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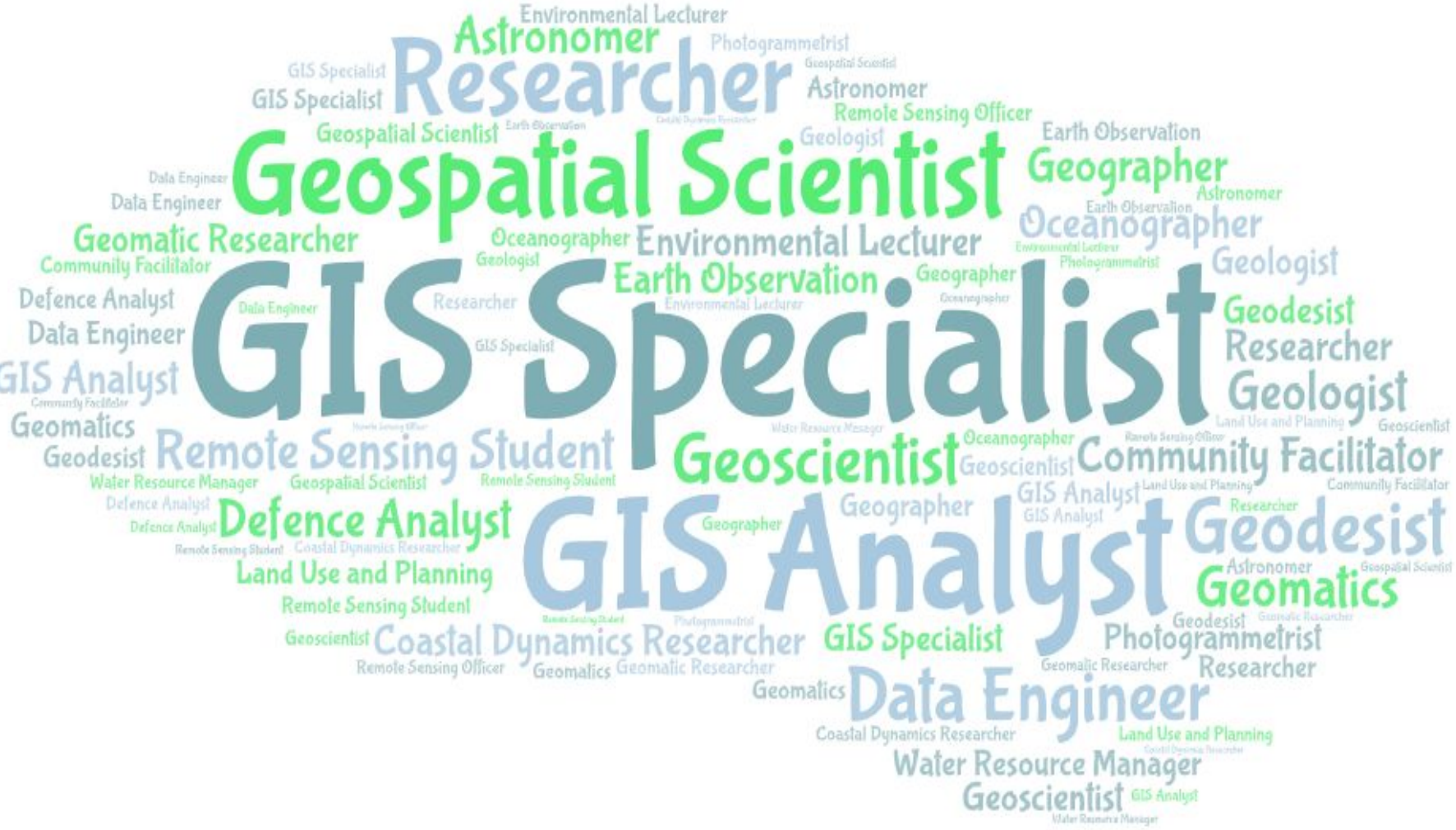
Flood Mapping using the Sentinel-1 Imagery and the ESA STEP S1 Toolbox

Luigi Selmi

lselmi@datiaperti.it

Floods are affecting communities more frequently than in the past.

Enrico Pollastrini - Family saved from the flooding of Serchio, 1845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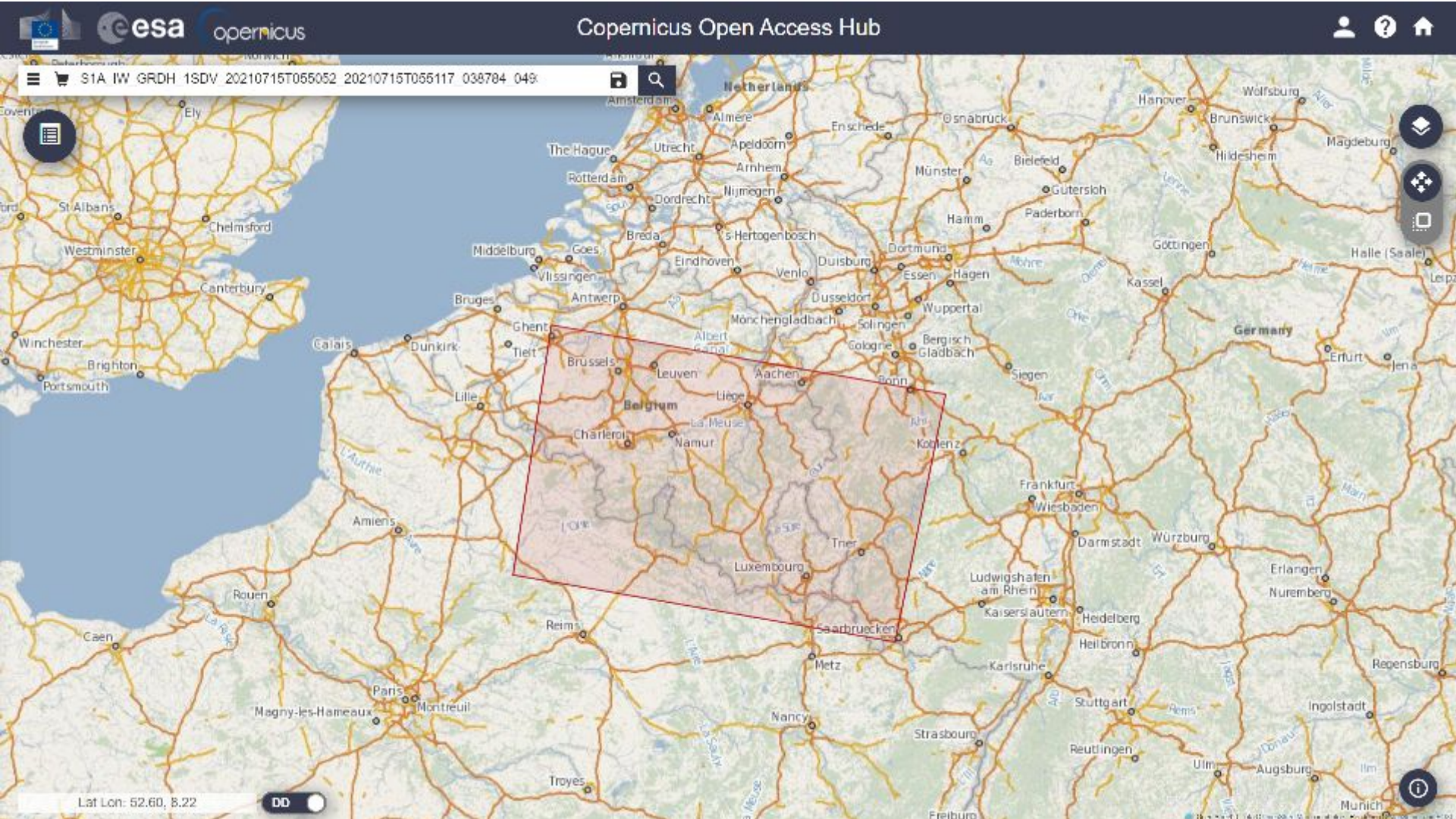
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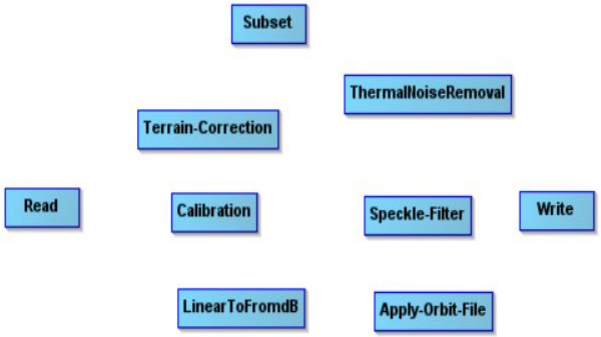
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Read
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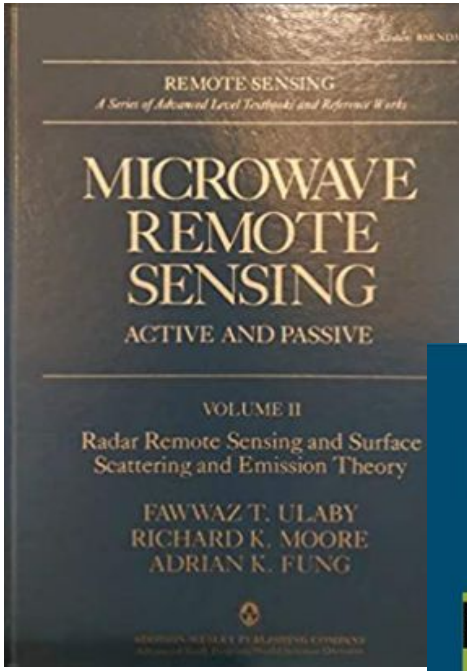
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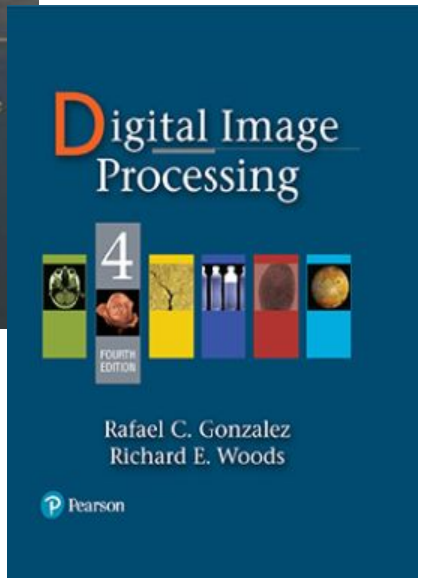
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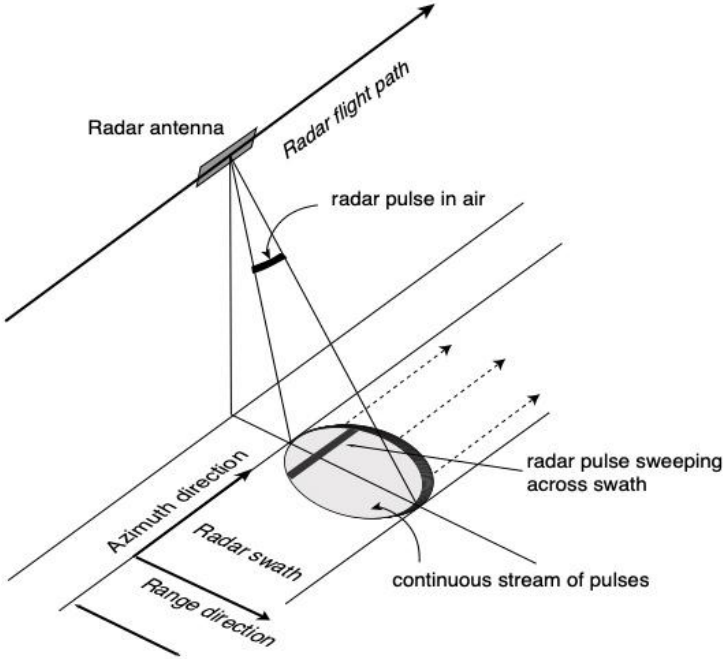
Radar Remote Sensing

The Theoretical Minimum

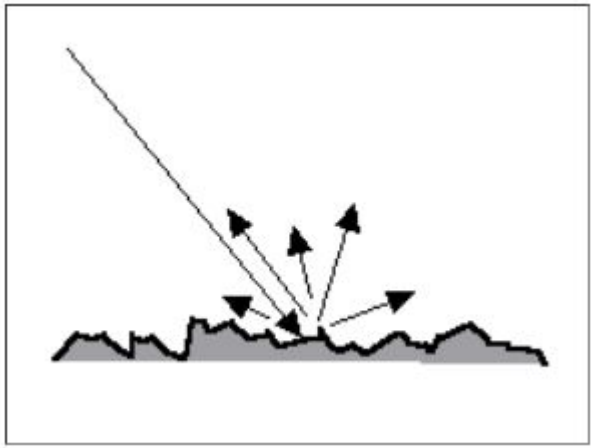
Radar Remote Sensing

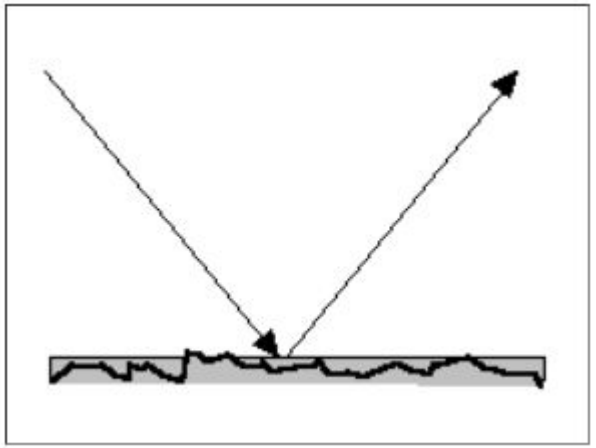
Synthetic Aperture Radar



Radar Remote Sensing

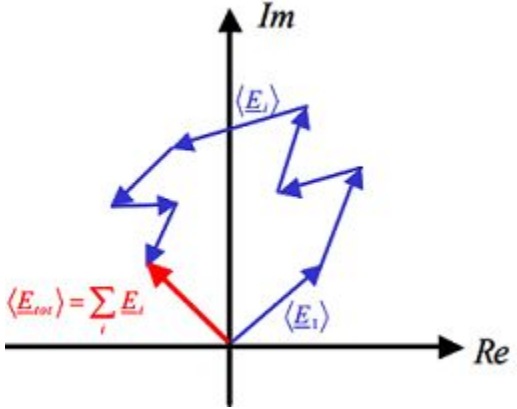
Radar Backscattering





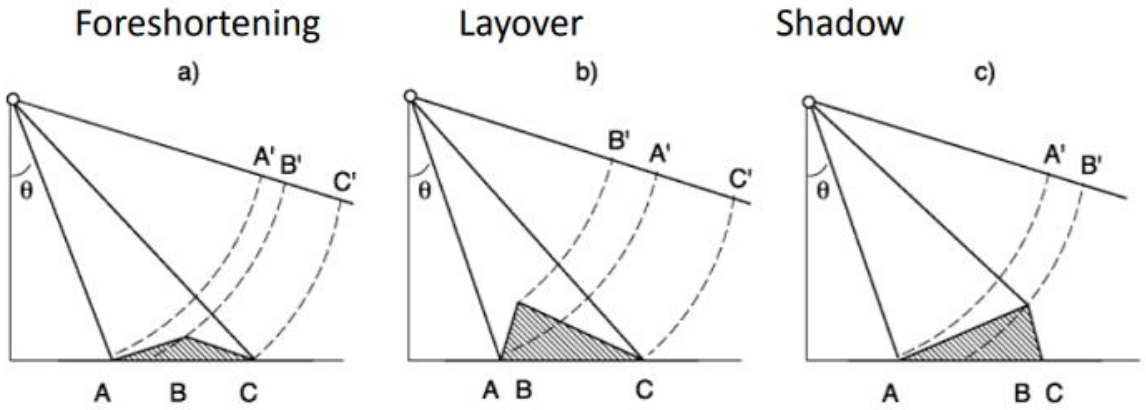
Radar Remote Sensing

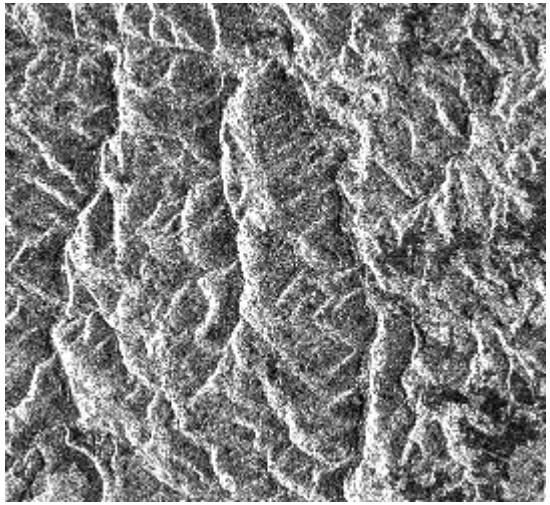
Speckle



Radar Remote Sensing

Geometric Distortions

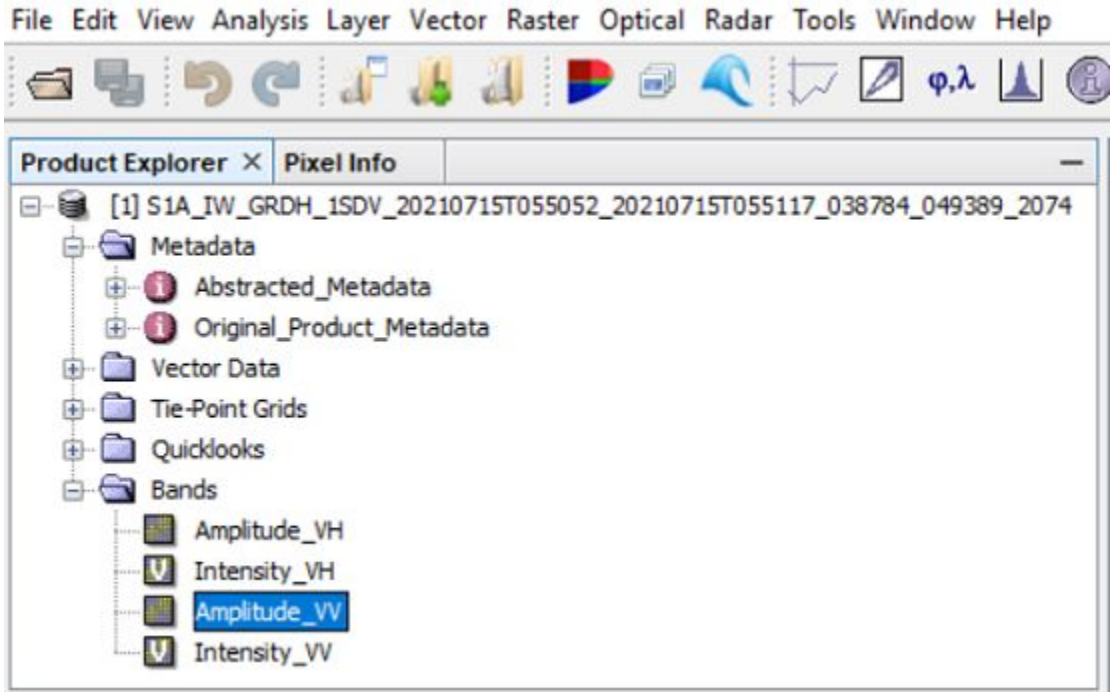




SAR Image Processing

SAR Image Processing

The Sentinel-1 GRD Product



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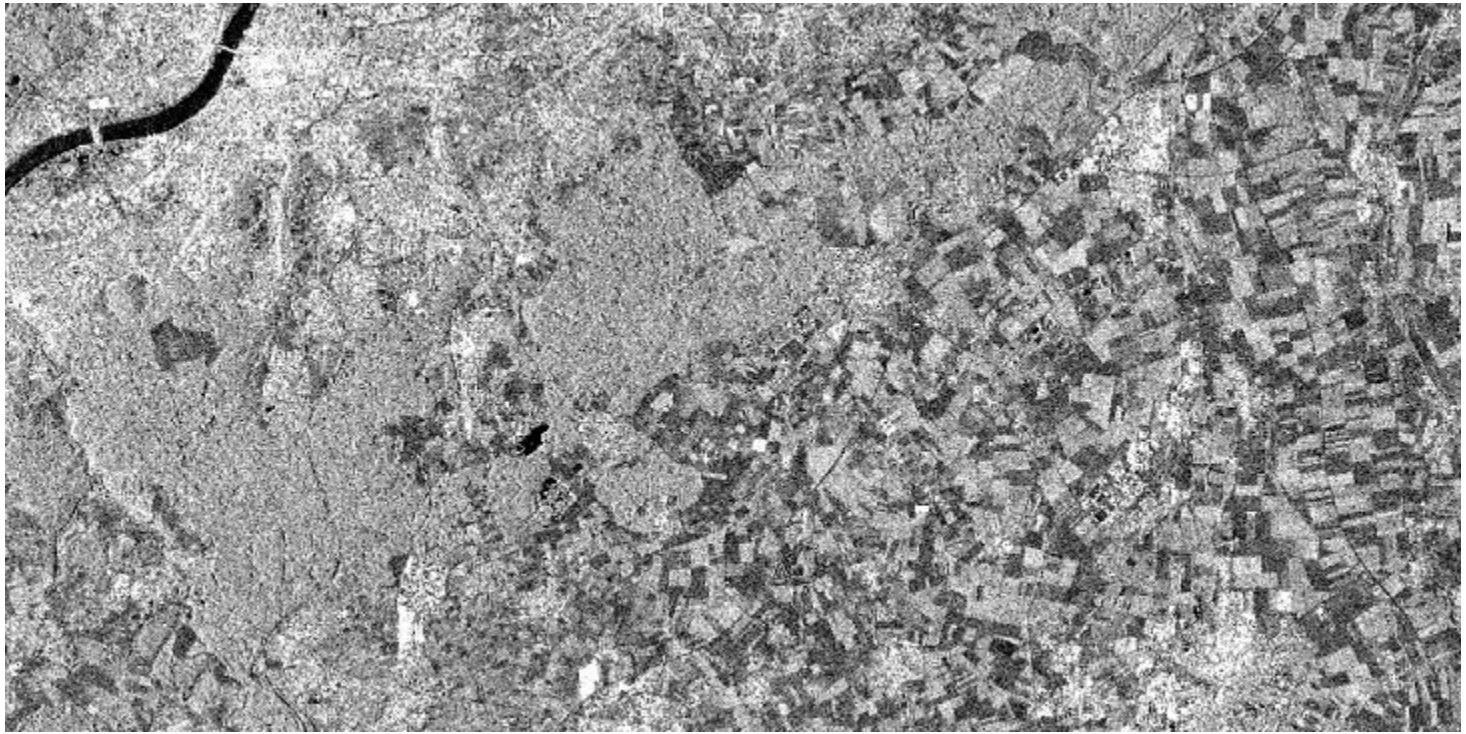
Subsetting, Thermal Noise Removal, and Calibration



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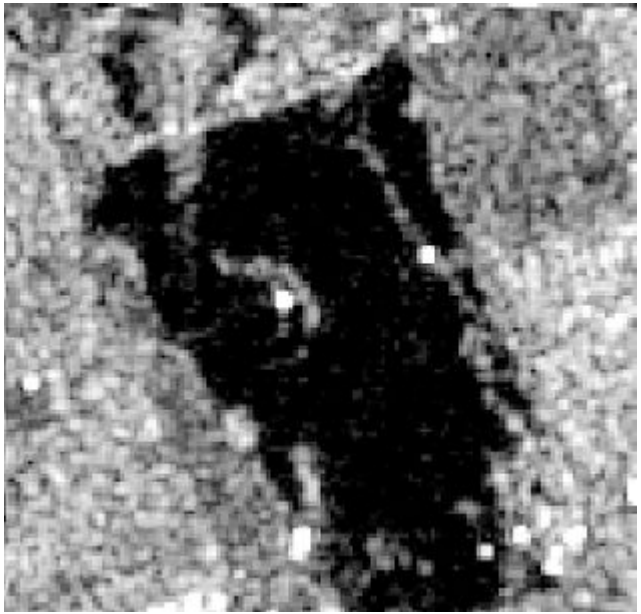
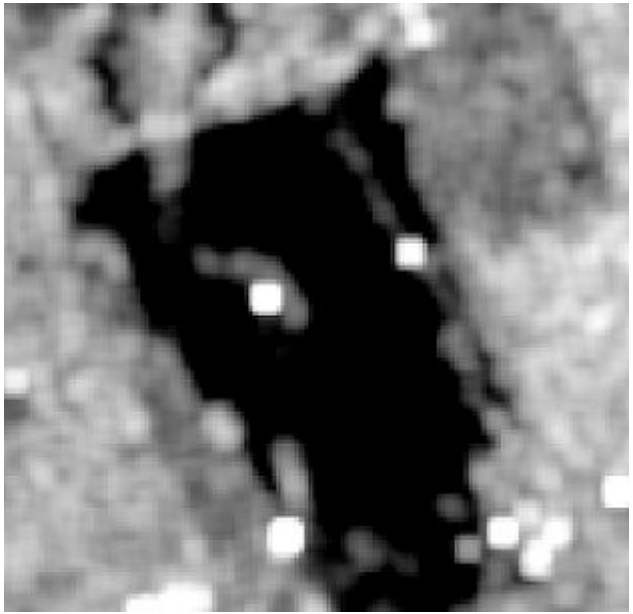
Speckle reduction





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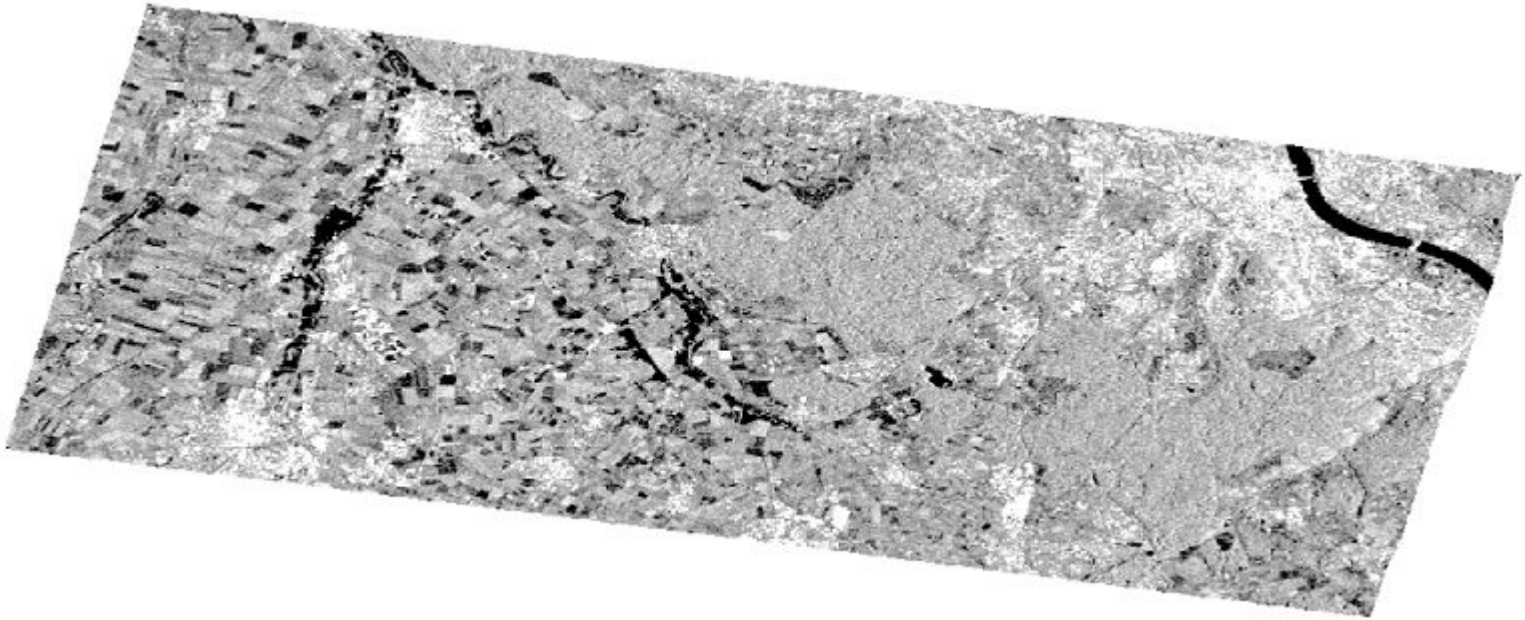
Orbit file and Terrain correction



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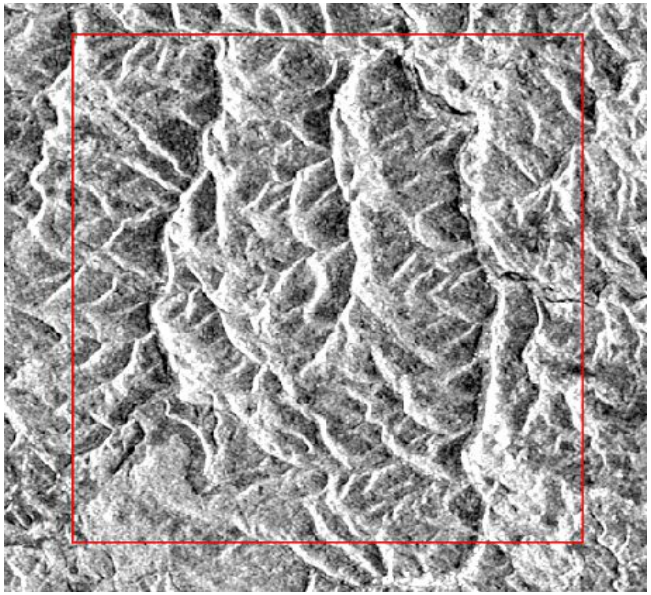
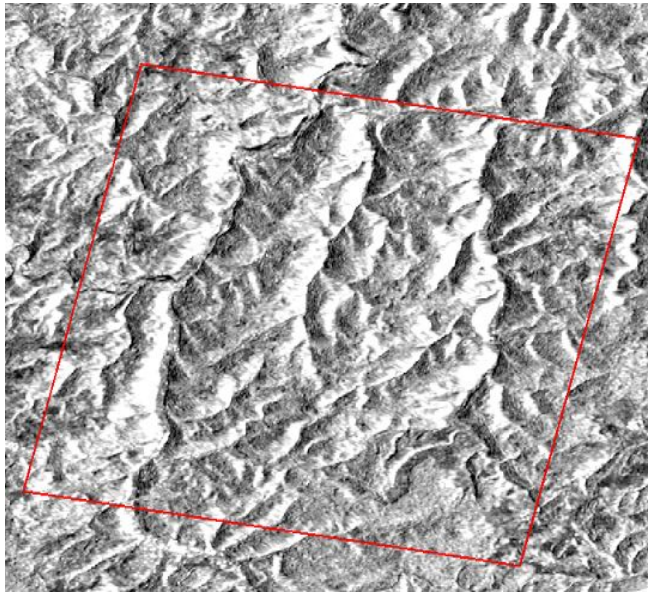
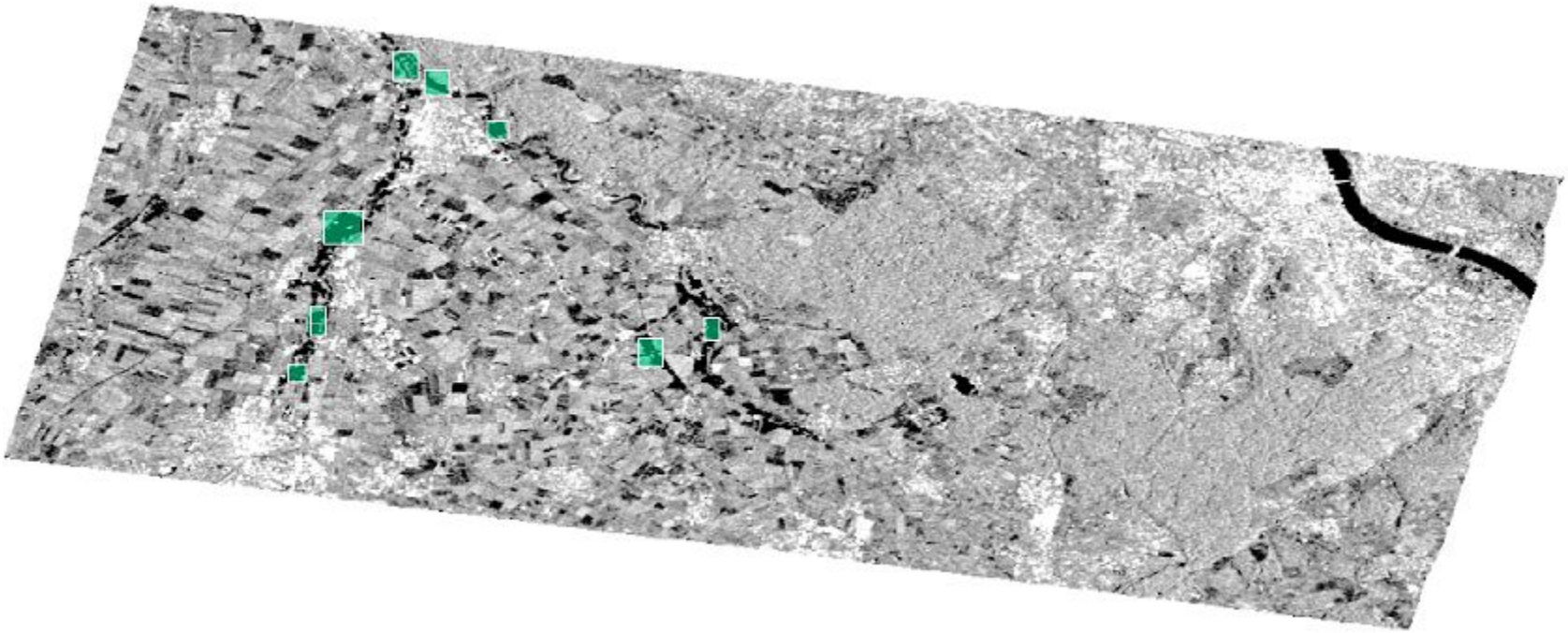
Terrain correction over mountain areas





SAR Image Processing

Thresholding #1



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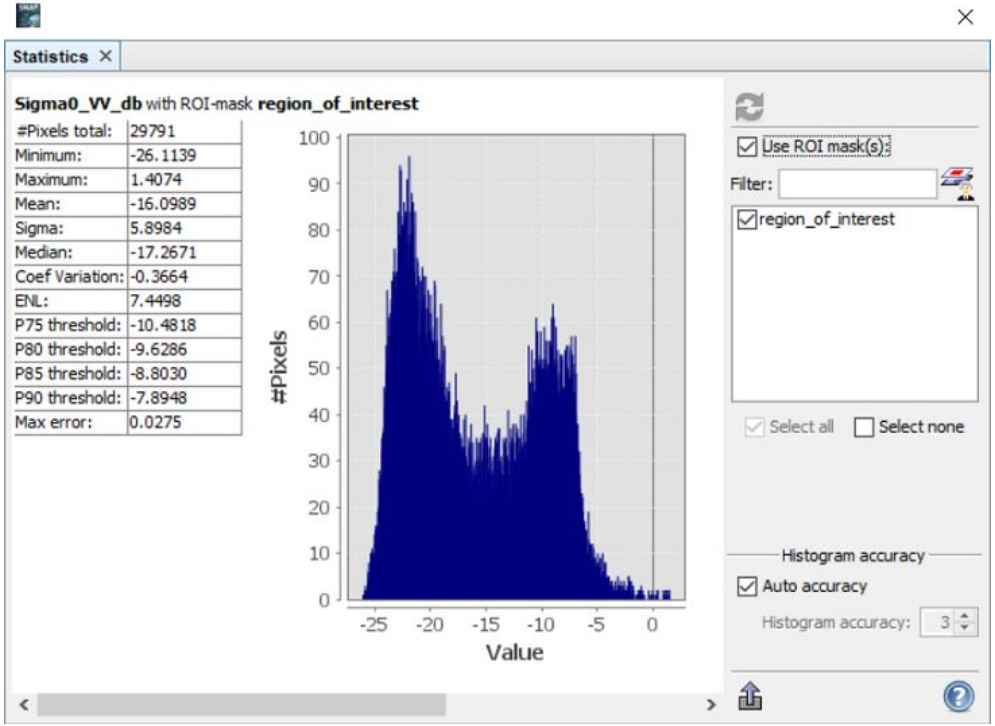
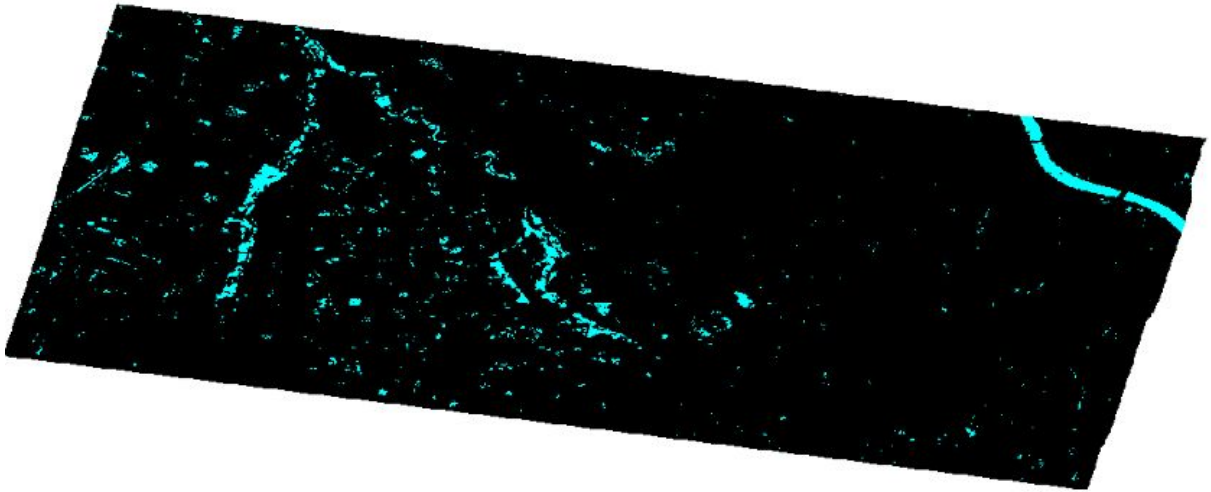
Thresholding #2



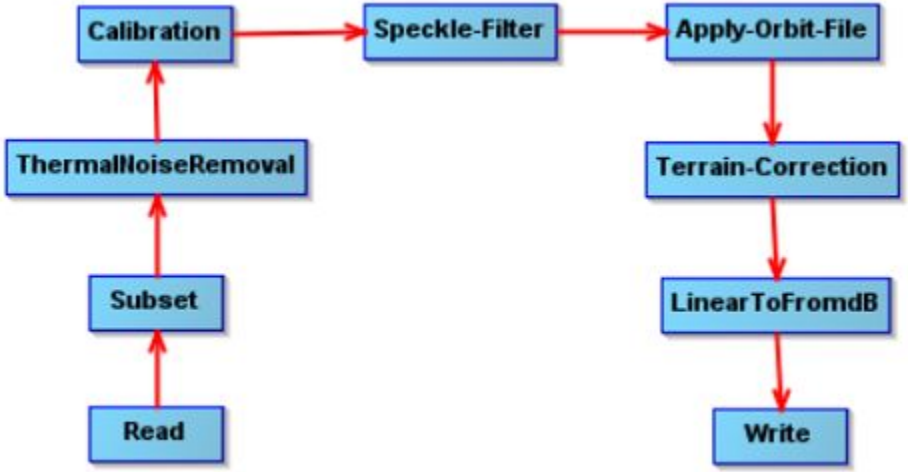
SAR Image Processing

Thresholding #3



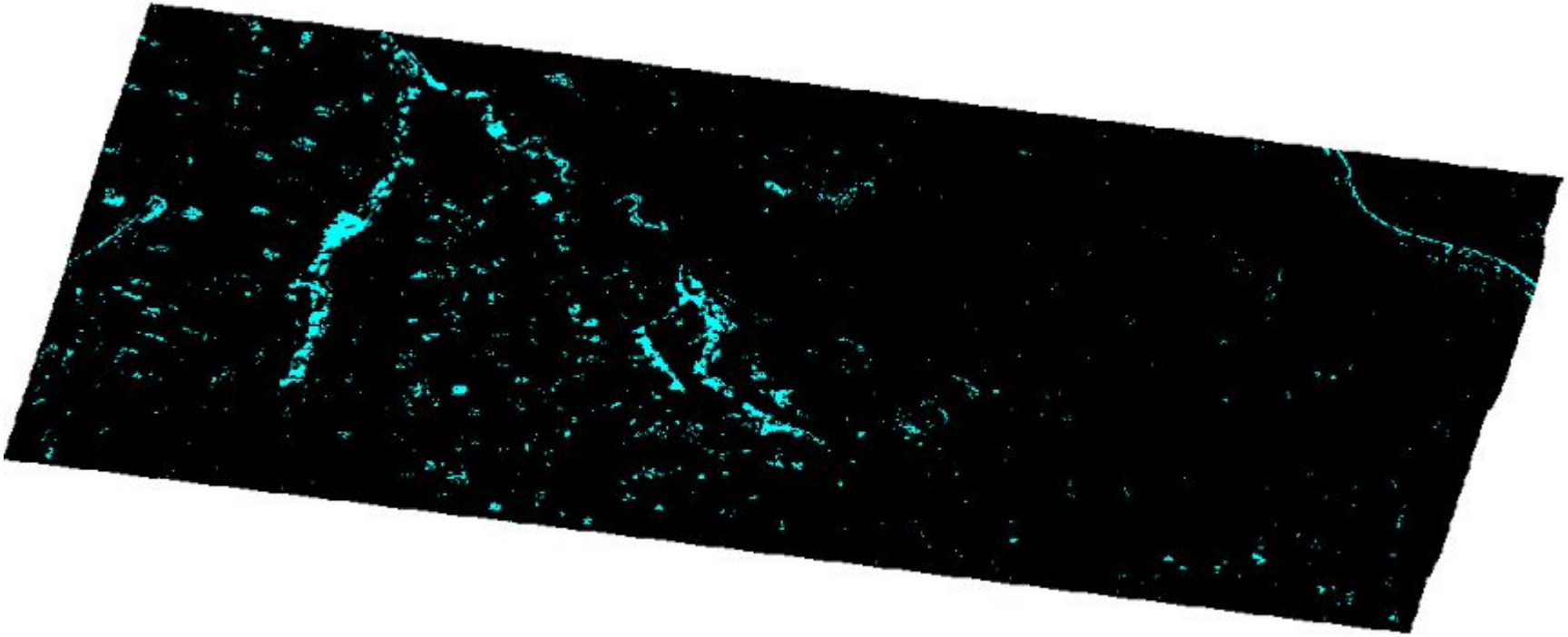
SAR Image Processing

Batch processing



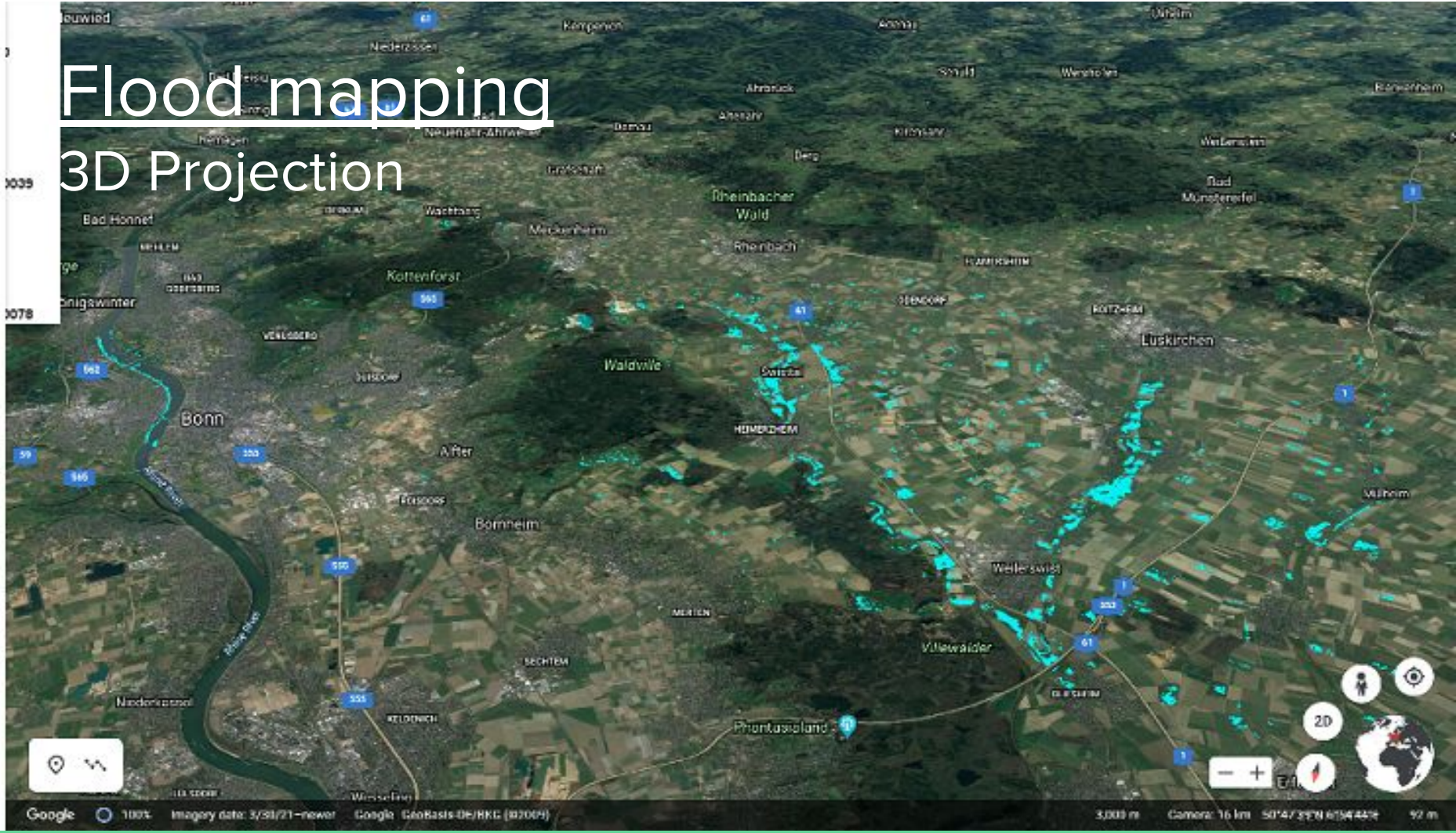
Flood mapping

flood = surface_water - water_bodies



Flood mapping

3D Projection

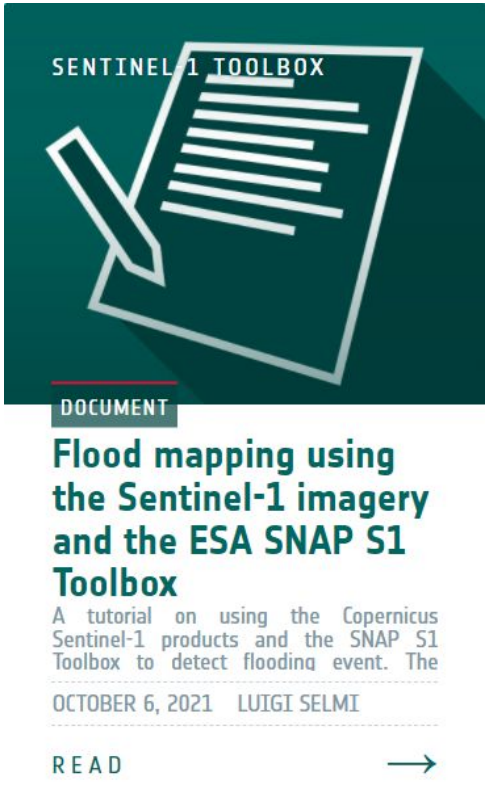


Conclusion

After one month of work:

Our tutorial “Flood mapping using the Sentinel-1 imagery and the ESA SNAP S1 Toolbox” has been included in the ESA STEP tutorials

58 positive reactions on LinkedIn by GIS and Remote Sensing specialists from all over the world



Next steps

Developing other tutorials to cover SAR interferometry and optical imagery from Copernicus Sentinel-2

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