



Moving Data. Simply.

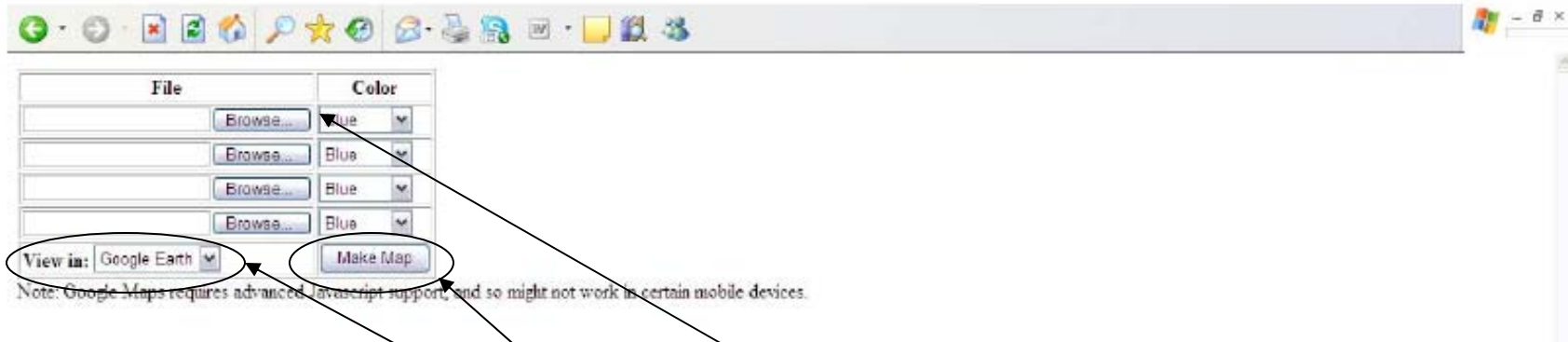
AptoGraph™ – City Drive Example



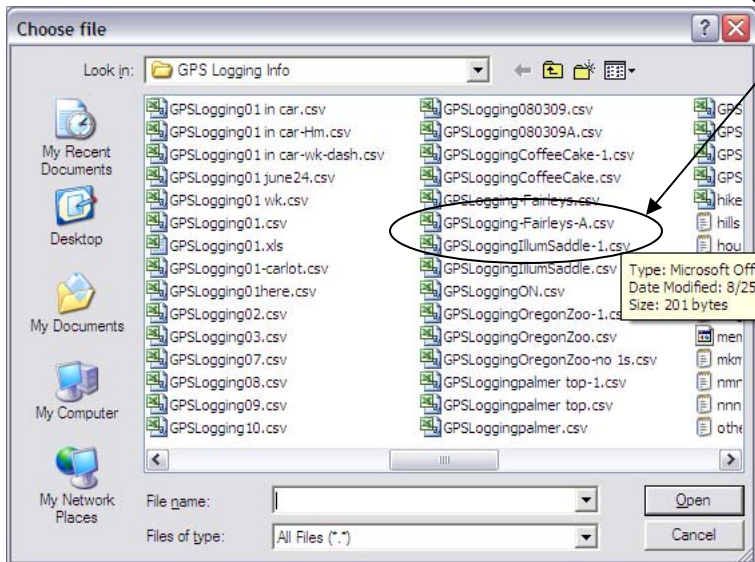
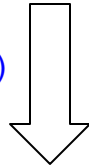
Moving Data. Simply.

About AptoGraph™

- AptoGraph is a web-based graphing tool that uses Google Maps and Google Earth as the back-drop to plot GPS data, thus providing a visual experience of the user's path traveled.
- AptoGraph enables users to upload up to four files in .TXT format or .CSV format and have the GPS data and adjoining "notes" plotted.
 - Examples of .TXT formatted data would be the NMEA data outputted (i.e. continuous or streaming data) while the user is:
 - Hiking
 - Riding a bike along a trail or on the road
 - Driving a route in the car or on a motorcycle, etc.
 - Example of .CSV formatted data would be point, or discrete, locations such as:
 - Store or restaurant within a city or community
 - Locations of animal exhibits at the zoo
 - Golf ball locations while playing golf on a golf course
 - Fishing or hunting spots
 - Landmarks
 - Field/crop marking, etc.
- Data can be collected in both formats by using AptoLink's DataTap SW, which runs on WinMobile OS v5 & v6, and Palm OS v4 & 5.
 - Other GPS devices on the market also provide this "data-logging" capability and their data can be graphed using AptoGraph if in the format mentioned above.

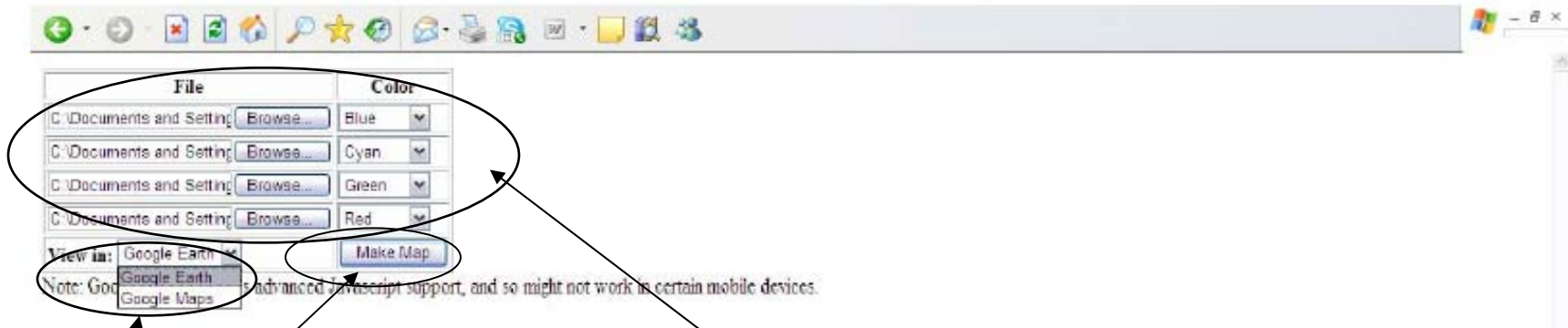


(screen opens up)



How to upload up to four files:

- Click on **Browse**
- Select one (and up to four) .TXT or .CSV files from a folder from your PC or laptop, tap on **Open**
- Select the **Color** type for the plotted data
- Select **Google Earth** or **Google Maps** output
- Tap on **Make Map**



1. Files and their colors have been chosen
2. User selects **Google Earth** or **Google Maps** for the data to be plotted against
3. Tap on **Make Map**

Google Maps

Download as KML2

Map | [Altitude #1 \(Blue\)](#) | [Altitude #2 \(Cyan\)](#) | [Altitude #3 \(Green\)](#) | [Altitude #4 \(Red\)](#) | [Overall Stats](#) | [Stats #1 \(Blue\)](#) | [Stats #2 \(Cyan\)](#) | [Stats #3 \(Green\)](#) | [Stats #4 \(Red\)](#)

Statistics of Data

<p>Start Time Aug 12, 2009 5:23:37 PM UTC</p> <p>End Time Aug 25, 2009 11:12:14 PM UTC</p> <p>Duration 13 days, 5 hrs, 48 mins, 37 secs</p> <p>Speed Min: 0.00 km/hr Max: 47.86 km/hr Avg: 29.24 km/hr</p> <p>Min: 0.00 mph Max: 29.91 mph Avg: 18.17 mph</p> <p>Total Distance 3.02 kilometers 1.89 miles <i>Don't use 0-speed data</i></p>	<p>Start Location Longitude: 122.58894 W Latitude: 45.54206 N Altitude: 82.70000 meters</p> <p>End Location Longitude: 122.5885 W Latitude: 45.54857 N Altitude: 70.89953 meters</p> <p>Altitude Min: 61.1 meters Max: 90.3 meters Avg: 78.3 meters</p> <p>Min: 200.5 feet Max: 296.3 feet Avg: 256.9 feet</p>
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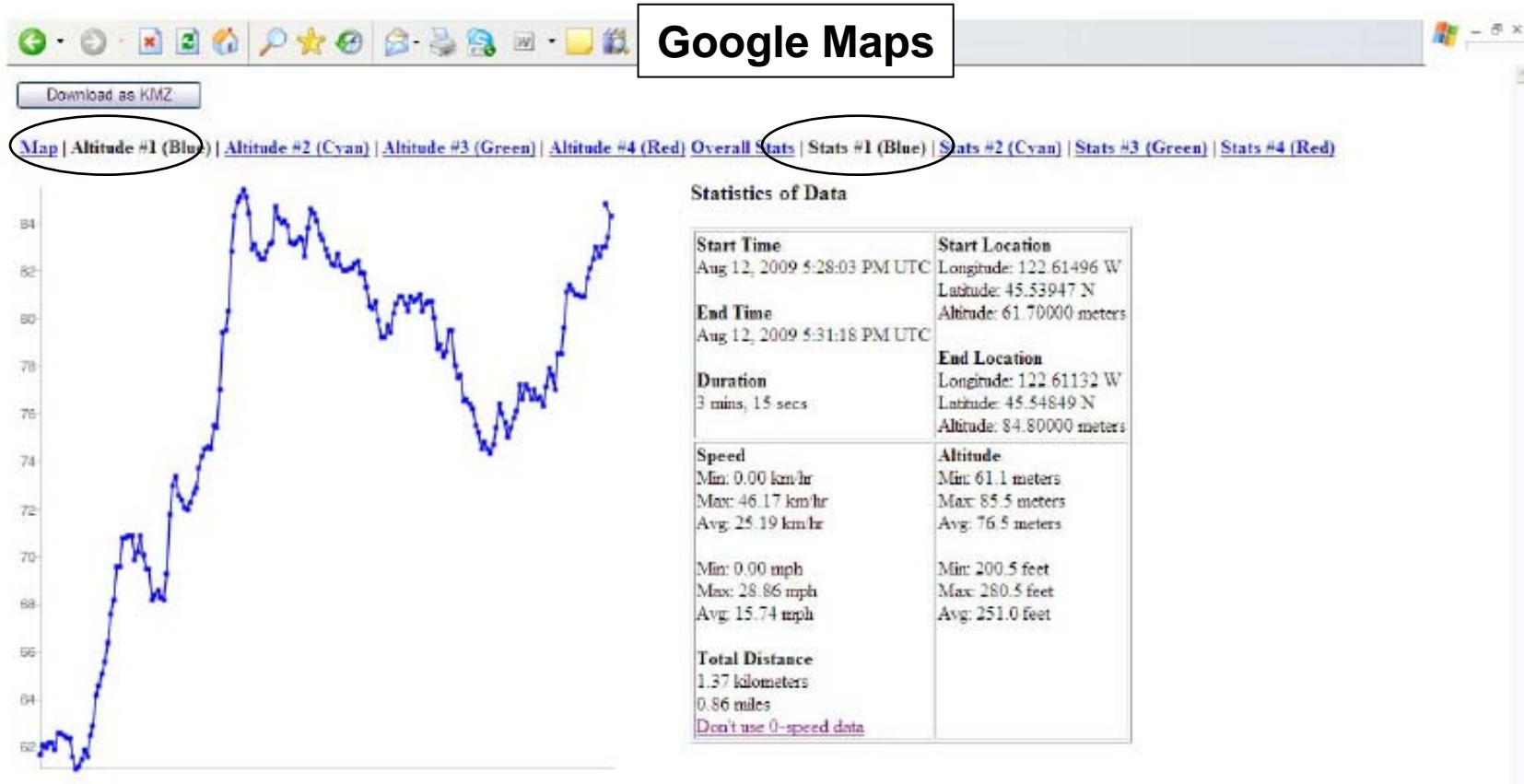
NOTE

Statistics of **Overall Stats**, for all four files is provided. Because this was three trips, the combination of these statistics doesn't make sense.

**** [Stats](#) and [Altitude](#) graph**, for each separate file is provided

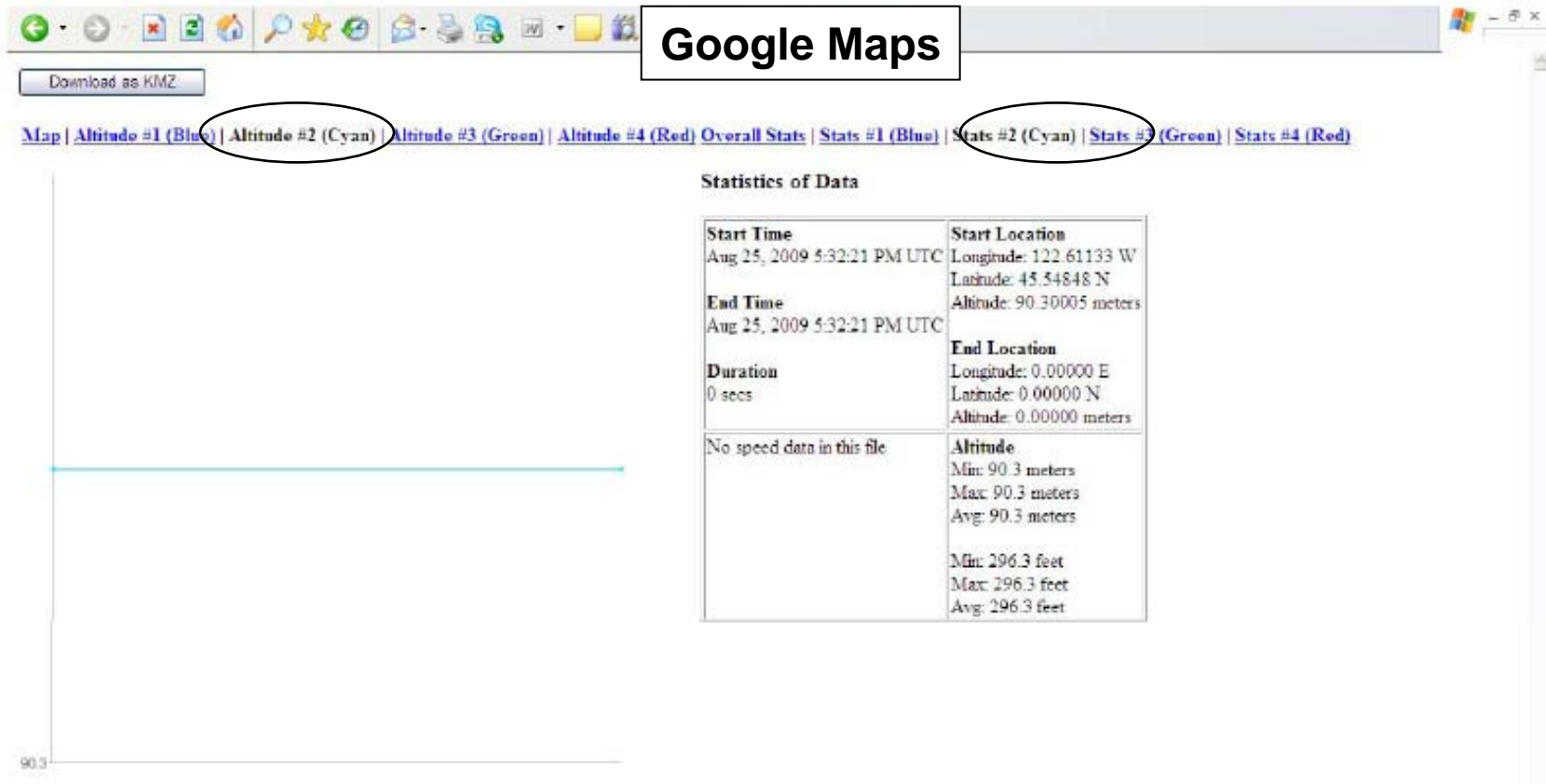
Summary of Graphed Data

- Four file are plotted in Google Maps (for this example)
 - Two .TXT files and two .CSV files
- Blue line is .TXT representing continuous datalog along 48th St in Portland, OR
 - End of blue line is .CSV file of discrete (or point) datalog of Café (50th and Fremont)
- Green line is .TXT representing continuous datalog along Sacramento St to a bike shop on 53rd and Sandy Blvd
- Solo point (i.e. a .CSV file) with the name "Roseway" beneath it, is a located upper right



Summary of Graphed Data – Blue line – route taken on 48th St

- Tap on Altitude #1 (Blue) and Stats #1 (Blue)
- Altitude, or elevation, change with respect to time (horizontal axis) is displayed and is based on the GPS data collected in the .TXT file.
- Statistics of the trip are provided to the right of the plot. Information is given in English units (i.e. miles / mph / feet, secs) as well as European units (i.e. kilometers / km/hr / meters, secs)



Summary of Graphed Data – Cyan dot (not clearly visible until user zooms in)

- Tap on Altitude #2 (Cyan) and Stats #2 (Cyan)
- Altitude, or elevation, change with respect to time (horizontal axis) is displayed and is based on a single point .CSV file. Since there wasn't an altitude change a horizontal line is plotted. One point was taken and logged into the .CSV file, which is shown by the **Duration** – 0 secs.
- Statistics and information of the point location are provided.

NOTE: Information is given in English units (i.e. miles / mph / feet, secs) as well as European units (i.e. kilometers / km/hr / meters, secs)

Google Maps

AptoGraph - Microsoft Internet Explorer

Address: http://www.wingedcat.com/cgi-bin/apto-graph_wic.cgi

Download as KMZ

Map | [Altitude #1 \(Blue\)](#) | [Altitude #2 \(Cyan\)](#) | [Altitude #3 \(Green\)](#) | [Altitude #4 \(Red\)](#) | Overall Stats | [Stats #1 \(Blue\)](#) | [Stats #2 \(Cyan\)](#) | [Stats #3 \(Green\)](#) | [Stats #4 \(Red\)](#)

Statistics of Data

Start Time Aug 12, 2009 5:23:37 PM UTC	Start Location Longitude: 122.58894 W Latitude: 45.54206 N Altitude: 82.70000 meters
End Time Aug 25, 2009 11:12:14 PM UTC	End Location Longitude: 122.5885 W Latitude: 45.54857 N Altitude: 70.89953 meters
Duration 13 days, 5 hrs, 48 mins, 37 secs	
Speed Min: 0.00 km/hr Max: 47.86 km/hr Avg: 29.24 km/hr	Altitude Min: 61.1 meters Max: 90.3 meters Avg: 78.3 meters
Min: 0.00 mph Max: 29.91 mph Avg: 18.27 mph	Min: 200.5 feet Max: 296.3 feet Avg: 256.9 feet
Total Distance 3.02 kilometers 1.89 miles	
Don't use 0-speed data	

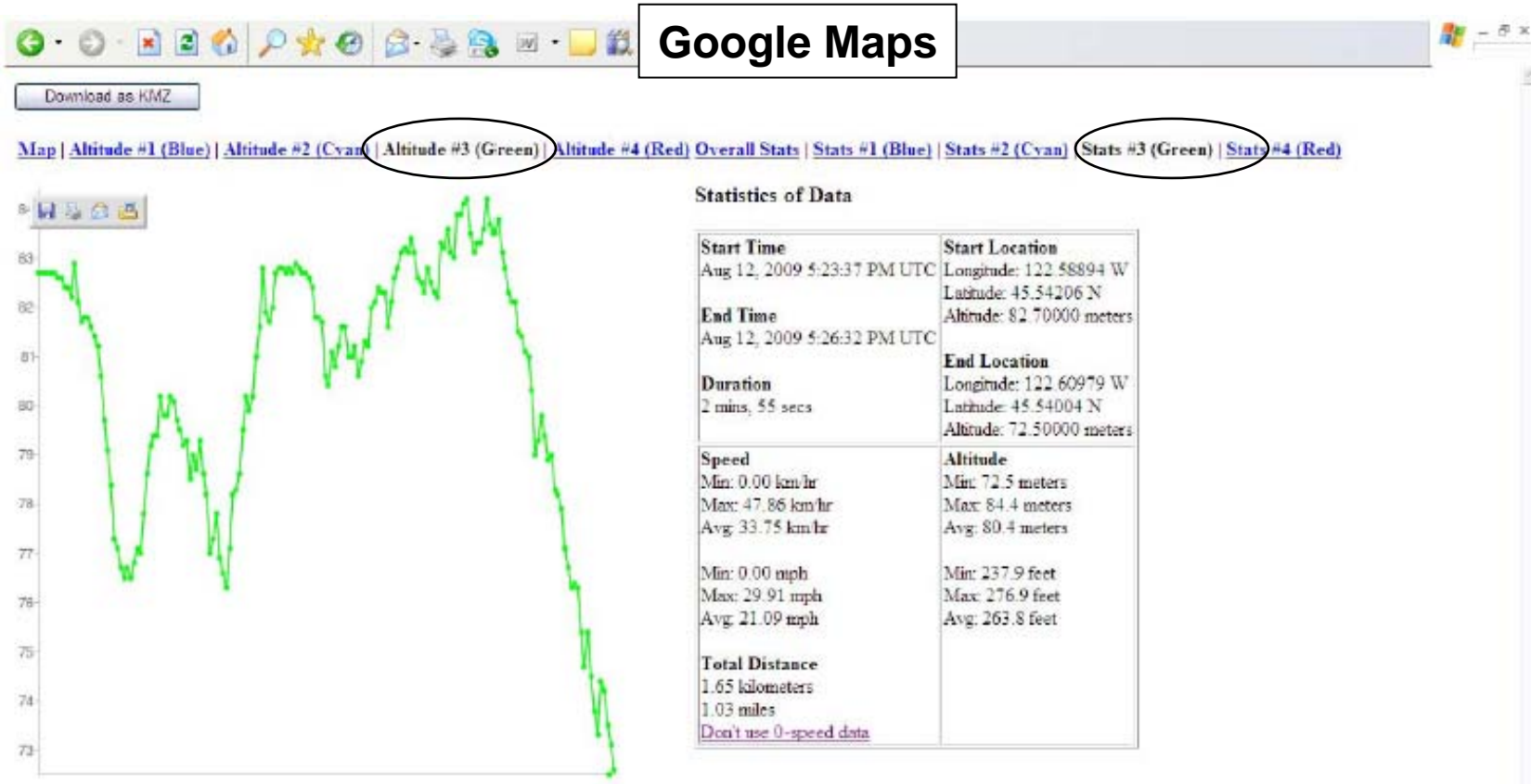
Summary of Graphed Data – Cyan dot

- The user can use the “+” and “-” features on the left to “zoom in” and “zoom out”
- In this example, the user “zoomed in” to get a better view of the cross streets
- Clicking on the blue inverted teardrop displays saved information under **Notes** in the .CSV file. In this example, **coffeecake** was inputted when the user saved the GPS data.

.CSV File Format Explained

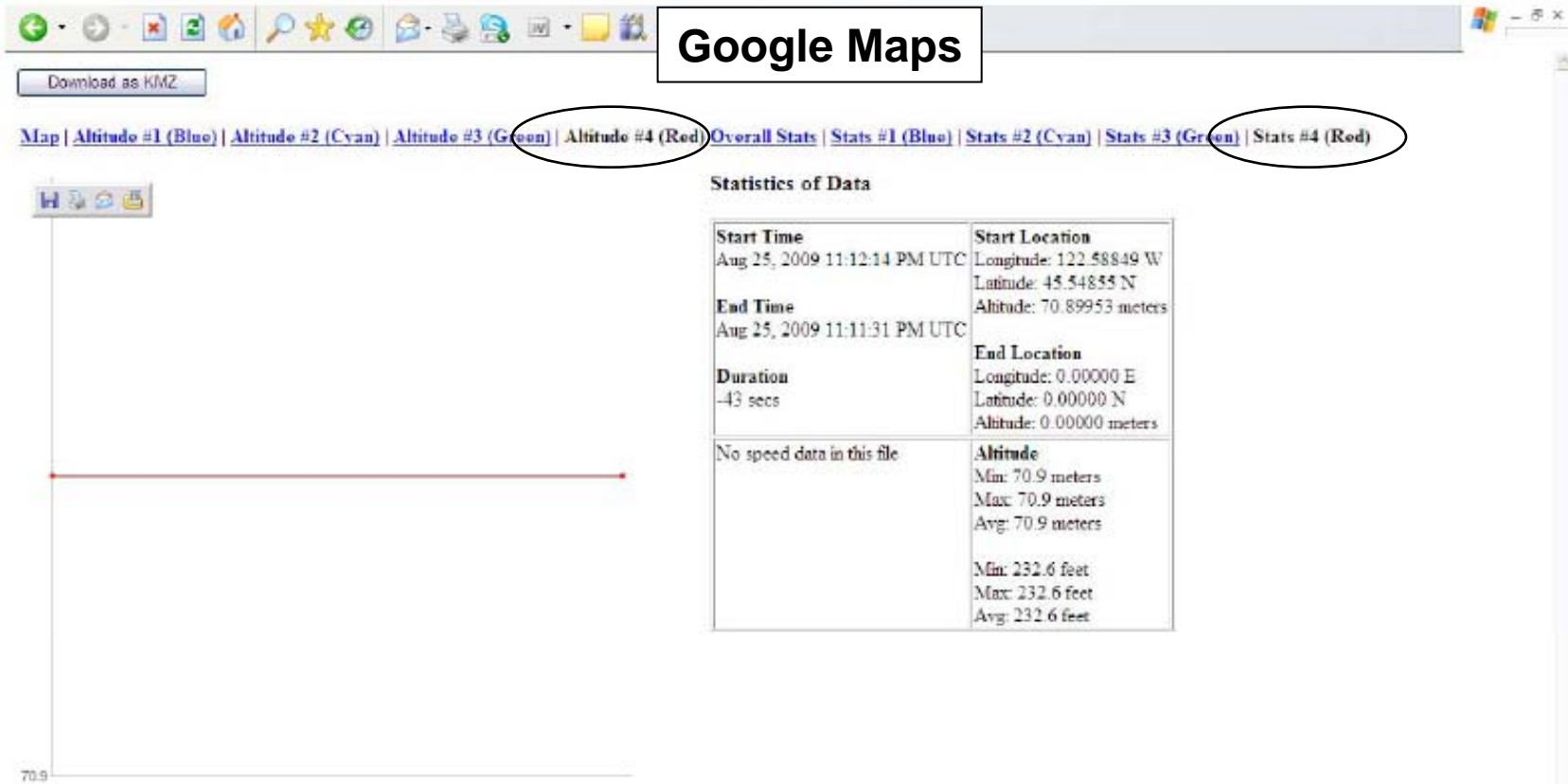
RecordNo	Latitude	Longitude	Date	Time	Altitude	Notes	ES
1	45°32.9085' N	122°36.6799' W	8/12/2009	17:32.21.000	296.26 ft	coffeecake	

- One record, or point, was saved in the .CSV file
- All GPS information defined for the file data-logging was also saved
- Under **Notes**, the name **coffeecake** was saved and was displayed exactly as saved in the file on the graph in Google Maps
- The column “ES” is used for separating each point when plotted. Google Maps will connect the dots (each point) when plotting the output. If the user places a “1” (the number one) in the selected cell, AptoGraph will not connect that point (with the “1” in its cell) to the next point on the next row.
 - A useful example is when the user is golfing, and wants to plot the golf ball locations for each tee only – Tee 1, Tee 2, etc. When graphed, the user can visually see each ball location and the dots/points are connected only for each tee.



Summary of Graphed Data – Green line – route traveled on Sacramento St

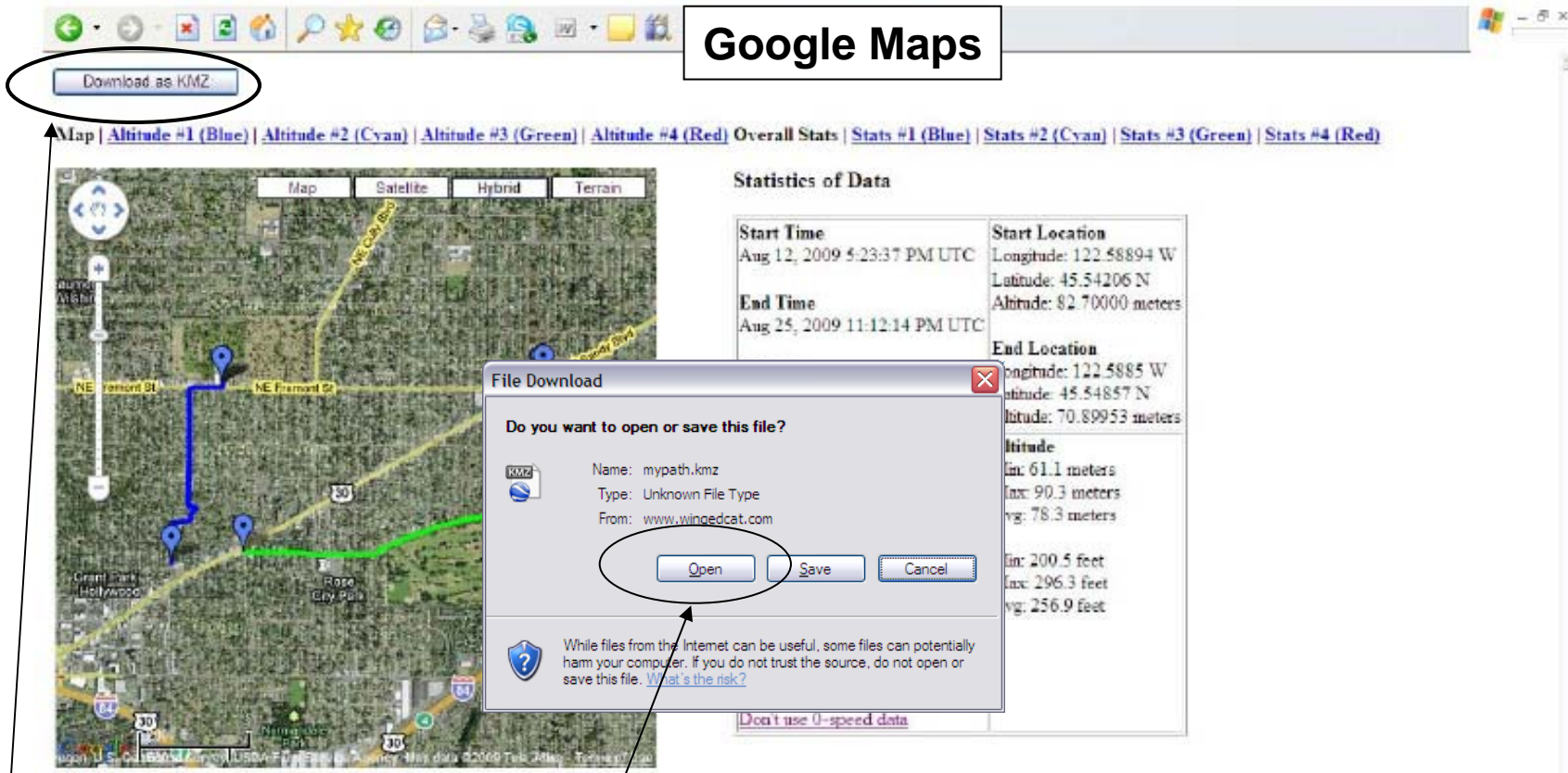
- Tap on Altitude #3 (Green) and Stats #3 (Green)
- Altitude, or elevation, change with respect to time (horizontal axis) is displayed and is based on the GPS data collected in the .TXT file.
- Statistics of the trip are provided to the right of the plot. Information is given in English units (i.e. miles / mph / feet, secs) as well as European units (i.e. kilometers / km/hr / meters, secs)



Summary of Graphed Data – Red dot (not clearly visible until user zooms in)

- Tap on Altitude #4 (Red) and Stats #4 (Red)
- Altitude, or elevation, change with respect to time (horizontal axis) is displayed and is based on multiple points in .CSV file. Since there wasn't an altitude change a horizontal line is plotted. More than one point was logged into the .CSV file, which is shown by the **Duration** – 43 secs – from the time the first point was logged to the time the last point was logged.
- Statistics and information of the point locations are provided.

NOTE: Information is given in English units (i.e. miles / mph / feet, secs) as well as European units (i.e. kilometers / km/hr / meters, secs)
www.AptoLink.com



Creating a Google Earth output (i.e. a KMZ file)

- Tap on **Download as KMZ** button (at the top left)
- **File Download** window will pop up
- To view it in [Google Earth](#), tap on **Open**
 - To save it and view at another time, or send it to someone else for viewing, tap on **Save**
 - Name the file with a descriptive name, e.g. **TripToPortland-0809**

NOTE: Make sure your PC/laptop can view KMZ files using Google Earth. If the user hasn't downloaded Google Earth file, go to: earth.google.com for the latest edition

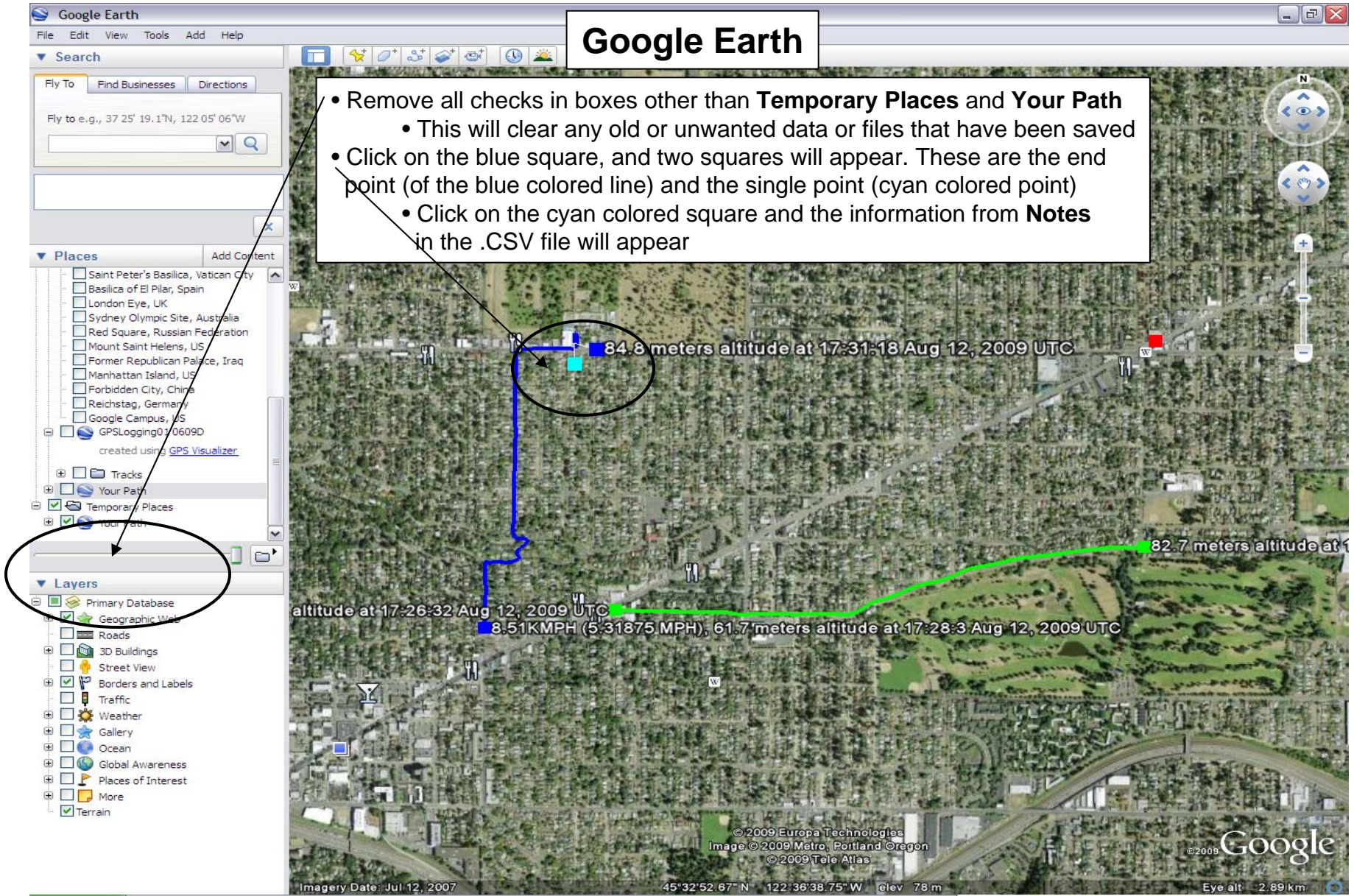
Google Earth

Google Earth Output – Example follows...

The screenshot displays the Google Earth interface with a path visualization. The path is shown in blue and green, with data points indicating speed and altitude. The path starts at a point labeled "altitude at 17:31:18 Aug 12, 2009 UTC" and ends at a point labeled "82.7 meters altitude at 17:28:3 Aug 12, 2009 UTC". A segment of the path is labeled "8.51KMPH (5.31875.MPH), 61.7 meters altitude at 17:28:3 Aug 12, 2009 UTC". The interface includes a search bar, a places list, and a layers panel. The bottom of the window shows the imagery date as Jul 12, 2007, and coordinates: 45°32'54.01" N, 122°36'00.85" W, elev 77 m, Eye alt 2.89 km.

Google Earth

- Remove all checks in boxes other than **Temporary Places** and **Your Path**
 - This will clear any old or unwanted data or files that have been saved
- Click on the blue square, and two squares will appear. These are the end point (of the blue colored line) and the single point (cyan colored point)
 - Click on the cyan colored square and the information from **Notes** in the .CSV file will appear



Google Earth
Google Earth

Search

Fly To Find Businesses Directions

Fly to e.g., 37 25' 19.1"N, 122 05' 06"W

Places Add Content

- Saint Peter's Basilica, Vatican City
- Basilica of El Pilar, Spain
- London Eye, UK
- Sydney Olympic Site, Australia
- Red Square, Russian Federation
- Mount Saint Helens, US
- Former Republican Palace, Iraq
- Manhattan Island, US
- Forbidden City, China
- Reichstag, Germany
- Google Campus, US
- GPSLogging01 0609D
created using [GPS Visualizer](#)

Tracks

Your Path

Temporary Places

Your Path

Layers

- Primary Database
- Geographic Web
- Roads
- 3D Buildings
- Street View
- Borders and Labels
- Traffic
- Weather
- Gallery
- Ocean
- Global Awareness
- Places of Interest
- More
- Terrain

Information displayed:

- What was save in **Notes** cell - coffeecake
- Altitude – 90.3 meters
- UTC time and date that the data was saved

coffeecake - 90.3 meters
altitude at 17:32:21 Aug 25,
2009 UTC
Directions: [To here](#) - [From here](#)

84.8 meters altitude at 17:31:18 Aug 12, 2009 UTC

82.7 meters altitude at 17:28:3 Aug 12, 2009 UTC

altitude at 17:26:32 Aug 12, 2009 UTC

8.51KMPH (5.31875.MPH), 61.7 meters altitude at 17:28:3 Aug 12, 2009 UTC

Imagery Date: Jul 12, 2007 45°32'54.21" N 122°36'40.80" W elev 78 m Eye alt 2.89 km