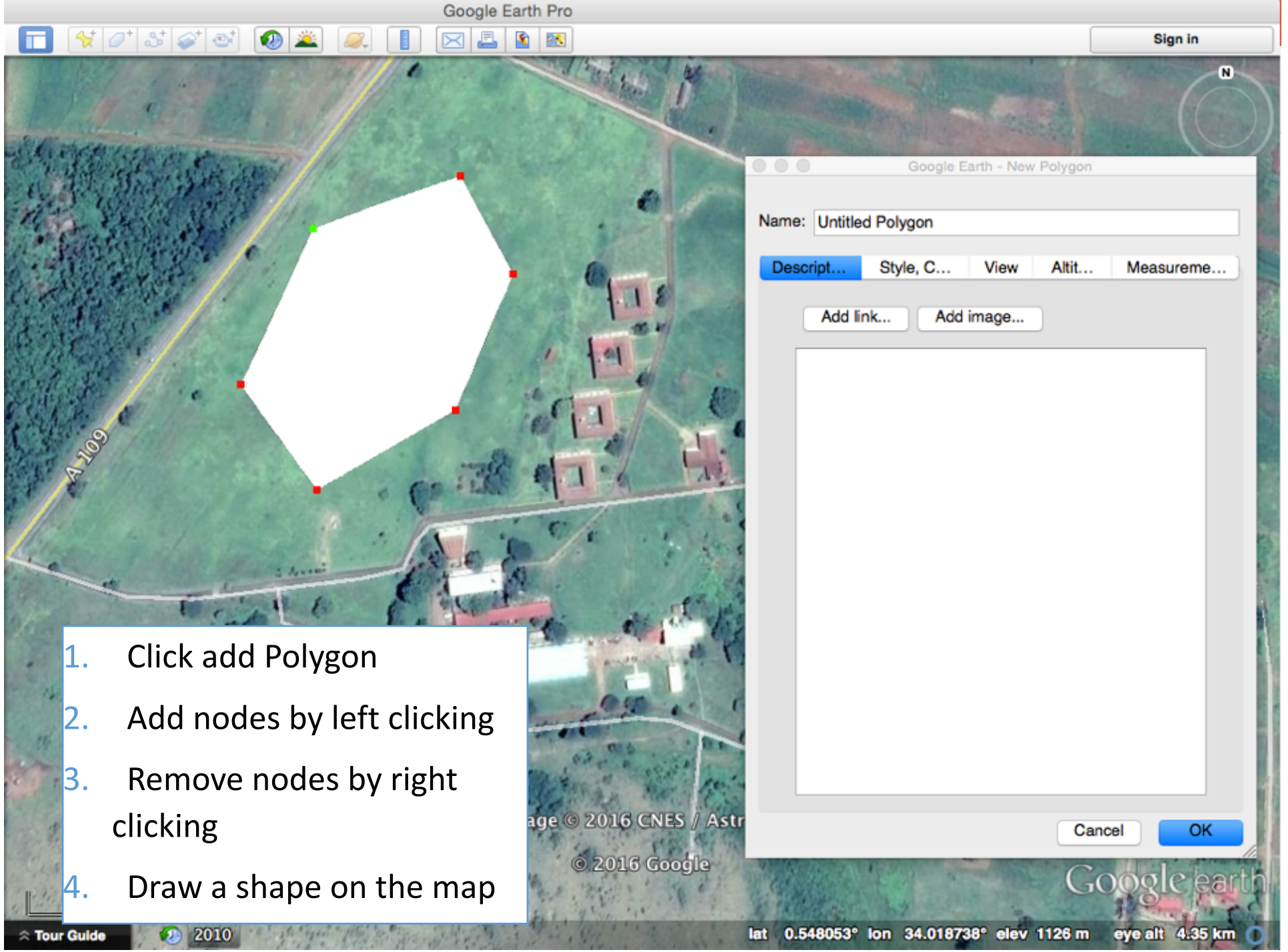


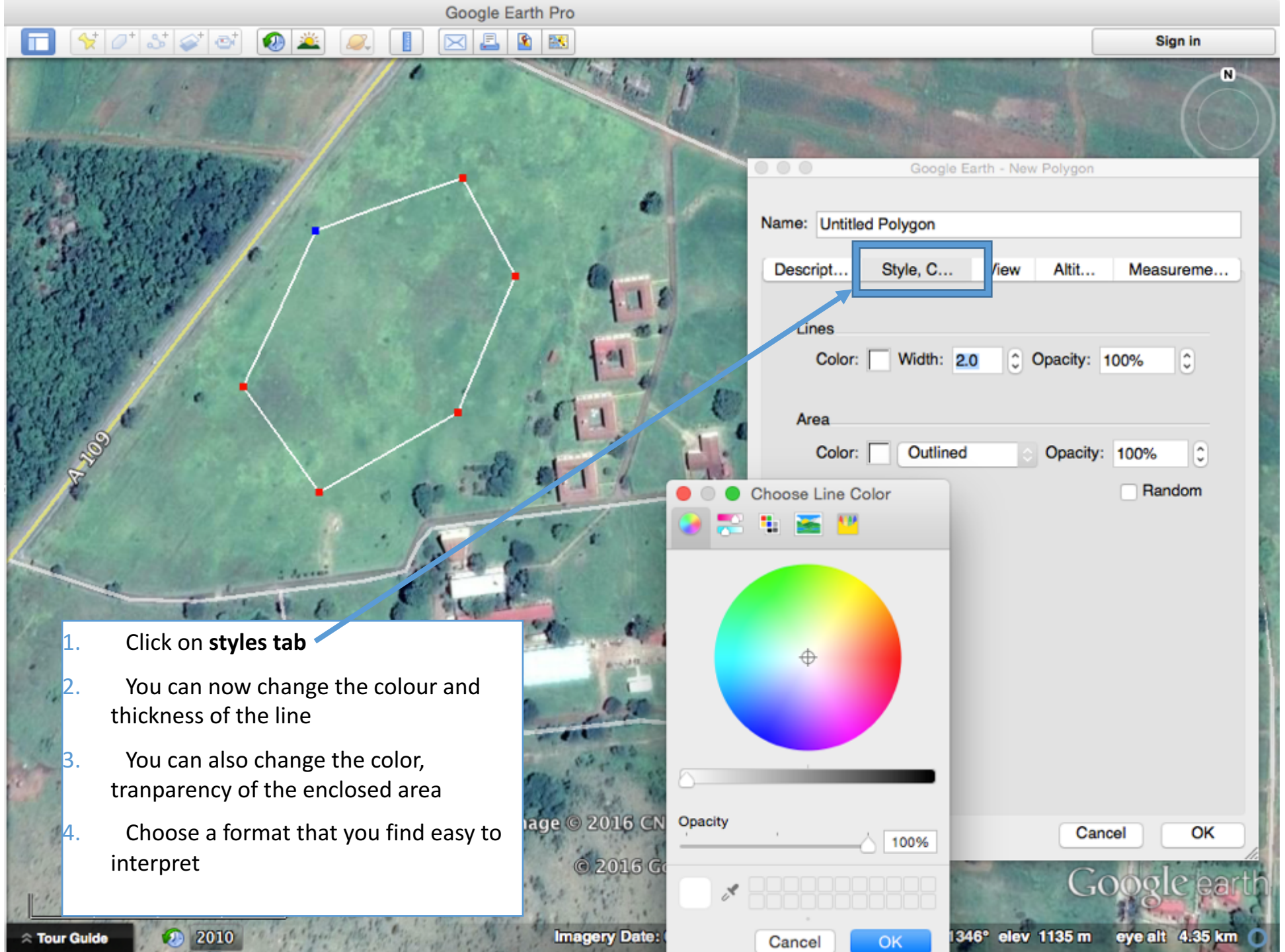


1. Click on New path
2. By left clicking you can add nodes on the path.
3. By right clicking you can delete nodes

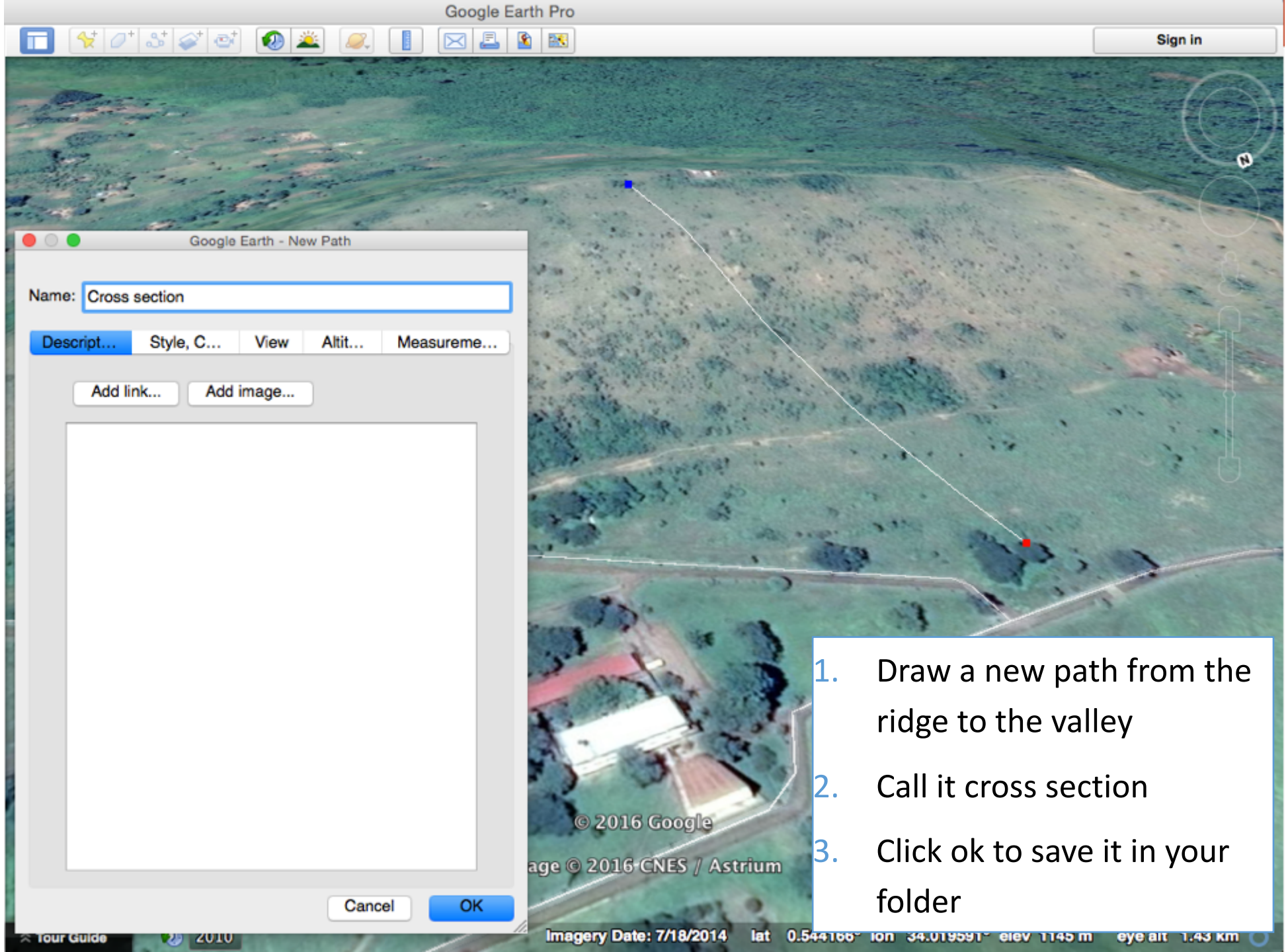


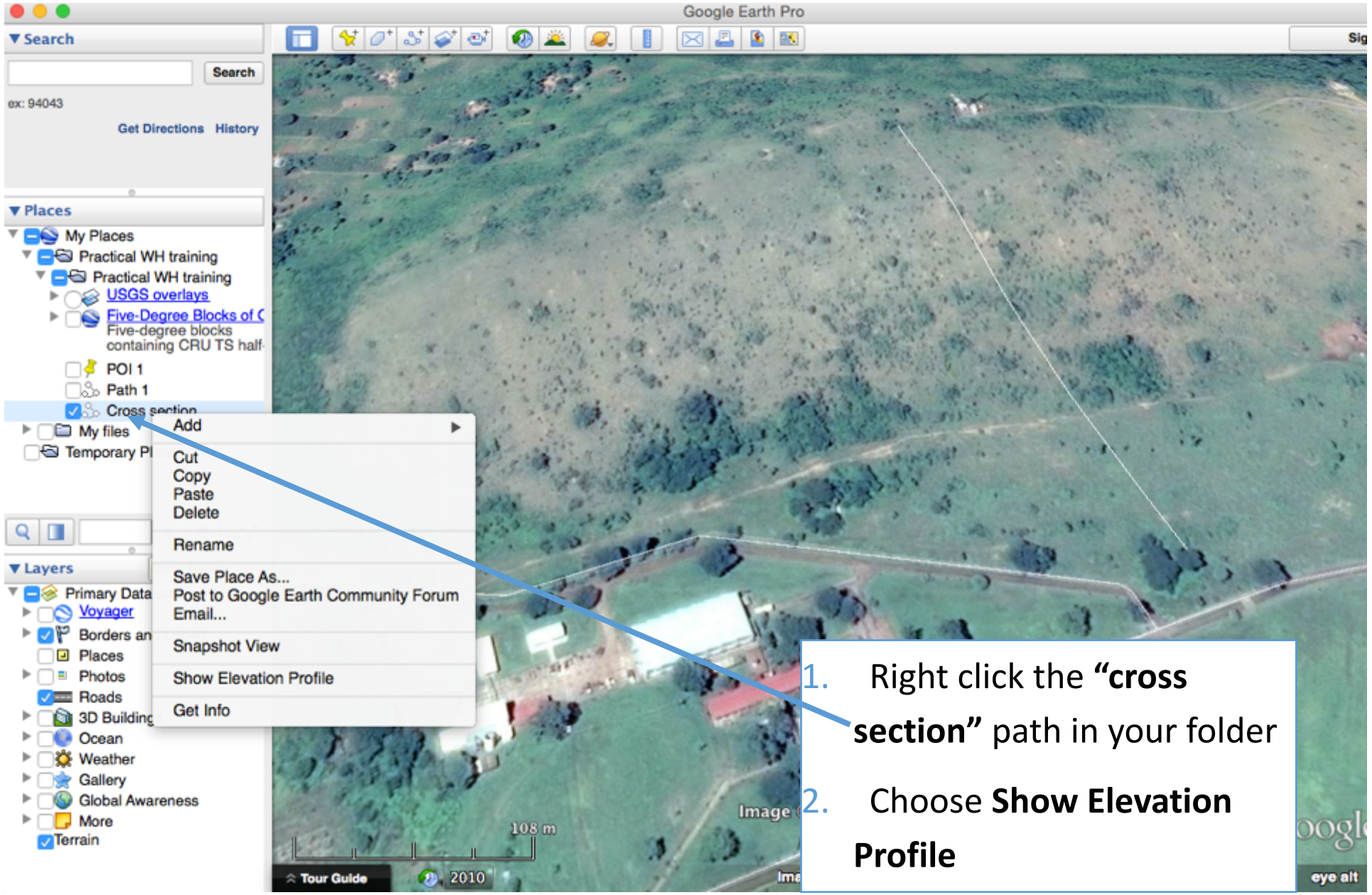
1. Click on the **measurement tab** to see the length of the drawn path
2. Click on **Styles, color** to change the appearance of the path.

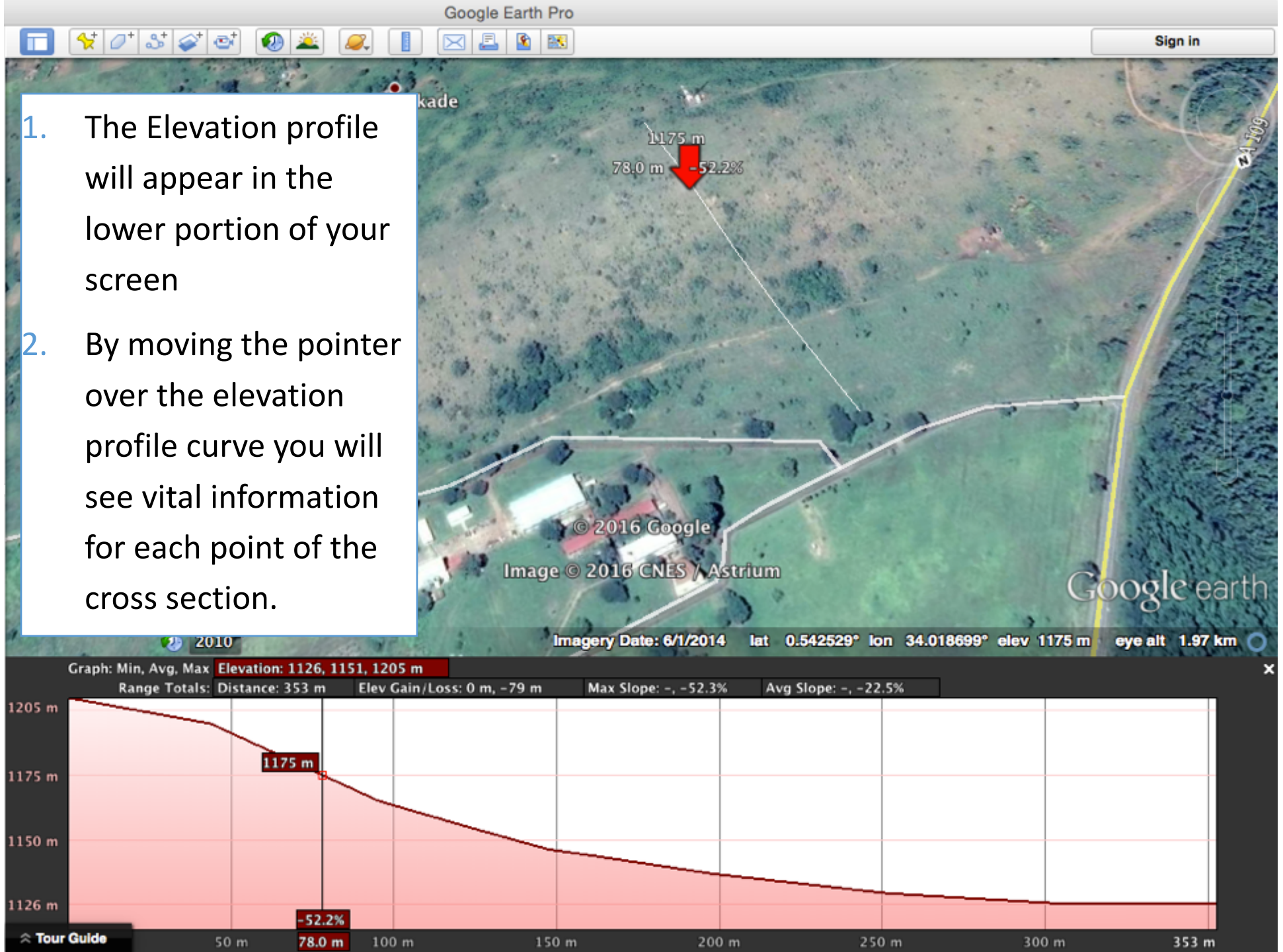

Google Earth Pro
Sign in
N
Google Earth - New Polygon
Name: Untitled Polygon
Descript...
Style, C...
View
Altit...
Measureme...
Add link...
Add image...
Cancel
OK
A 109
1. Click add Polygon
2. Add nodes by left clicking
3. Remove nodes by right clicking
4. Draw a shape on the map
© 2016 Google
Google earth
Tour Guide
2010
lat 0.548053° lon 34.018738° elev 1126 m eye alt 4.35 km



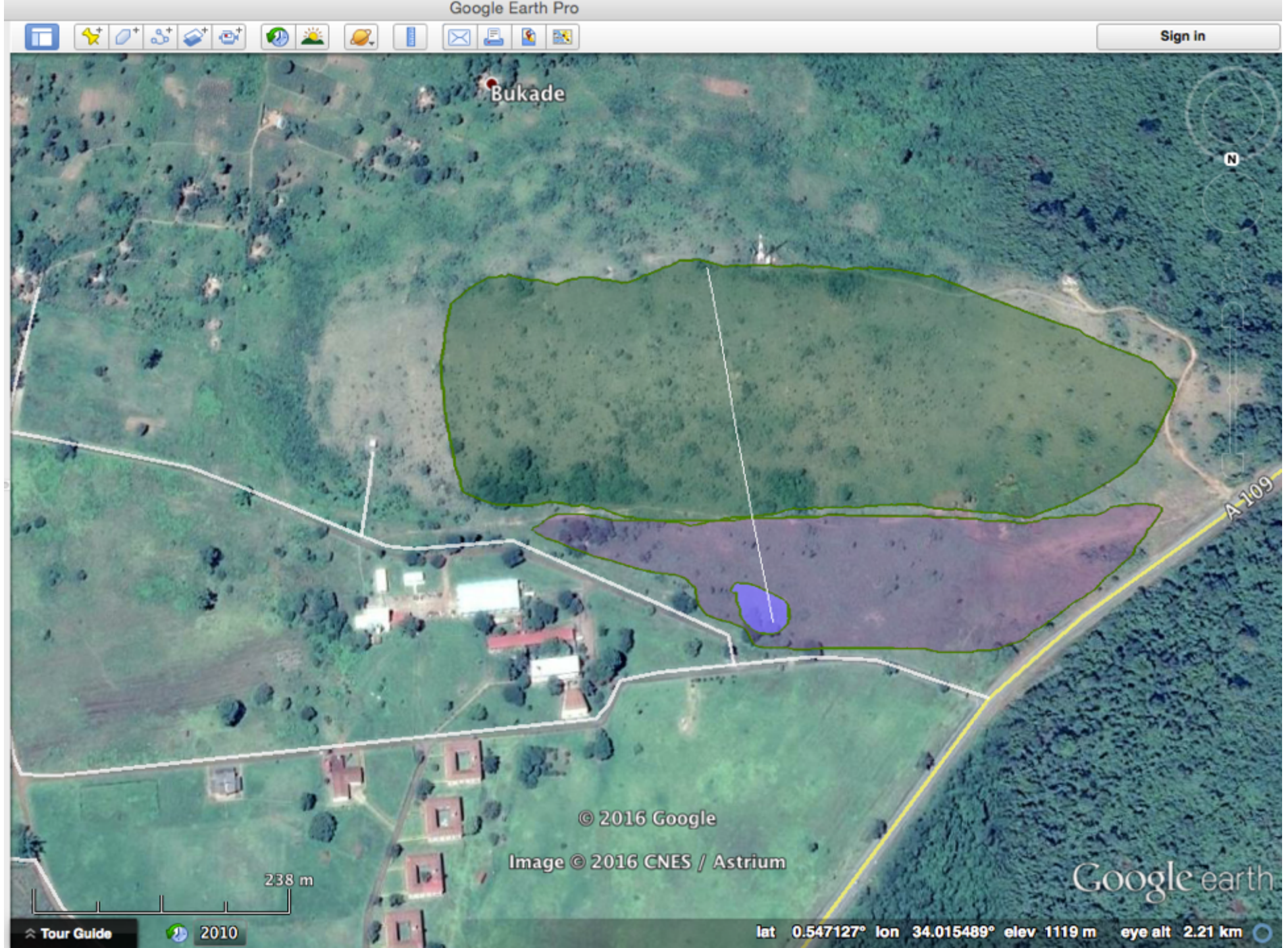
1. Click on **styles tab**
2. You can now change the colour and thickness of the line
3. You can also change the color, tranparency of the enclosed area
4. Choose a format that you find easy to interpret


Google Earth Pro
Sign in
Google Earth - New Path
Name: Cross section
Descript...
Style, C...
View
Altit...
Measureme...
Add link...
Add image...
Cancel
OK
© 2016 Google
age © 2016 CNES / Astrium
Imagery Date: 7/18/2014
1. Draw a new path from the ridge to the valley
2. Call it cross section
3. Click ok to save it in your folder


Google Earth Pro
Search
Search
ex: 94043
Get Directions
History
Places
My Places
Practical WH training
Practical WH training
USGS overlays
Five-Degree Blocks of C
Five-degree blocks containing CRU TS half
POI 1
Path 1
Cross section
My files
Temporary Pl
Add
Cut
Copy
Paste
Delete
Rename
Save Place As...
Post to Google Earth Community Forum
Email...
Snapshot View
Show Elevation Profile
Get Info
Layers
Primary Data
Voyager
Borders an
Places
Photos
Roads
3D Building
Ocean
Weather
Gallery
Global Awareness
More
Terrain
108 m
Tour Guide
2010
Image
eye alt
1. Right click the "cross section" path in your folder
2. Choose Show Elevation Profile



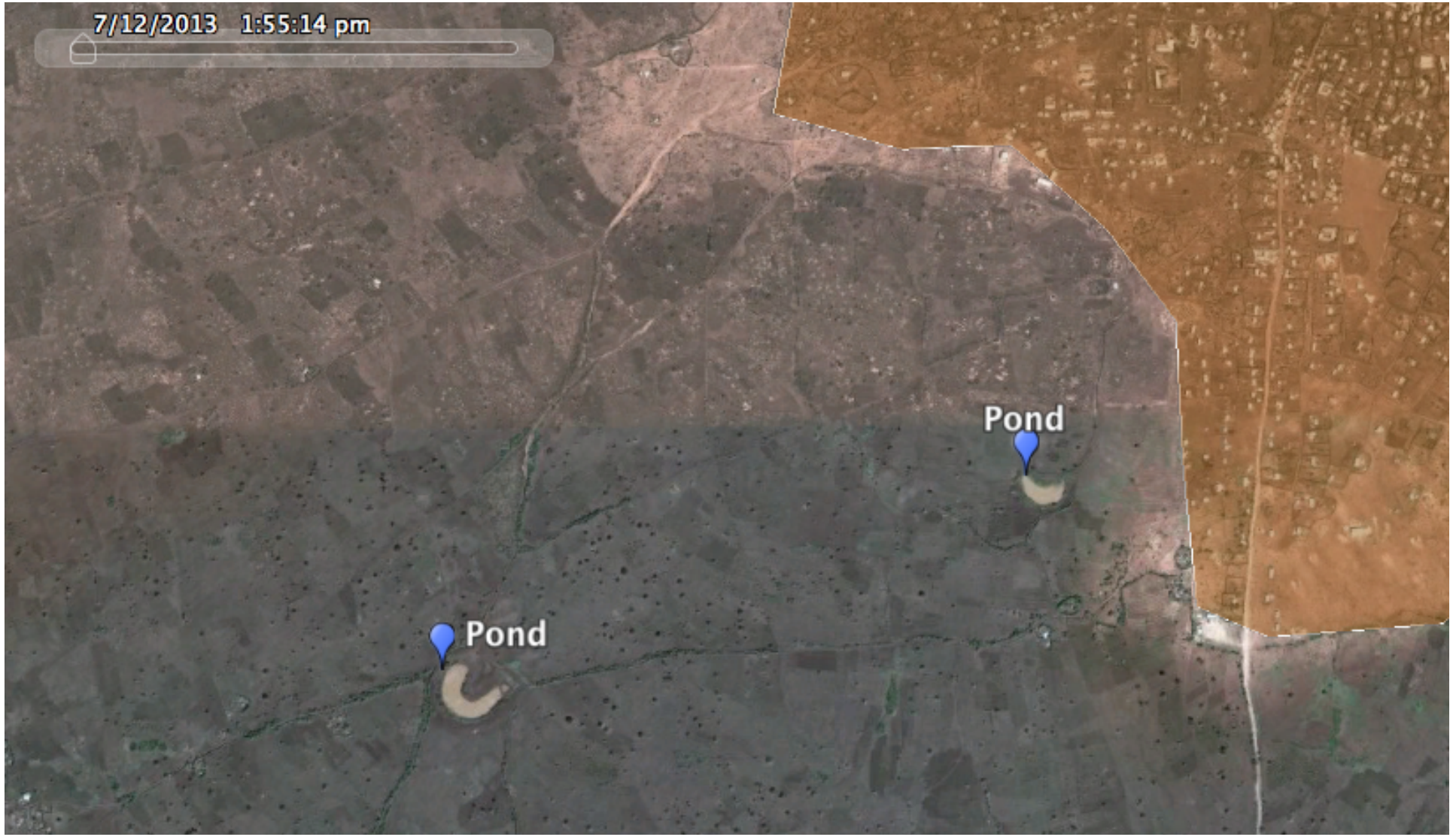
1. The Elevation profile will appear in the lower portion of your screen
2. By moving the pointer over the elevation profile curve you will see vital information for each point of the cross section.


Google Earth Pro
Sign in
Bukade
N
A 109
© 2016 Google
Image © 2016 CNES / Astrium
238 m
Google earth
Tour Guide
2010
lat 0.547127° lon 34.015489° elev 1119 m eye alt 2.21 km

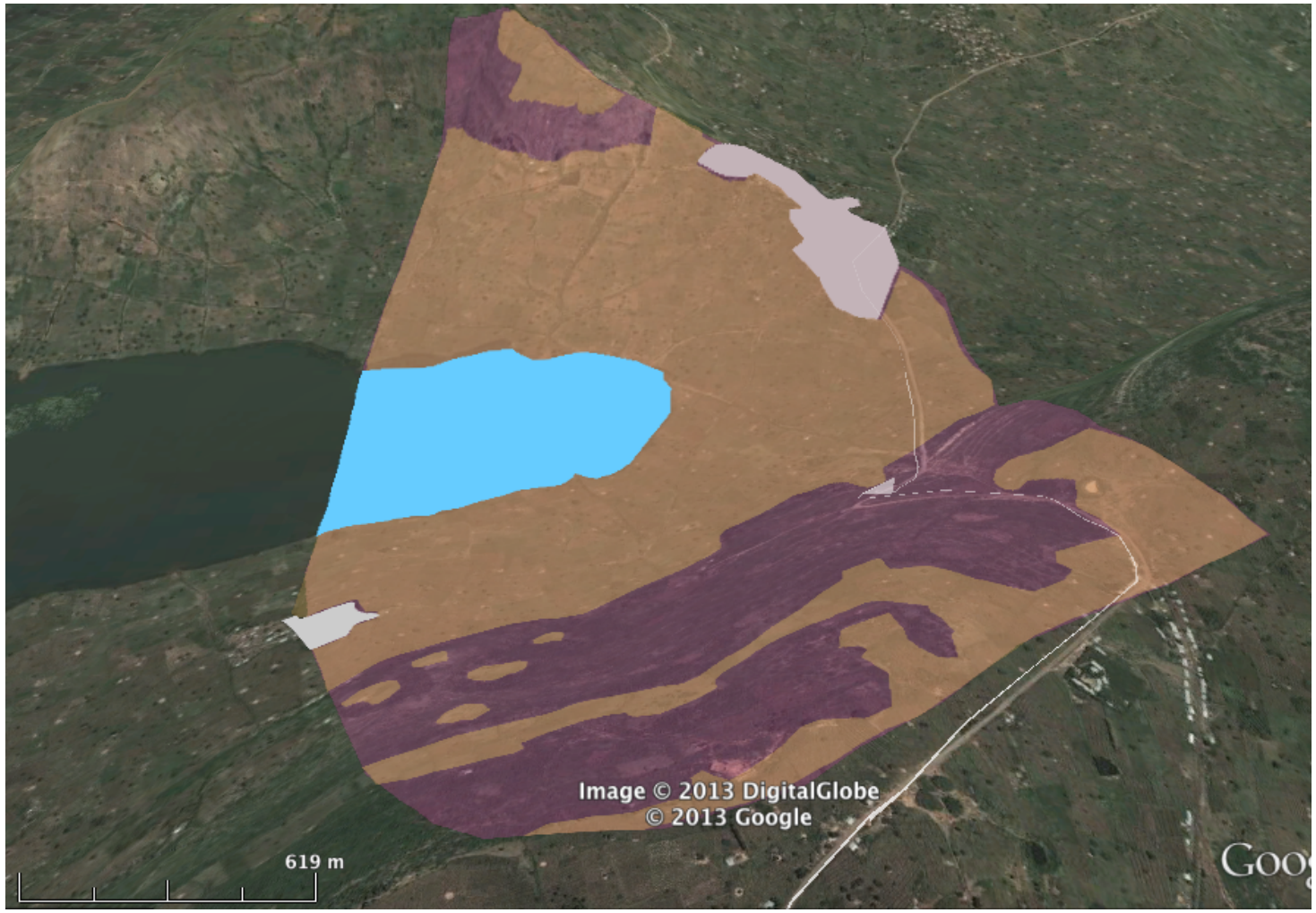
Google earth for planning

- Find existing ponds, rivers, etc
- Landuse mapping
- Define watersheds, boundaries of spate irrigation systems
- Find where the water drains – flooded areas
- Distance and areas
- Calculate number of households
- Elevation profiles

Identify features in the landscape

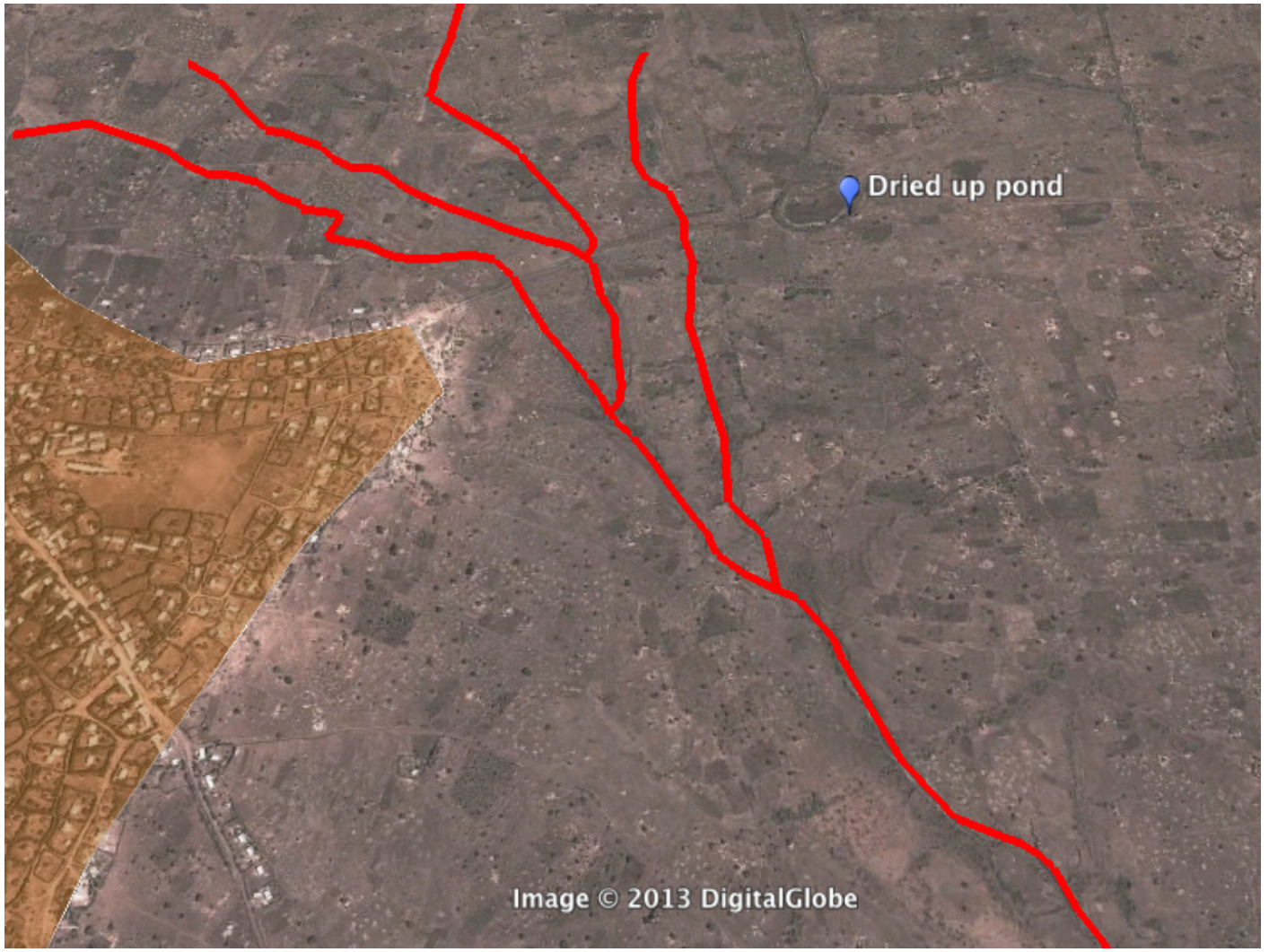


Landuse mapping

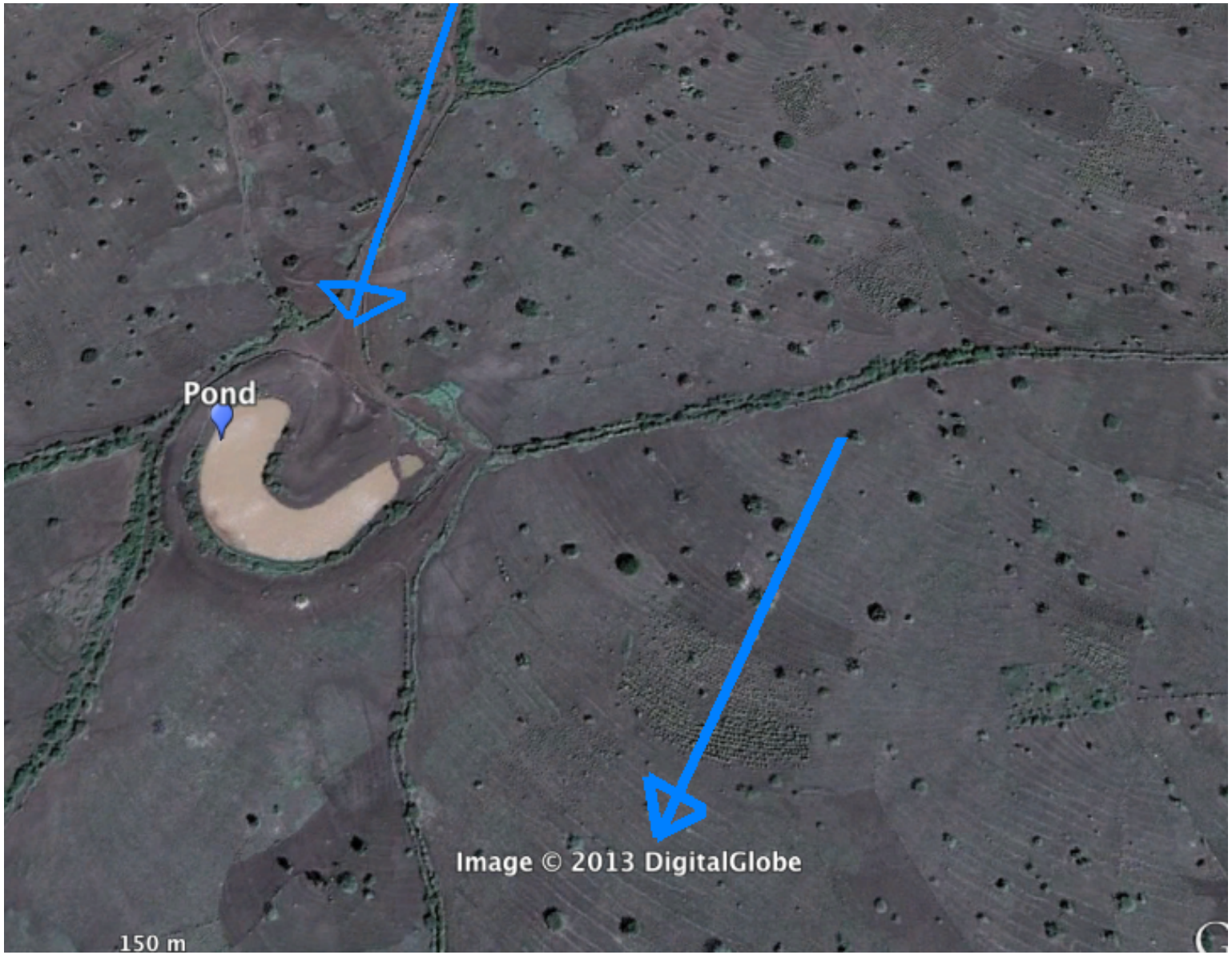


Define Watersheds

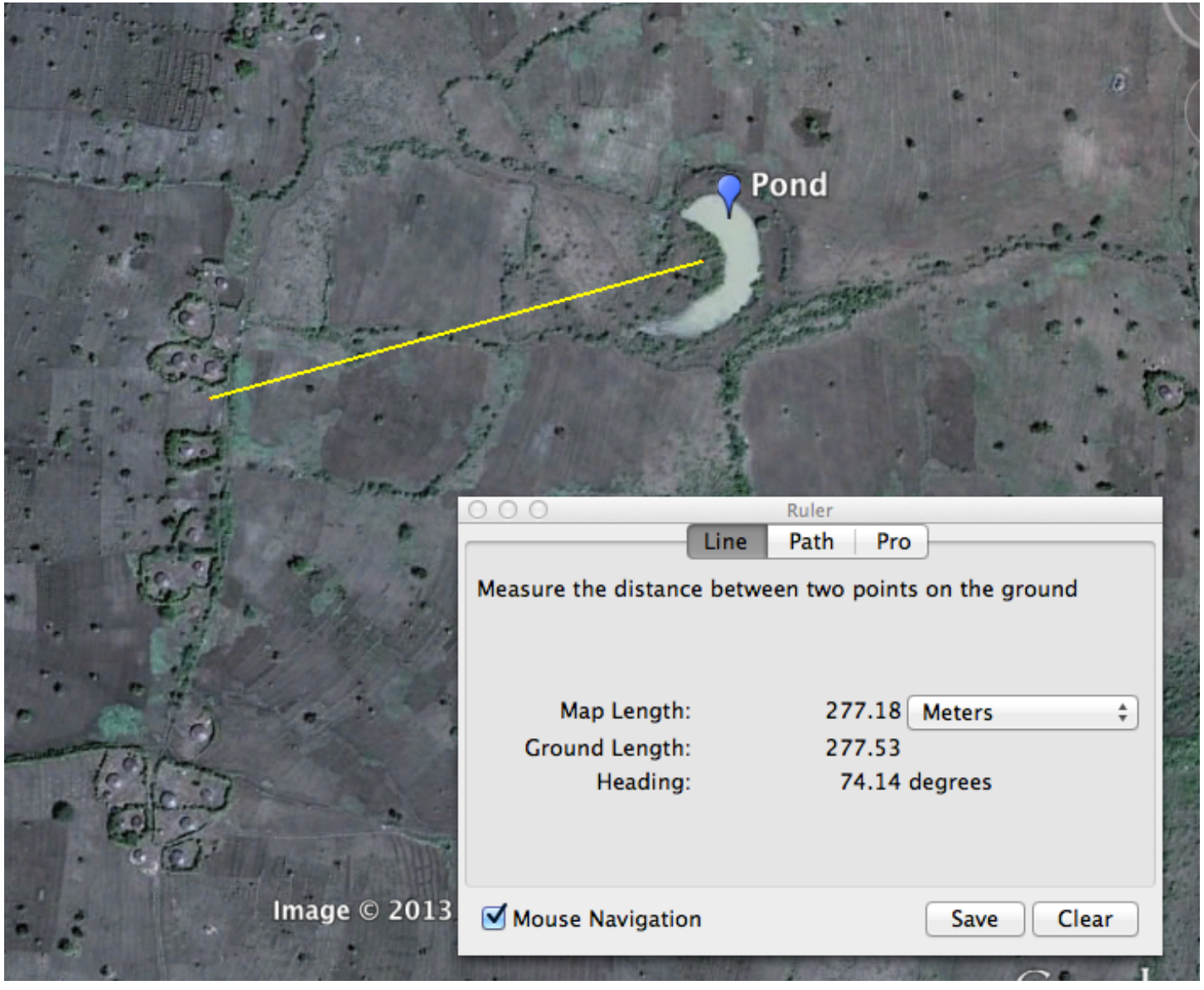
Find where the water flows



Find where the water flows

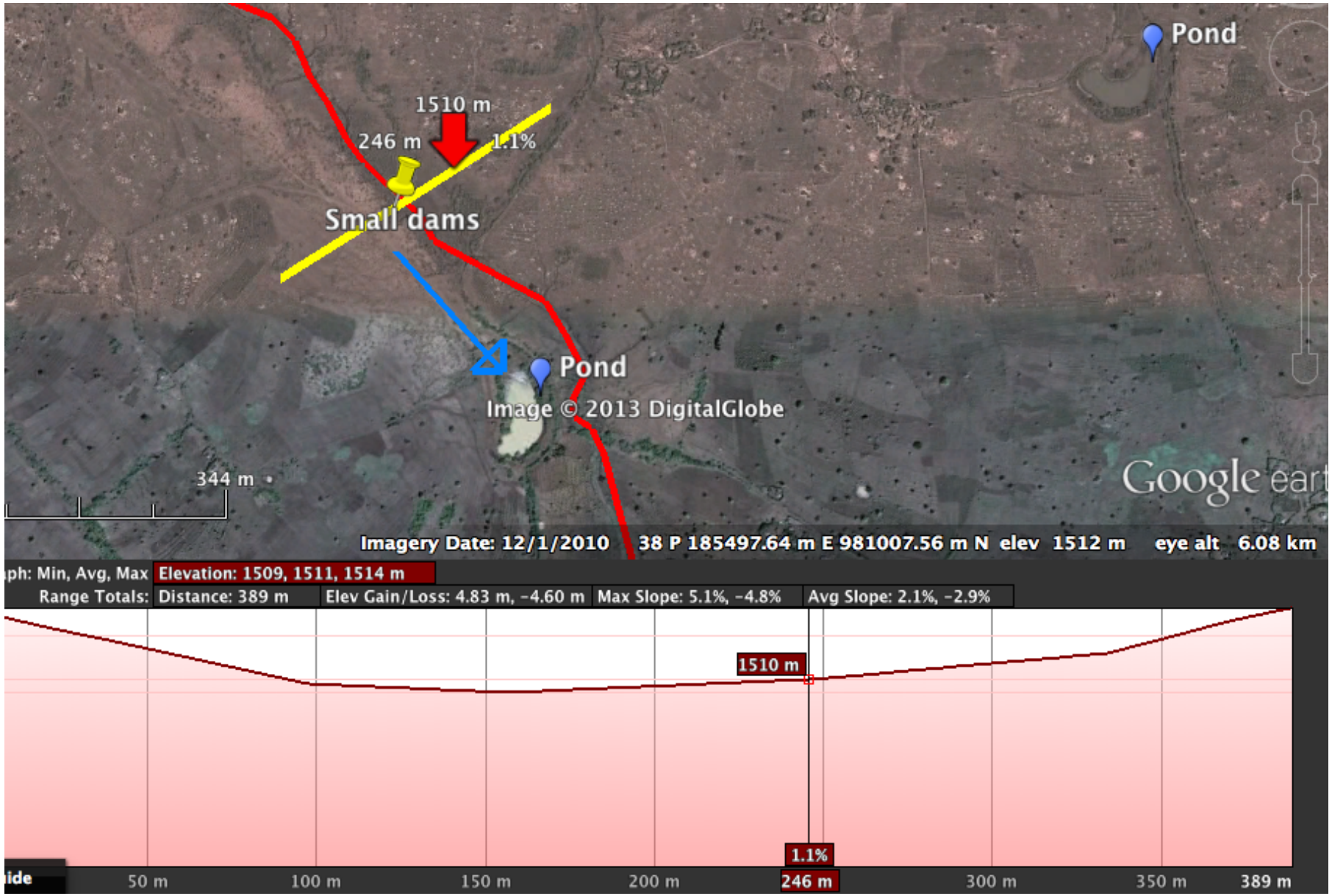


Measure distances



Counting Households

Elevation profiles



Is this soil salinity?

Exercise

- Delineate a flood based system you are familiar with **(draw polygon)**
- Mark diversion system **(point)**
- Mark distribution system **(line)**