



## HAZA02 - RUS environment demo: burned area mapping in Portugal with Sentinel-2 data using ESA SNAP Toolbox

### THEORY QUESTIONS

**Q: Are Sentinel-2 Level 2A data available only over Europe?**

A: The Level 2A data (Bottom-Of-Atmosphere) are systematically available over Europe as of April 2017. In some cases there might be Level 2A data available for other locations as well; however these are not generated systematically. You can use the Sen2Cor algorithm to produce Level 2A data from Level 1C (available for all land and coastal areas).

**Q: Are the expressions in BandMath operator written in Python?**

A: No, the expression syntax is very similar to the one used in the C, C++ or Java, however no knowledge of these languages or programming is necessary. All operators and their usage are explained in the SNAP Help - The Band Math Expression Editor.

**Q: Could you please clarify how to proceed with collocation?**

A: The Collocation Tool (Raster -> Geometric -> Collocation) allows collocating two spatially overlapping products. Collocating two products implies that the pixel values of one product (the slave) are resampled into the geographical raster of the other (the master).

In order to avoid naming conflicts, the Collocation Tool allows renaming both master and slave components such as bands and bitmask definitions according to a user defined pattern. Here we used the suffix “\_June” for the first image (4<sup>th</sup> June) and “\_July” for the second image (4<sup>th</sup> July).

**Q: Why do we need to mask out water bodies?**

A: In certain circumstances (sun glint, etc.) water bodies can show similar NBR difference as recently burned areas. It is necessary to mask them out to avoid false detections.

**Q: Why do we use the same threshold for dNBR and RBR?**

A: This is a valid question; the USGS classification indeed refers to dNBR, however without field data it is not possible to reliably translate the RBR values to burn severity. Applying the USGS classes to RBR values can result in classifying the pixels in lower burn severity class than using dNBR.

**Q: Is it possible to identify different severities of burnt area?**

A: The burn severity can be empirically estimated from the Relativized Burn Ratio (RBR) values we have calculated in combination with field data.

**Q: Can the burned area be calculated?**

A: In theory you can calculate the area by counting pixels with RBR value corresponding to burned land or use threshold to convert the RNBR to binary raster and then to polygonise it in GIS SW such as QGIS.

**Q: What is the smallest burned area that can be detected?**

A: The smallest burned area that can be detected with this approach is dependent on the resolution of



the original bands. We use the NIR (10 m) and SWIR (20 m) bands, therefore fires as small as few tenths of metres could be detected. However, be aware that a validation is needed to confirm that the detected area is not a false alarm.

**Q: Could the same approach be applied to Sentinel-3 data over burned areas/wildfires?**

A: The same approach is not possible using the S-3 OCLI data as the OCLI sensor does not provide SWIR bands. However, the NIR and SWIR bands are both available from the S-3 SLSTR sensor in 500 m resolution. The low resolution of SLSTR (500 m, compared to 10-20 m of S-2) must be taken into account when assessing the burned area.

**Q: Were the results compared with a field survey?**

A: No, the webinar is only intended for demonstration of the remote sensing data processing. Field survey is necessary to confidently relate the RBR values to burn severity.

**Q: Are there any tests for burned areas mapping with Sentinel-1 (radar data)?**

A: There is a number of studies exploring the use of Sentinel-1 for burned area mapping. SAR data are especially useful in case the area-of-interest is under cloud cover or obscured by smoke.

## RUS QUESTIONS

**Q: How do I register for RUS Virtual Machine?**

A: To register for the RUS VM go to the [RUS Copernicus](#) portal and register through the Copernicus Users' Single Sign On. During the activation of the account you will receive three e-mails; your account must be activated by the RUS front desk, therefore please allow few days for the process to be completed. Once your account is active you can log-in to the RUS platform and go to "Your Dashboard" and click "Request a new User Service". Fill all the required fields to describe the desired VM and your project or specify the training code HAZA02 to repeat this webinar. It might take a few days for the VM to be provided.

**Q: Is Sen2Cor available on the RUS VMs?**

A: Yes, the RUS VM machines come preinstalled with Sen2Cor integrated in SNAP.

**Q: What code should I use when completing the RUS form to request a VM for my own purposes? I've seen you have completed something just for showcasing and the two options appear, but is it ok to complete something random?**

A: The options appear even if you fill a random word in the text box, however if you want to repeat the webinar you need to provide the training code (HAZA02). The code indicates to the front desk what VM and training materials they should provide to you.

**Q: Will there be any advanced webinar in the future?**

A: Advanced webinars for a limited number of applicants are indeed planned for the future. All past and future trainings can be found on the [RUS Training platform](#) and will be announced on [Twitter](#), [Facebook](#) and [LinkedIn](#).