Question & Answer Session

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: What is the difference between SRTM & DEM?
Answer 1: The Shuttle Radar Topography Mission (SRTM) was flown aboard the space shuttle *Endeavour* February 11-22, 2000. It was an international project to acquire Interferometric Synthetic Aperture Radar (InSAR) data which were used to create the first near-global set of land elevations. This mission used single-pass interferometry, which acquired two signals at the same time by using two different radar antennas. An antenna located on board the space shuttle collected one data set and the other data set was collected by an antenna located at the end of a 60-meter mast that extended from the shuttle. Differences between the two signals allowed for the calculation of surface elevation.
A DEM is generated from InSAR data (or other data) and is a representation of a terrain's surface – created from a terrain's elevation data.

Question 2: What is the difference between a watershed and a basin?
Answer 2: They mean the same thing -- they represent area draining in a common outlet. Sometimes we use basin to refer to the main river drainage area and watersheds as sub-areas or sub-basins within the main basin. In this case watersheds drain to streams or tributaries -- eventually contributing to the main river.

Question 3: What is the smallest resolution of basins which can be determined?
Answer 3: SRTM resolution is 1-arc second global digital elevation model (30 meters) -- but for slope and drainage direction you would need 8 pixels around the center point to determine divide lines. Based on the documentation 9x9 pixels would be required.
https://hydrosheds.cr.usgs.gov/webappcontent/HydroSHEDS_TechDoc_v10.pdf

Question 4: Are these analyses suitable to process basins of around 55 square kilometer areas and less?
Answer 4: Yes, sub basin shapefiles provided by HydroSHEDS include areas less than 55 square kilometers.

Question 5: Do updated drainage basins exist for the entire world, specifically I wish to
know if Cameroon has a drainage basin map which is updated?
Answer 5: Yes, you can download drainage basins for most of the planet, including
Cameroon, from the HydroSHEDS website.

Question 6: What is the resolution of the dataset?
Answer 6: The resolution of both the drainage direction and DEM used in the demo are
3 arc-second (100 m), but you can also download coarser resolution files from the
HydroSHEDS website (e.g. 15 arc-second and 30 arc-second).

Question 7: Can we generate a river network from flow direction raster layer?
Answer 7: Yes, it is possible to generate a river network from the flow direction raster
layer. There are online tutorials to do this. In this demo we showed how to download a
river network directly from the HydroSHEDS database.

Question 8: Is this process suitable for less steep regions?
Answer 8: Referring to the presentation, flat areas are less accurate, but it is dependent
on the region. Knowing the area is also beneficial. Try delineating in a less steep area
using HydroSHEDS data.

Question 9: Are there other tools that can be used with this dataset such as watershed
area computation, distance to stream, etc.?
Answer 9: QGIS has a set of tools that can be used with HydroSHEDS data to compute
watershed area, distance to streams, etc. I recommend you research online and
explore for yourself the full range of hydrologic applications within QGIS.

Question 10: What international parameters do you use to determine the size of a
basin, sub-basin or micro-basin? Where can I download the reference?
Answer 10: The methodology HydroSHEDS uses to determine the size of river basin
and sub-basins can be found at the link below:
https://www.hydrosheds.org/page/hydrobasins

Question 11: (submitted in Spanish) Is it possible to obtain a DEM with a higher
resolution than SRTM using open source data?
Answer 11: In the US, LIDAR data for certain states can be acquired for free. Please
refer to the "Monitoring Urban Floods Using Remote Sensing" webinar by ARSET

(https://arset.gsfc.nasa.gov/disasters/webinars/urban-flooding-18). We are not familiar with global data.

Question 12: Can you sketch out the steps of integrating the layers you just built with rainfall data in order to determine the flow at a given location in the river network.
Answer 12: https://arset.gsfc.nasa.gov/disasters/webinars/urban-flooding-18