**Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Group Project#8**

**Computer Applications in Meteorology Due: Fri. Mar. 27, 2020**

**Google Earth and HYSPLIT**

1. Driver Initials:\_\_\_\_\_\_\_\_ Passenger Initials:\_\_\_\_\_\_\_\_
* Use Google Earth to do the following related to the locations; Asheville airport (AVL, lat=35.4361oN, lon=82.5417oW) and Poga Mountain, NC (Avery County, lat=36.2526 oN, lon=81.9136 oW)
	+ Place “push pins” marking the AVL and Poga Mtn locations
	+ Write down the elevation at AVL \_\_\_\_\_\_\_\_\_\_\_\_ feet
	+ Write down the elevation at Poga Mountain \_\_\_\_\_\_\_\_\_\_\_\_ feet
	+ Write down the straight-line (“as the crow flies”) distance (in meters) between AVL and Poga Mtn \_\_\_\_\_\_\_\_\_\_\_\_
	+ Save the Google Earth map as a ‘jpeg” image
1. Driver Initials:\_\_\_\_\_\_\_\_ Passenger Initials:\_\_\_\_\_\_\_\_
* Go to the HYSPLIT web page <https://www.ready.noaa.gov/HYSPLIT.php>
* Click “Run HYSPLIT Trajectory Model” link
* On the next page, click “Compute archive trajectories” link
* Select “1” as the “Number of Trajectory Starting Locations” and “Normal” as the “Type of Trajectory”, then click the “Next>>” button
* Under the “Meteorology:” input section on the next web page, select “REANALYSIS (global, 1948-present)”
* Under the “Source Location” input section [on the same page], select “Decimal Degrees Latitude” and enter the latitude and longitude of AVL provided in Part (a) of this project, then click the “Next>>” button
* On the next web page (“Meteorology File”) select the “.gbl” file that corresponds to the year and month of your birthday, then click the “Next>>” button
* On the next web page (“Model Run Details”), select “Backward” option under “Trajectory direction:”, “Model vertical velocity” option under “Vertical Motion:”, and the year, month, and day of your birthday and “12” under hour (for 1200 UTC) via the “Start time (UTC)”: selection windows
	+ Enter “72” under “Total run time (hours):”
	+ Enter “500” under “Level 1 height:”, “1500” under “Level 2 height:”, and “3000” under “Level 3 height”, verifying that “meters AGL” has been selected to the right of these input boxes
	+ Leave all other default selections and click the “Request trajectory (only press once!)” button
* Wait for the “GIF” plot trajectory production step to reach completion
* Click the “.gif” active link to get the air parcel trajectory plot
* Right click on the “.gif” image to save it to your computer (with a unique filename) and click on the “Trajectory endpoints file.” link to create a text file containing the latitude, longitude, above ground level (AGL, meters), and pressure level [hPa] and save it as a text file to your computer
* Write below the locations [lat., lon., height (AGL)] of the three air parcels 72 hours (3 days) before your birthday that arrived at AVL at 1200 UTC on the day of your birthday at
	+ 500 m AGL\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, 1500 m AGL\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and 3000 m AGL\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Names: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Group Project#9**

**Computer Applications in Meteorology Due: Fri. Mar. 27, 2020**

**Google Earth and HYSPLIT (continued)**

1. Driver Initials:\_\_\_\_\_\_\_\_ Passenger Initials:\_\_\_\_\_\_\_\_
* Repeat using HYSPLIT, except you’ll be exploring backward trajectories at AVL for TWO different times associated with the northwest flow snowfall event explored in the first day activities (0000 UTC 5 December and 1200 UTC 6 December 2010). All HYSPLIT settings will be identical to the selections in Part (b), with the exception of…
	+ Use “NARR 32km (N.A., 1979-present)” as the “Meteorology:” selection on “Meteorology & Starting Location(s)” page
	+ Select the appropriate “NARR\*” file with the correct year and month for the northwest flow snowfall event described above
	+ Input the appropriate “year”, “month”, “day”, and “hour” under the “Start time (UTC)”: selection windows
	+ And the backward trajectory “Total run time (hours):” will be 24-h {rather than 72-h of Part (b)}
* Right click on the “.gif” images at both times to save it to your computer (with a unique filename) and click on the “Trajectory endpoints file.” link to create a text file containing the latitude, longitude, above ground level (AGL, meters), and pressure level [hPa] at both times and save it as a text file to your computer
* Write below the locations [lat., lon., height (AGL)] of the three air parcels 24-h before arriving at AVL at 0000 UTC 5 December 2010
	+ 500 m AGL\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, 1500 m AGL\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and 3000 m AGL\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Write below the locations [lat., lon., height (AGL)] of the three air parcels 24-h before arriving at AVL at 1200 UTC 6 December 2010
	+ 500 m AGL\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, 1500 m AGL\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and 3000 m AGL\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* From a meteorological perspective [<https://www2.mmm.ucar.edu/imagearchive/> ], why is the 3000 m AGL trajectory so different between 0000 UTC 5 December and 1200 UTC 6 December 2010? [write/ type your hypothesis in the space below]
* If interested, you can experiment with saving the HYSPLIT trajectory model output as a “Google Earth (kmz)” format file under the “Display Options” section of the “Model Run Details” web page and trying importing it and displaying it via Google Earth [optional]

# Send the deliverables to me attached in email as a compressed file [final deliverables for Group Project#8]:

(a) “jpeg” plot and responses on answer sheet

(b) “gif” plot, text file, and responses on answer sheet

(c) “gif” plots, text files, and responses on answer sheet

**Next week: Start work on the final project**