Questions & Answers Session 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 Cindy Schmidt (cynthia.l.schmidt@nasa.gov) or Amber Jean McCullum (amberjean.mccullum@nasa.gov)

Question 1: Regarding the RdNBR and its formula: in some cases, it was (dNBR)/sqrt(abs(pre-NBR)) and in others it is (dNBR)/sqrt(abs(pre-NBR/1000)). which one is correct, which is used in the FTM, and what is difference between them?
Answer 1: The correct equation is: dNBR)/sqrt(abs(pre-NBR/1000)). The difference is the scaling of the values. The first equation is if you don't multiple NBR values by 1000. The second is if you do. In the FMT the NBR values are all scaled by 1000. You can always check the Python script in the FMT folder if you want to check the equations used.

Question 2: Can I ask if auto-thresholding the rdnbr/dnbr image was tested?
Answer 2: Yes, the auto-thresholding has been tested against the MTBS archive. The RdNBR offset exhibited approximately 62% agreement with MTBS. The burn severity thresholding agreement with MTBS was 70% for the low, 40% for the moderate, and 30% for the high. These differences in agreement do not necessarily indicate that the tool has low accuracy, instead it suggests that the MTBS analysts have made adjustments based on their experience and what they're visually seeing. We (Josh Picotte et. al) have submitted a manuscript for the Association for Fire Ecologists Fire Continuum Conference proceedings that describes how the breakpoints compare to MTBS analyst derived estimates.

Question 3: In the course Exercise 1, Under Part 2, Question 2 - is there a step between 1 & 2? I'm wondering why I have zero data. When I click on the Process ESPA Data button - it tells me "No data to process"
Answer 3: Make sure you process the ESPA data first. The .tar.gz files should be placed in the FireMappingQgis\targz folder. The user guide provided with the FMT download should go through this process in more depth.

Question 4: Is there a scientific method of choosing these thresholds, or is it just that Josh Picotte knows what works for this image and burn scar?

Answer 4: The scientific method would be to develop regression equations between ground estimates of severity (e.g. the Composite Burn Index) and the remotely sensed data. Often the regression relationships are good, indicating that some general relationships can be developed. Right now, we're (Josh Picotte et. al) working on developing regression equations for the U.S. It is best if whomever is estimating the thresholds has an idea of whether the visual thresholds actually correspond well with on the ground burn severity patterns.

Question 5: For the Landsat images to be used, will it be necessary to do the atmospheric and radiometric correction or there is a free download platform with the corrections?

Answer 5: No, the data will be automatically Top of Atmosphere (TOA) corrected by ESPA.

Question 6: What method would you recommend applying to calculate or estimate the amounts of CO_2 emitted into the atmosphere by forest fires, considering that with the present technique we will establish the affected area?

Answer 6: You would have to develop models that take into account the amount of area burned, estimated amount of pre-fire fuels burned, and the amount of CO_2 released related to the burn severity category.

Question 7: Is it possible to change the colors in the viewer so active fires are more discernible? As compared with the background?

Answer 7: I don't believe you have the option to change the color categories. However, I know that they are updating the tool, and you could send them this suggestion via email if you are interested. http://gwis.jrc.ec.europa.eu/contactus/

Question 8: Are you able to download the MODIS and VIIRS active fire data?

Answer 8: Yes, you can download data here:
http://gwis.jrc.ec.europa.eu/applications/data-and-services/

Question 9: Can we isolate the agricultural waste mass burning to forest fire and if yes then how?

Answer 9: Probably not, because burn severity generally relates best to forest and shrub fires. Generally, with agriculture fires we can only tell if the area burned.

Question 10: Would it be reasonable to use predetermined thresholds on RdNBR rather than calibrating dNBR from the RdNBR?

Answer 10: Yes, it would be reasonable if you had determined relationships between RdNBR and on the ground burn severity. Admittedly, RdNBR does not always work and recent research has started to point out some of its limitations.

Question 11: What is the revisit time of MODIS and VIIRS sensors?

Answer 11: MODIS and VIIRS have a near daily revisit time, depending on your location on Earth. There are issues with clouds, especially in tropical regions, so you may not have clear imagery each day.

Question 12: In QGIS my layers keep vanishing as I click through steps in the FMT, and I have to add them again. Is this expected?

Answer 12: The original full Landsat will disappear once you load your .qgs project file. After that, they won't disappear until you load another .qgs project file. I generally save my .qgs files as I edit my fire parameters.

Question 13: I am very interested in the fire emissions data and how that is derived, where can we find further information?

Answer 13: You can click on the Information icon next to Fire Emissions and you will be taken here: http://gwis.jrc.ec.europa.eu/about-gwis/technical-background/fire-emissions/

It looks like they are currently updating the website, but the developers have told us there will be a technical documentation document available soon. So I would check back here: http://gwis.jrc.ec.europa.eu/about-gwis/ too.

Question 14: Is there any possibility to add/upload a vector file (Esri shape file) for our Area of Interest in GWIS and download various other product layers for offline analysis?

Answer 14: No, I don't believe either of those options are available currently. However, they are updating the website and can take suggestions via their contact page here: http://gwis.jrc.ec.europa.eu/contactus/

You can however, download the MODIS and VIIRS Active Fire data here:
http://gwis.jrc.ec.europa.eu/applications/data-and-services/

Question 15: If I want to examine a fire that occurred in the past in the US, how far back (in years) into the past can I get data to perform these analyses?
Answer 15: We (Josh Picotte et. al) generally only go back to 1984, because this is when we began assessing fires using Landsat 5. You could potentially go back to 1972, but the Landsat imagery will have lower resolution and the bands are different.

Question 16: How long after the satellite pass, the active fire data of MODIS and VIIRS are available?
Answer 16: Active fire data can be available within 3 hours of the satellite overpass. You can go here for more information: https://earthdata.nasa.gov/earth-observation-data/near-real-time/firms

Question 17: How can I extract all fire related variables within my country boundary fro GWIS platform?
Answer 17: There is an option in GWIS to get GWIS estimates per country under Analysis Tools at the very bottom of the options on the left. You can download data here too: http://gwis.jrc.ec.europa.eu/applications/data-and-services/
You can also use NASA Worldview to view active fire locations, and download data for a specific area of interest: https://worldview.earthdata.nasa.gov/

Question 18: Is there currently any way to see in the GWIS, the fire danger forecast for a previous date?
Answer 18: You can either select a custom date range or look at the last 30 or 90 days by clicking one of the buttons

Question 19: I want to know if the methodology we used for to calculate the Burn Area and Burn Severity can be used for all situation or for all countries?
Answer 19: The methodology for burned area (essentially tracing) should work for all countries. The FMT's burn severity methodology will not work for every country. This is because the burn severity methodology is only a potential estimate of burn severity. It may be necessary to determine the actual relationships between on the ground burn severity and the dNBR estimates of severity.

Question 20: Can I use these information in GWIS in a GIS?

Answer 20: Yes, you can download some of the data from GWIS (MODIS, VIIRS, Fire Danger Forecast and the Emissions) here:

http://gwis.jrc.ec.europa.eu/applications/data-and-services/

Question 21: Is it possible to extract quantities of emissions, e.g for CO_2 for a given period at national level using the GWIS?

Answer 21: You can download the emissions data here:

http://gwis.jrc.ec.europa.eu/applications/data-and-services/

There is also a new feature where you can analyze data on a country-wide basis. Take a look at the bottom left of the viewer and click on "GWIS Estimates Per Country".

Question 22: What are the scale of fires that can be detected in the FMT?

Answer 22: Technically, the smallest fire would be 900 square meters using Landsat imagery. However, we generally don't try to measure fires < 10 hectares.

Question 23: Can I use GWIS to make almost real-time alerts?

Answer 23: Yes, you can look at actively burning wildfires. There are a few other websites you can use as well.

- FIRMS: https://earthdata.nasa.gov/earth-observation-data/near-real-time/firms
- NASA Worldview: https://worldview.earthdata.nasa.gov/