Questions & Answers Part 2

Please type your questions in the Question Box. We will try our best to get to all your questions. If we don't, feel free to email Amita Mehta (amita.v.mehta@nasa.gov) or Sean McCartney (sean.mccartney@nasa.gov).

Question 1: Has anyone had the chance to use AlphaEarth yet, and do you anticipate it will change how GIS is used moving forward?
Answer 1: With AlphaEarth's recent release, we haven't had a chance to use it yet. Geospatial foundation models, such as AlphaEarth, have considerable potential for Geoscience in general, though. We're interested to see how the community will use AlphaEarth moving forward. Here is a brief report by Nature:
https://www.nature.com/articles/d41586-025-02412-1

Question 2: What about downloading by script?
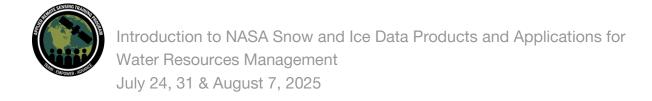Answer 2: Yes, we have options for that, too!

One of the tools we mentioned is the Data Access Tool - there are links to the tool toward the bottom of data set landing pages (example data set landing page: https://nsidc.org/data/snex17_gpr/versions/2). Here is an example with the link to the SnowEx data set used in this workshop:
https://nsidc.org/data/data-access-tool/SNEX17_GPR/versions/2.

At the bottom of the file selection list, there is a link to download a script. This provides you with a ready made script for those particular files. You can use it (and adapt it to use for other data) to download the files you filtered.

More resources for programmatic access:
https://nsidc.org/data/user-resources/help-center/programmatic-data-access-guide.
As all our data migrates to the cloud, this page has specific instructions (including script-based) for accessing as well: https://nsidc.org/data/user-resources/help-center/nasa-earthdata-cloud-data-access-guide. Briefly mentioned there is our python library, "earthaccess", which makes programmatic data access as simple as a few

lines of code. You can find documentation on that here: https://nsidc.org/data/user-resources/help-center/downloading-nsidc-daac-earthdata-cloud-data-using-earthaccess and https://earthaccess.readthedocs.io/en/latest/.

Question 3: Why is snow and ice data so important for air resource management, especially in snow-dependent regions?

Answer 3: Air and snow/ice both affect each other. Air pollution deposits on snow and ice can result in albedo changes. Air pollution also affects cloud formation and precipitation. Air temperature is affected by surface snow/ice. Also, frozen surface below snow can trap greenhouse gases.

Here is an example of how dust storms can affect snow melt: https://www.pnas.org/doi/10.1073/pnas.0913139107

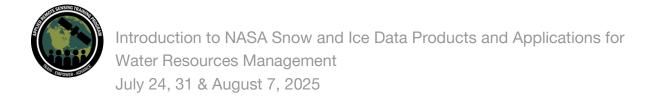**Question 4: Can't we get snow data of any region of earth?**

Answer 4: The SnowEx field and ASO air campaigns mentioned in this workshop took place in the United States. MODIS satellite data, however, have global coverage. This demo is only using these three data sets, but there are many other products that supply snow information. For example data from VIIRS.

Question 5: Where did we get AppEEaars?

Answer 5: https://appeears.earthdatacloud.nasa.gov/

Question 6: When we download the maps, it comes up without classes (Section2_demo_catchment in QGIS). Should I reclassify it again? Or can it be opened in a shapefile ?

Answer 6: I believe this refers to the raster data? If so, going to the Properties of that data layer will lead you to the Symbology tab where limits can be put on how the values in the raster are classified. Converting to a vector layer is not recommended. If the question is about the watershed vector layers, they are just the outlines and will not have any sort of classification. The idea is to use them as "cookie cutters" to constrain the raster data to the area that will contribute to a particular river or stream.

Question 7: Is it required to convert the MODIS data before adding it to QGIS? Are the results going to be different if I add the HDF or nc files as a Raster Layers instead?

Answer 7: It is difficult for QGIS to read the CRS information of some nc files and most HDF files (this particular MODIS file is a .h5 file in its native format). In order to have your data located correctly, you'll want to create a GeoTIFF outside of QGIS and then import it. If you do find a well-built .nc file, importing these as mesh layers into QGIS is easy, but be sure the CRS is read correctly.

Question 8: Can I use this data in ArcGIS 10.8? I'm still learning QGIS.

Answer 8: Yes! We were using QGIS since it is free and open source (and works on both Macs and Windows machines), but you can use ArcGIS 10.8. As 10.8 is not supported by ESRI as of this year, you may want to shift to ArcGIS Pro as a substitute. The tools I demonstrated in QGIS have parallels in the ESRI platforms.

Question 9: Is the python training on-demand?

Answer 9: If you are referring to the python tutorial given at the end of the Part 2 slide deck, it is a jupyter notebook that you can access on your own time. It guides you through steps to use earthaccess and other tools to work with SnowEx, ASO and MODIS data in a similar (but not identical) workflow as we did in this QGIS tutorial.