

HIRAD GOOGLE EARTH KMZ GUIDE

There are two types of .kmz files that are distributed with the HIRAD GRIP data:

1) FLIGHT TRACK

The .kmz file containing HIRAD flight track is named as

`grip_flighttrack_YYYYMMDD_YYYYMMDD_earl_extrude.kmz`

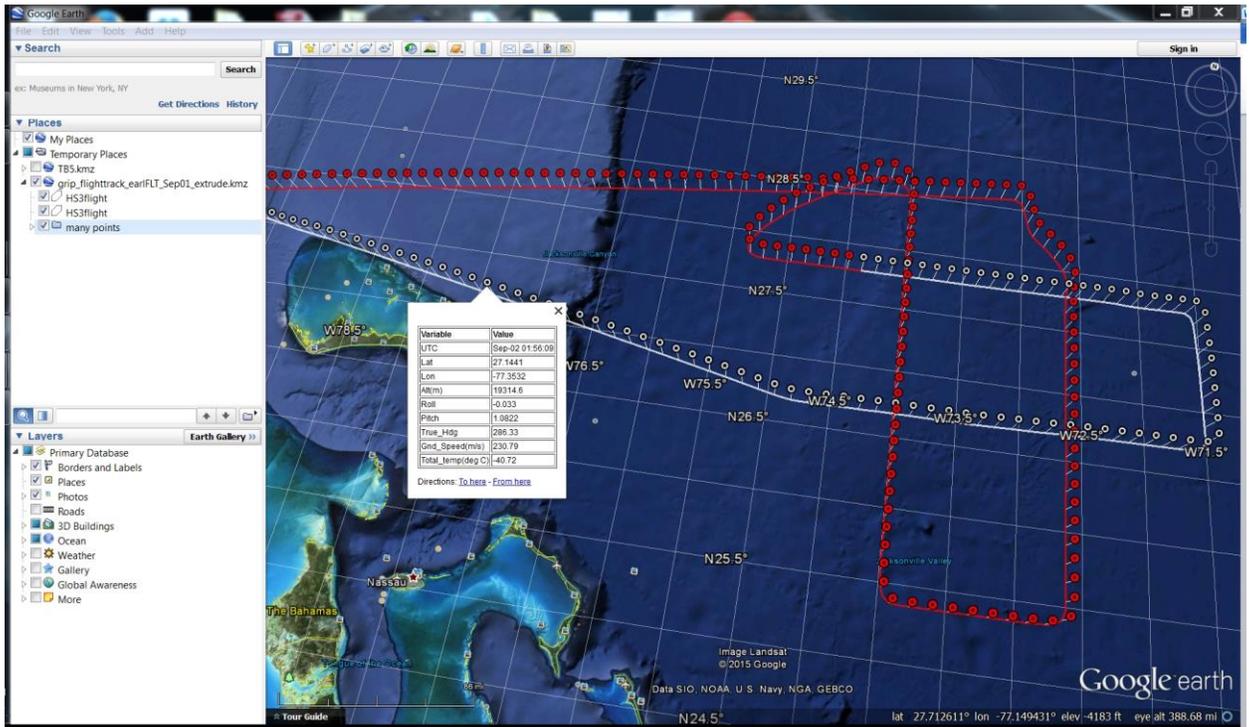


Figure 1: HIRAD flight track for September 01-02, 2010 hurricane EARL over flight.

In Figure 1 the “grip_flighttrack_20100901_20100902_earl_extrude.kmz” is displayed on the google earth viewer. The red and the white color distinguish between outgoing (towards the storm) and incoming (towards land) flight sections. The color changes midway between the flight duration. A data point is plotted at the aircraft altitude (with a local vertical line connecting it to the ground track) for every 1 minute. Clicking on these points one can obtain aircraft attitude, speed, air temperature information in a tabular form as shown in the Figure 1 image. The following variables are included in the table:

Table 1: Flight Track Data Variables

Variable	Unit
UTC Time (UTC)	MMM-DD HH:MM:SS
Latitude (Lat)	degrees
Longitude (Lon)	degrees
Aircraft Altitude (Alt)	meters
Aircraft Roll Angle (Roll)	degrees
Aircraft Pitch Angle (Pitch)	degrees
Aircraft true Heading (True_Hdg)	degrees (clockwise from north)
Aircraft Ground Speed (Grnd_Speed)	meters per second
Ambient Total Temperature (Total_temp)	degree Centigrade

2) **BRIGHTNESS TEMPERATURE IMAGES (TB)**

For each of the HIRAD flight four $TB_N.kmz$ and four $TB_{Nex}.kmz$ files are provided. Where, $N = 4, 5, 6$ and 7 corresponds to 4GHz , 5GHz, 6GHz and 6.6GHz measurement frequencies.

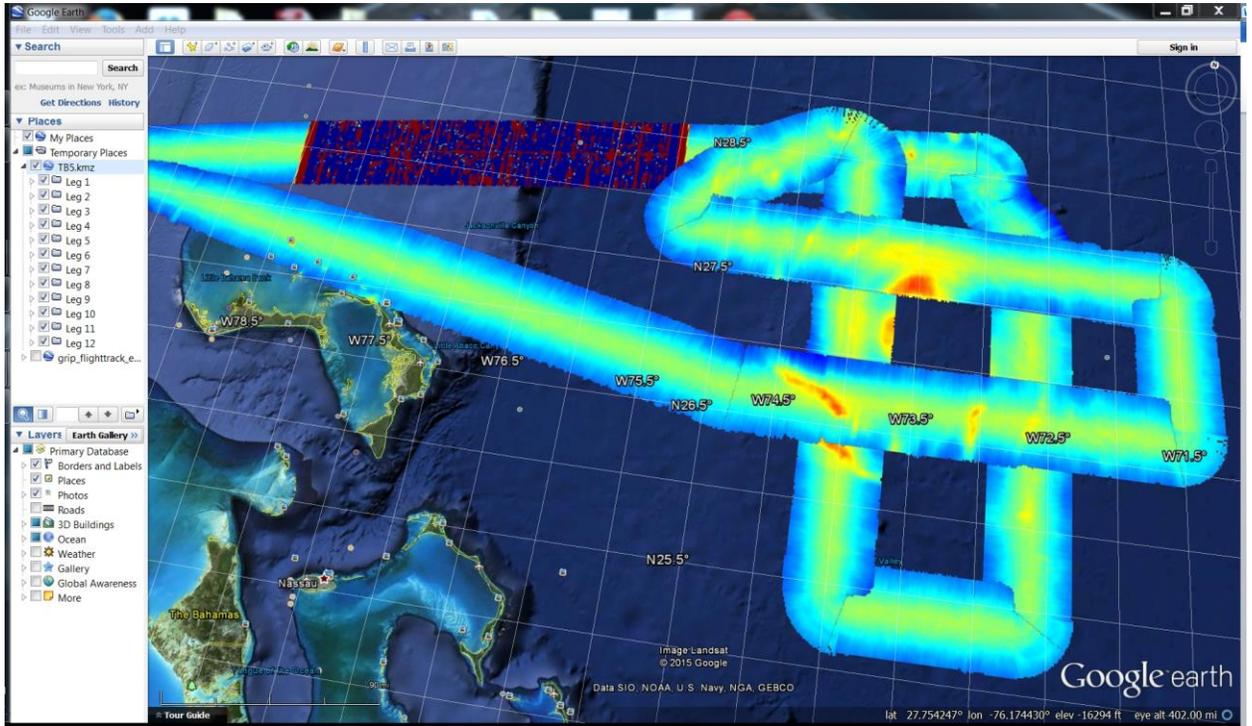


Figure 2: Image of $TB5.kmz$ for September 01-02, 2010 hurricane EARL over flight

The $TB^*.kmz$ files are HIRAD measured brightness temperature (T_b) images and $TB^*ex.kmz$ files are “Excess Brightness Temperature” images created by subtracting the modelled ocean surface brightness at zero windspeed from the observed HIRAD T_b . Each of the $.kmz$ file contain images for the entire duration of the flight. However, to resolve images for overlapping swath regions etc. the flies are sub-divided into smaller

sections or legs. Figure 2 shows the 5 GHz HIRAD Tb image for the September 01-02, 2010 hurricane Earl over flight. On the left panel of google earth browser window it can be seen that the TB5.kmz file is divided into 12 legs. Any combination of these legs can be plotted. For example in Figure 3, only the leg 5 is plotted.

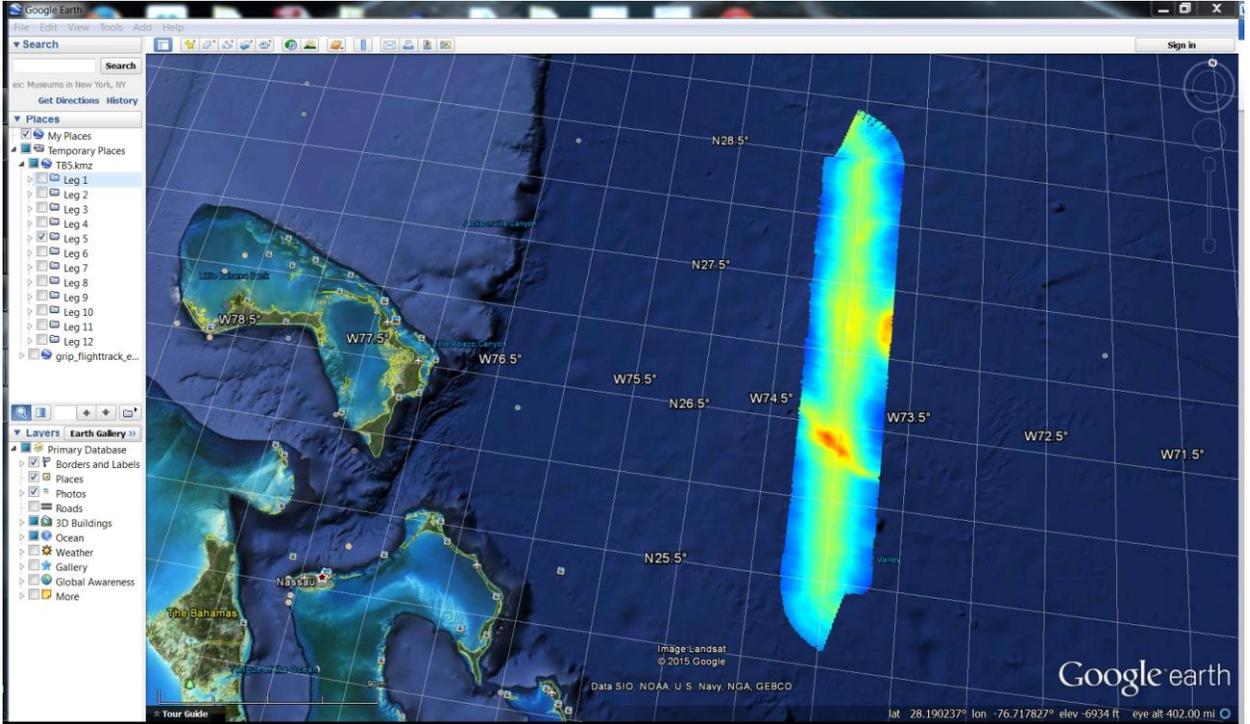
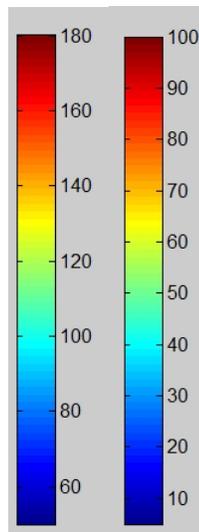


Figure 3: Only leg 5 is selected from the “TB5.kmz” for September 01-02, 2010 hurricane Earl flight



(a) (b)

Figure 4: (a) Color scale used for TB*.kmz files, (b) Color scale used for TB*.ex.kmz files

Two different colorbar color scale are used for the Tb images and the Excess Tb images in the .kmz files. For the Tb images the chosen color axis is (50, 180) and for the excess Tb images it is (5,100). Figure 4 shows the colorbars.