Using the Normalized Burn Ratio (NBR)

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Reference:

https://www.usgs.gov/land-resources/nli/landsat/landsat-8?qt-science_support_page_related_con=0#qt-science_support_page_related_con

https://sentinel.esa.int/web/sentinel/missions/sentinel-2

Outlining process

- Spectral profile for Landsat-8 and Sentinel-2 on Kangaroo island during fire

- Normalized Burn Ratio for the Landsat 8 and Sentinel-2 on Kangaroo island before and during fire

- Difference image that highlights the change between the two time periods for the Landsat-8 and Sentinel-2 imagery

- Spectral profile for healthy agricultural vegetation (crop circle) vs. bare earth for Landsat and Sentinel-2
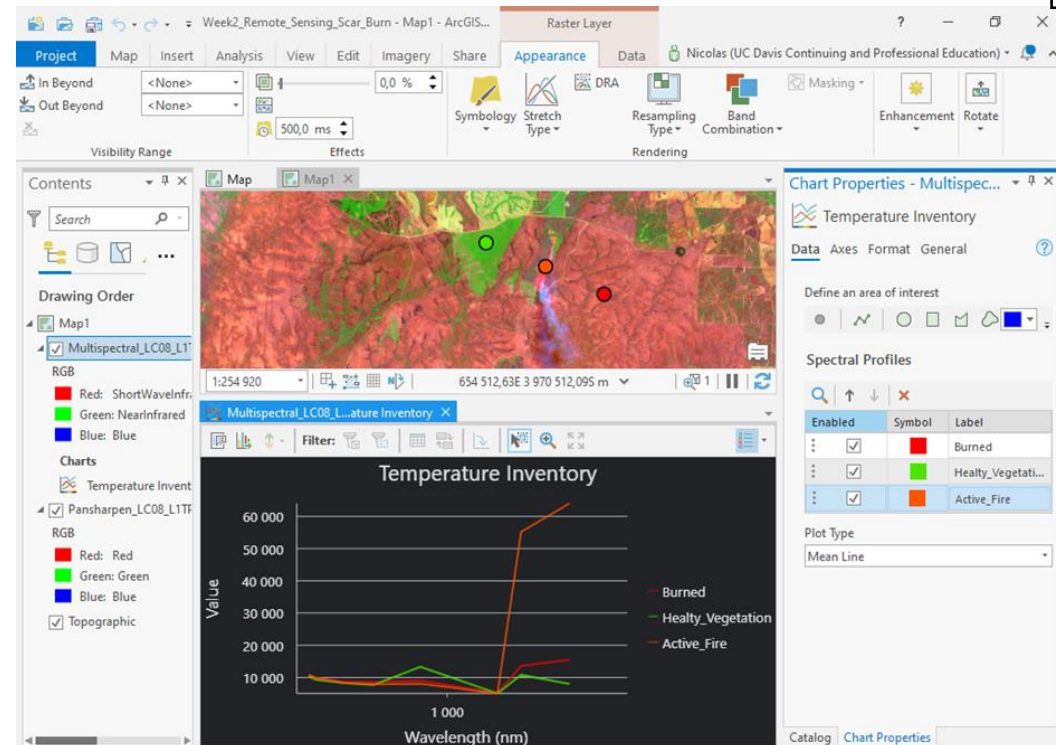
Spectral profile for Landsat 8 OLI on Kangaroo island during fire on 09.01.2020

Data information
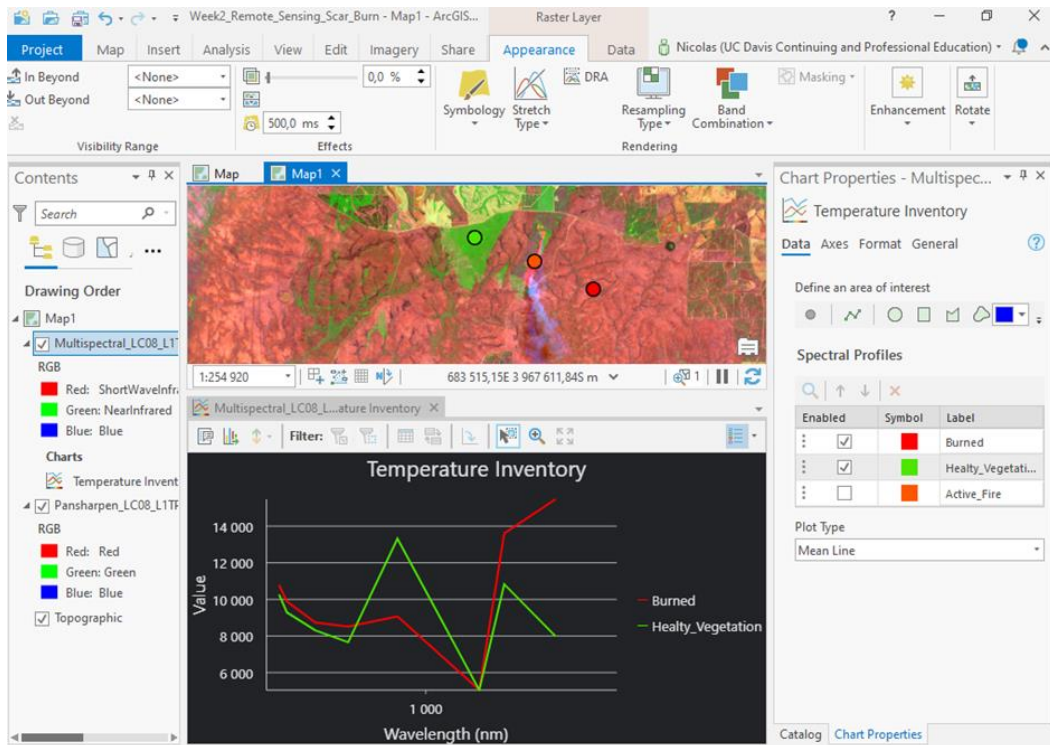
Band Metadata
- CoastalAerosol
- Blue
- Green
- Red
- NearInfrared
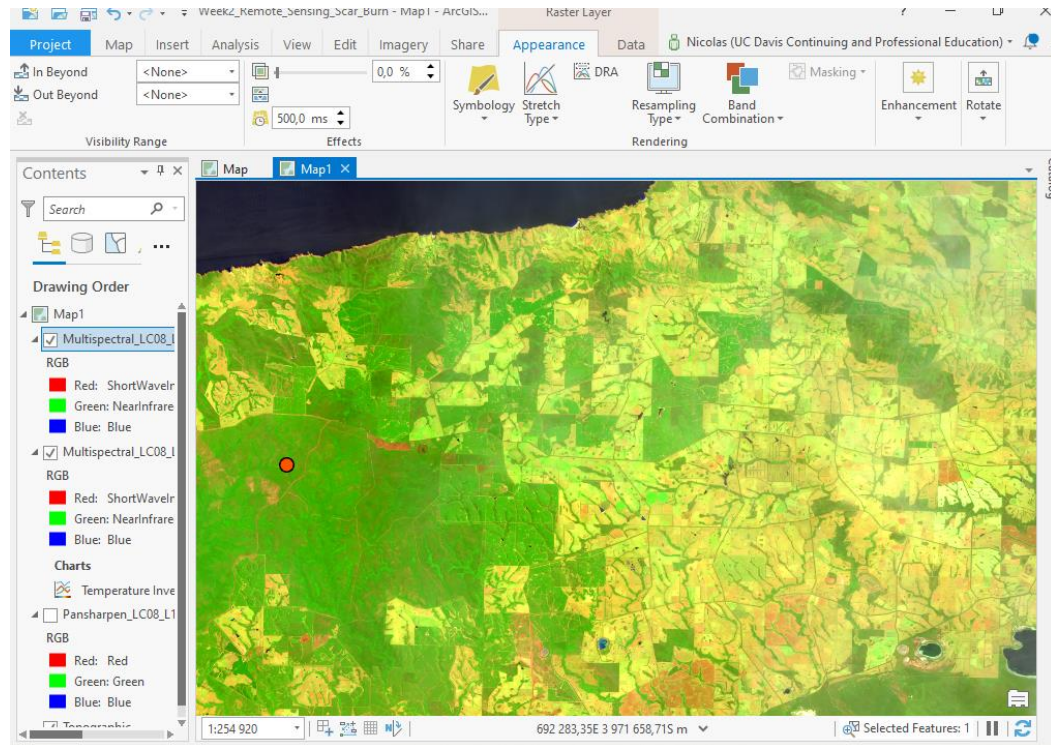- ShortWaveInfrared_1
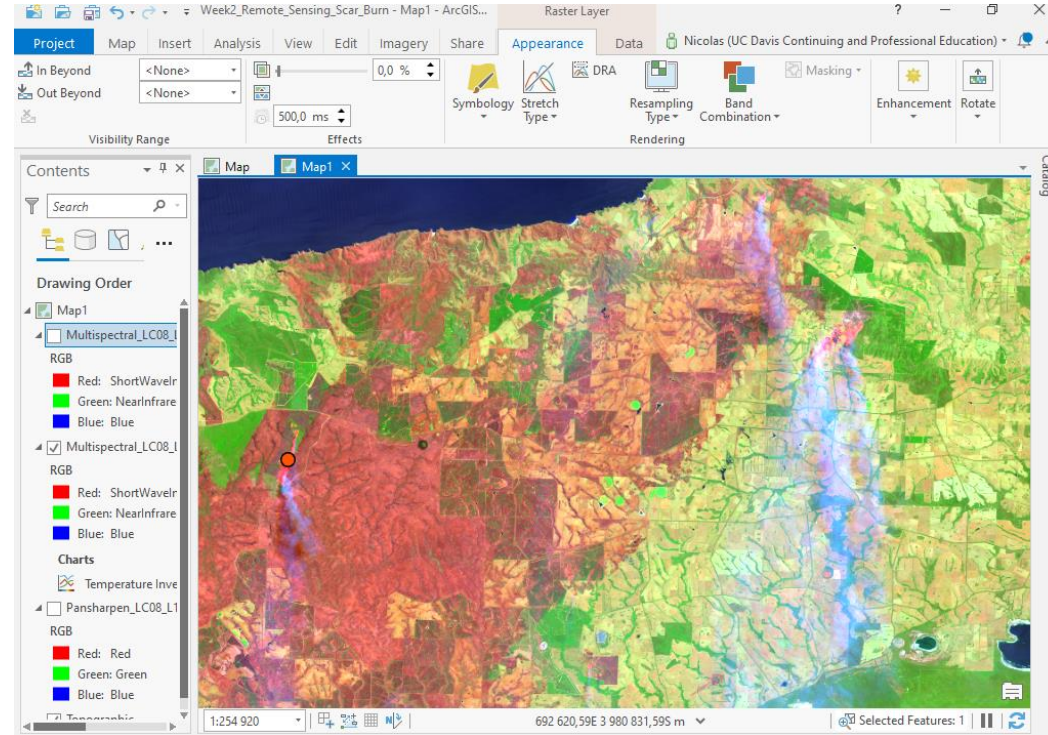- ShortWaveInfrared_2
- Cirrus

Cell size X: 30
Cell size Y: 30

Pixel depth: 16 Bit

Spectral profile illustrating variable conditions:
- Burned
- healthy vegetation outside the range of fire

Spectral profile illustrating variable conditions:
- Fire
- Burned
- healthy vegetation outside the range of fire

Normalized Burn Ratio for the Landsat 8 on Kangaroo island before and during fire

Data information

08.12.2019: before fire

09.01.2020: during fire

Band Metadata

> CoastalAerosol
> Blue
> Green
> Red
> NearInfrared
> ShortWaveInfrared_1
> ShortWaveInfrared_2
> Cirrus

Cell size X: 30
Cell size Y: 30

Pixel depth: 16 Bit

- Healty vegetation appears in green and burned area in red
- Difference is clearly visible before and after bushfire extension

Difference image that highlights the change between the two time periods for the Landsat 8 imagery (08.12.2019- 09.01.2020)

- With this new raster, we clearly can see the spread of the bushfire from West to East

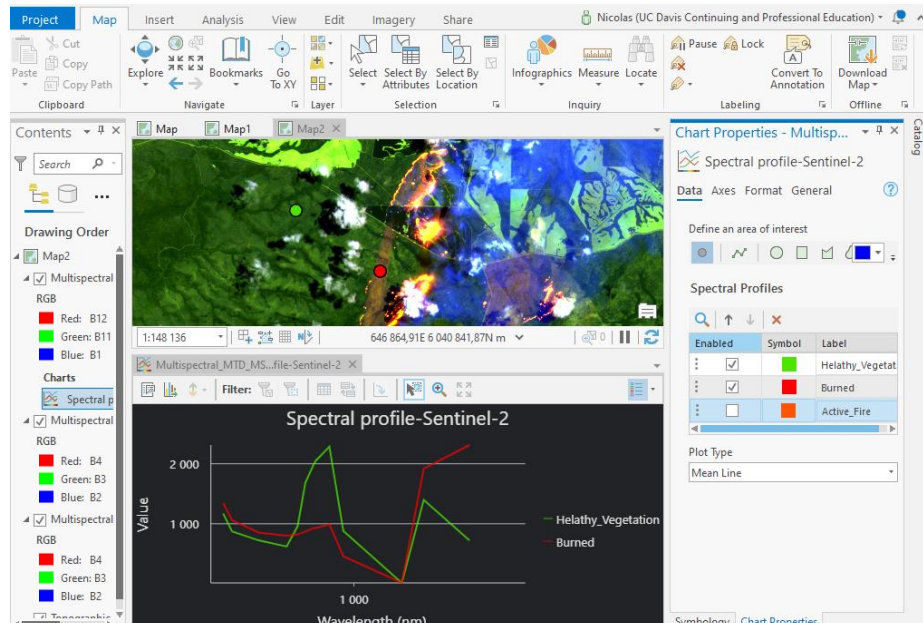- Lighter color shows higher difference between the two time periods
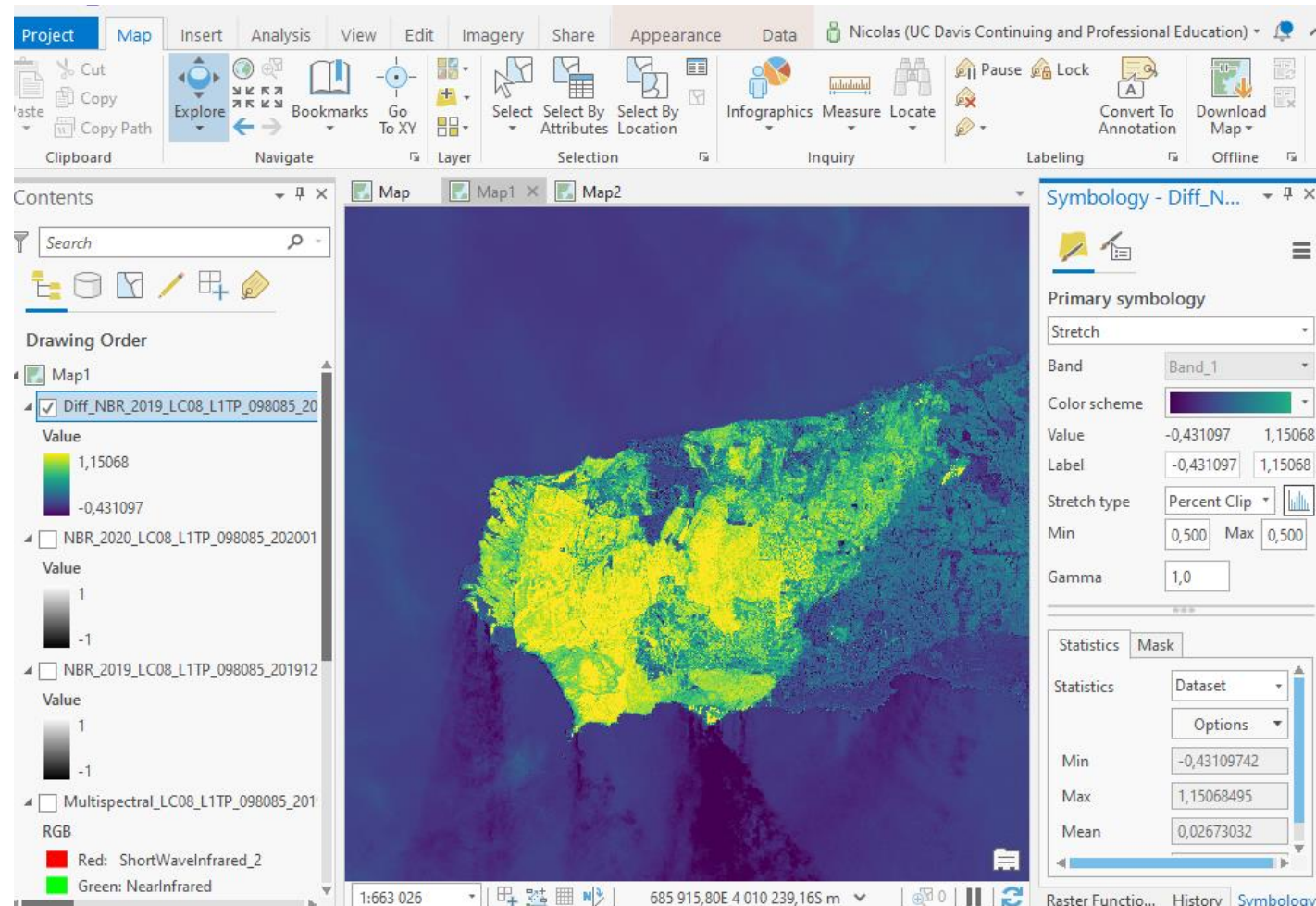
Data information

Band metadata:

Single band corresponding to difference between the NBR

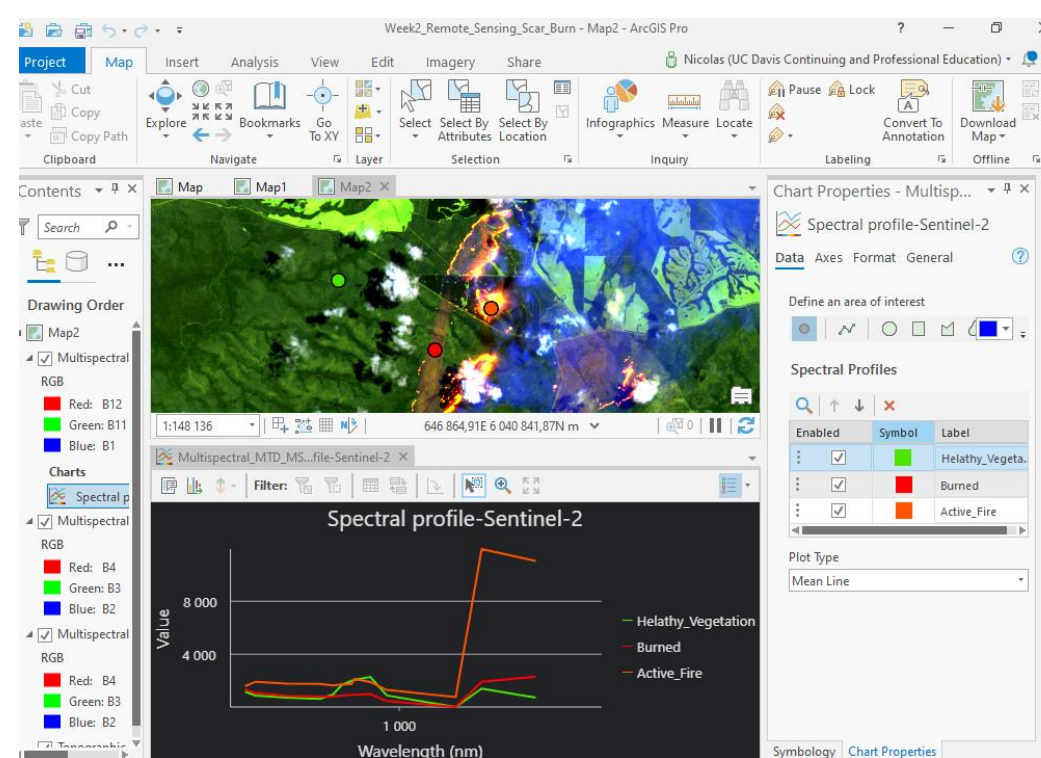Cell size X: 30
Cell size Y: 30

Pixel depth: 32 Bit

Spectral profile for Sentinel-2 on Kangaroo island during fire on 31.12.2019

Spectral profile illustrating variable conditions:
- Burned
- healthy vegetation outside the range of fire

- The 3 red-edge bands are clearly visible on the healthy vegetation spectral profile which is different from Landsat data

Spectral profile illustrating variable conditions:
- Fire
- Burned
- healthy vegetation outside the range of fire

Data information
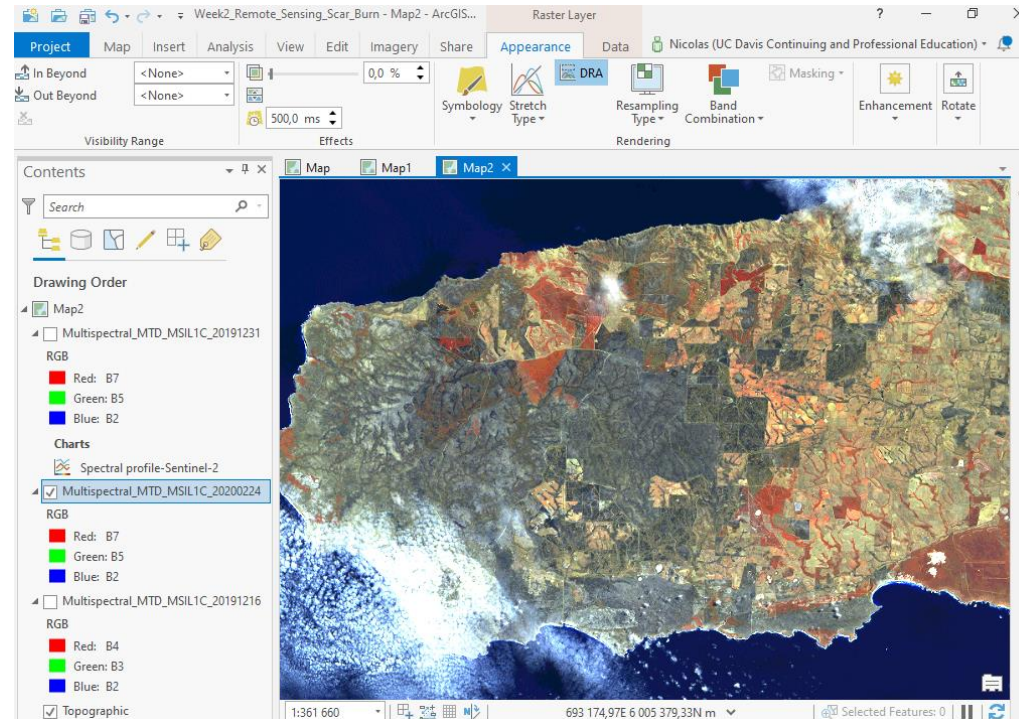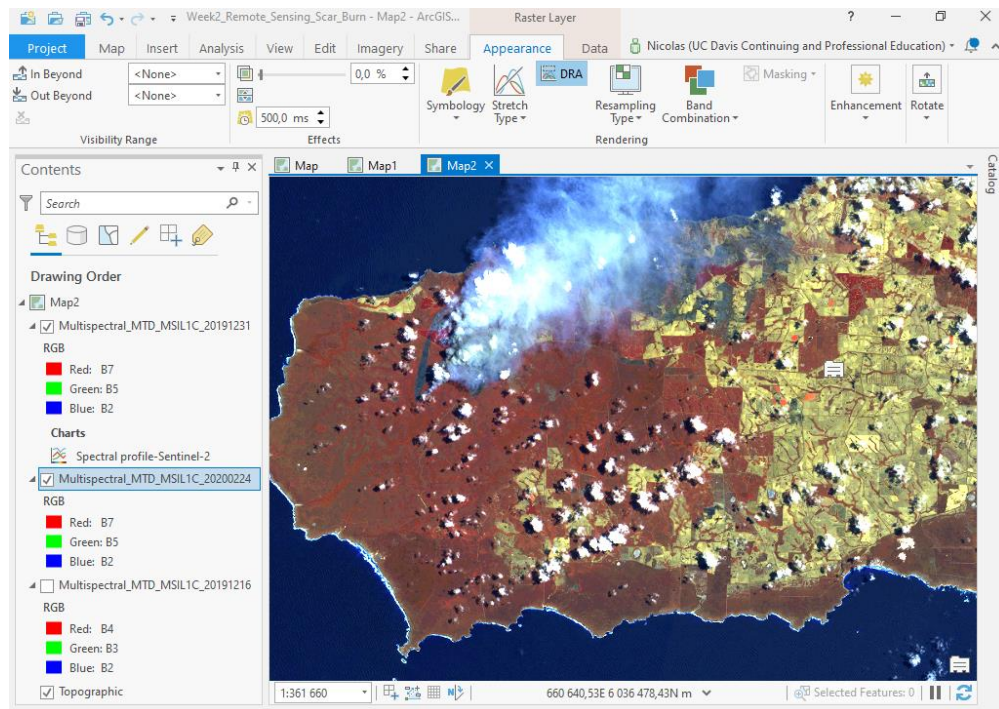
Cell size X: 60
Cell size Y: 60

Pixel depth: 16 Bit

Normalized Burn Ratio for the Sentinel-2 on Kangaroo at the start and during fire

31.12.2019: at the fire start

24.02.2020: during fire

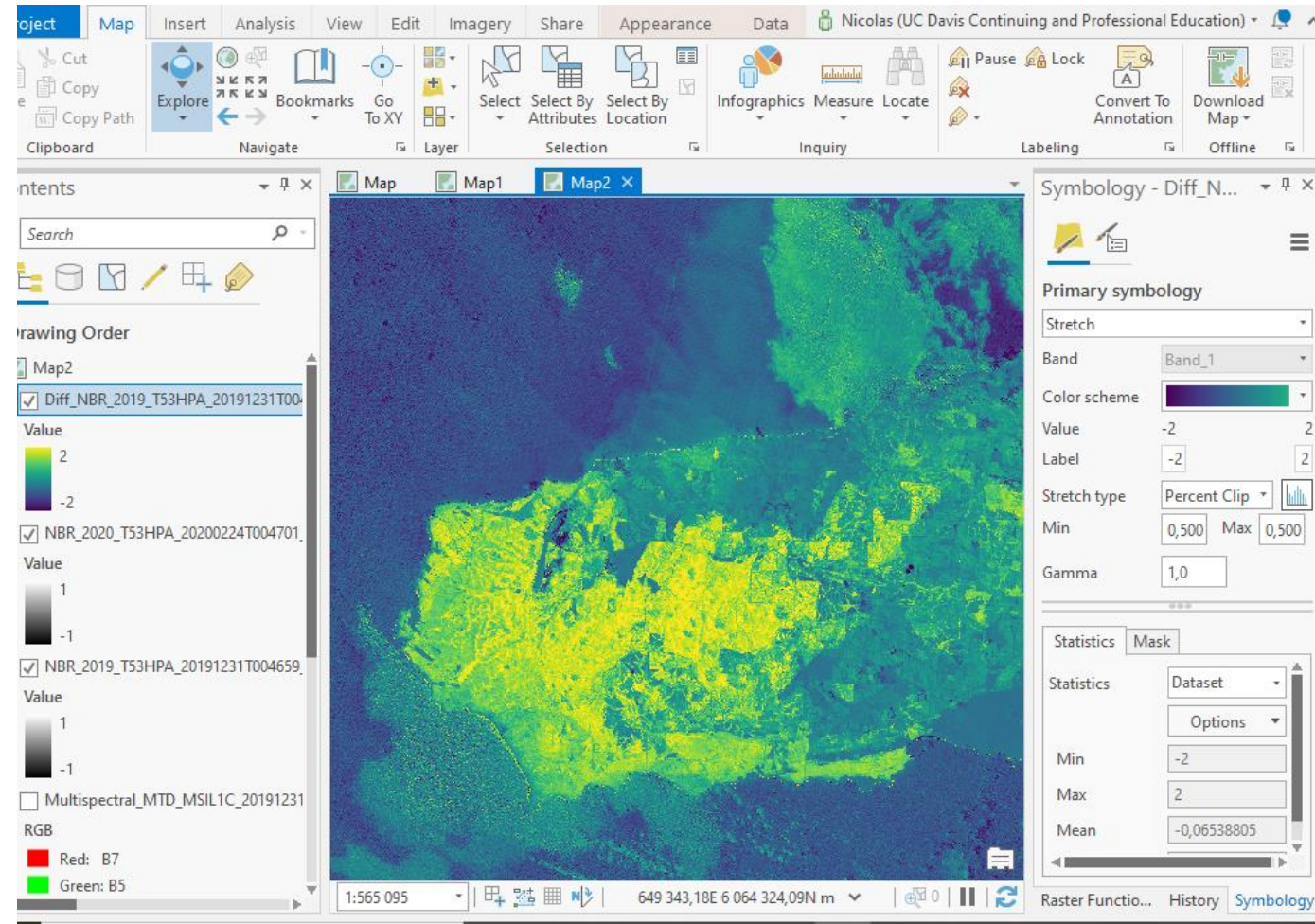Data information

Cell size X: 60
Cell size Y: 60

Pixel depth: 16 Bit

- Healty vegetation appears in red and burned area in black
- Difference is clearly visible at the start and after bushfire extension

Difference image that highlights the change between the two time periods for the Landsat 8 imagery (31.12.2019 - 24.02.2020)

- With this new raster, we clearly can see the spread of the bushfire from West to East

- Lighter color shows higher difference between the two time periods

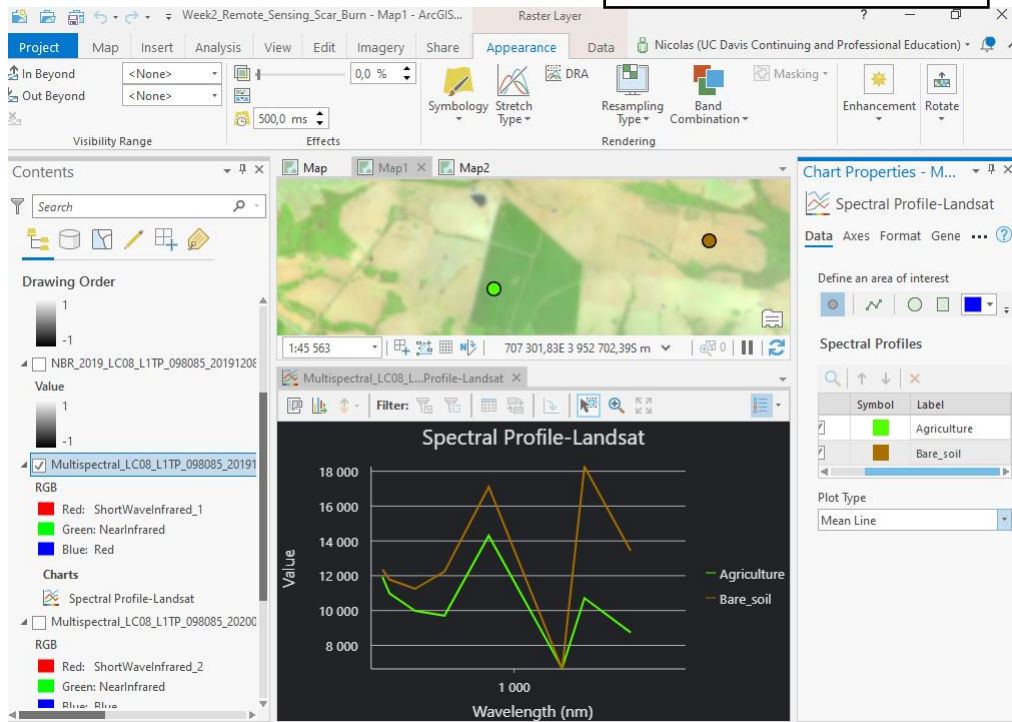Data information

Band metadata:

Single band corresponding to difference between the NBR

Cell size X: 20
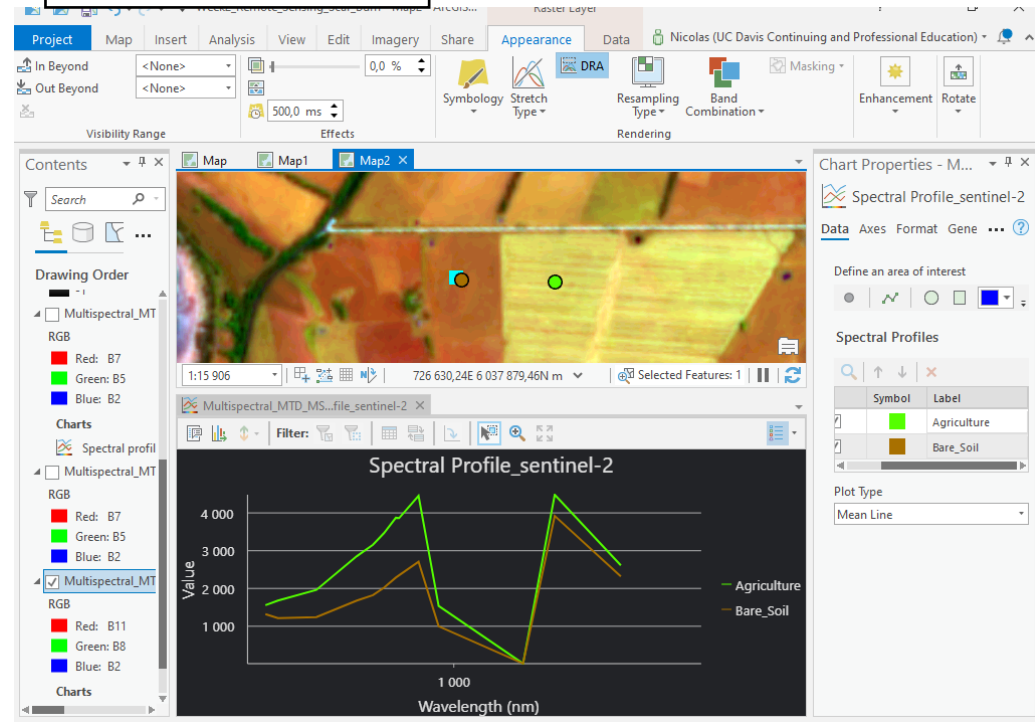Cell size Y: 20

Pixel depth: 32 Bit

Spectral profile for healthy agricultural vegetation (crop circle) vs. bare earth for Landsat and Sentinel-2

08.12.2019

16.12.2019

- Landsat-8

- Sentinel-2

- We see that Sentinel-2 has a finer resolution to define healthy agriculture with red-edge bands