AOSC 652: Analysis Methods in AOSC — Assignment #2

Due: Monday, 12 September 2016 (at start of class)

Late penalty: 10 pts per day

Name: _____

1. (50 points). This assignment is an exercise in the development of a simple FORTAN code to calculate a quantity of geophysical interest and the interface of this quantity to Google Earth.

A satellite instrument is about to launch. It will measure atmospheric composition at specific geophysical locations (i.e., it can point to a precise spot on the ground).

You must provide the coordinates (latitude & longitude) of three "target locations", to which the satellite will point. The satellite has a pointing accuracy of 0.2 kilometer. However, the coordinates for latitude and longitude have to be supplied in radians, rather than degrees (the satellite is being run by engineers, not scientists!).

First, use the program Google Earth to help locate three ground target locations. This can be your childhood home, your school, the place you presently live, etc.

Obtain a hard copy (print out, color preferred) of each location. Circle (or otherwise indicate) the precise spot for targeting. Write the latitude and longitude of the target spot on the print out.

Then, write a program, in FORTRAN, that converts latitude and longitude from degrees to radians.

Please enter the coordinates of the three target spots, as well as a brief description of what is being targeted, below:

Target Description	Latitude (radians)	Longitude (radians)
1.		
2.		
3.		

Use the appropriate number of significant digits that are necessary to hit the target spot, given the 0.2 km pointing accuracy of the satellite instrument.

Turn in this sheet, print outs of the three target locations (with latitude, longitude in degrees written, by hand, on each page), the FORTRAN code used to convert degrees to radians, **as well as a brief description of how you arrived at the appropriate number of significant digits**. Please print the FORTRAN code using enscript and use (or somehow indicate) the full path name.

> Wondering where this exercise came from? R. Salawitch had to specify the precise location of 17 ground Fourier Transform Spectrometer Stations, at various locations around the world, to the engineers running the NASA Orbiting Carbon Observatory instrument. To complete this task, Google Earth was used extensively and a FORTRAN code was written to convert degrees to radians.