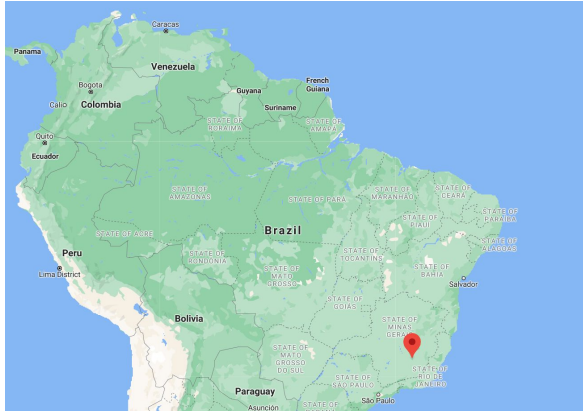


Bento Rodrigues dam collapse (2015)



Context

- 5th november 2015
- Collapse of the tailings dam at the Germano iron ore mine
- Causing a massive toxic mudflow
- 200 homes destroyed and 19 deaths
- Contamination upto the Atlantic ocean 620 km downstream



Source : Senado Federal,
[https://commons.wikimedia.org/wiki/File:Bento_Rodrigues_Mariana_Minas_Gerais_\(22828956680\).jpg](https://commons.wikimedia.org/wiki/File:Bento_Rodrigues_Mariana_Minas_Gerais_(22828956680).jpg)

Data availability

Exploration through GLOVIS

Criteria for the search :

- Before and after the event
- Low cloud cover

This returns two suitable images from LANDSAT 8 :

- Before image dating from 11 october 2015
- After image dating from 12 november 2015

Event spectral characteristics

- ❖ The mudflow is brown and is deposited by the flooding
 - Changes in reflectance in bands 4,3,2
- ❖ The mudflow is mostly water
 - Strong absorbance in IR, bands 5, 6, 7

Data exploration

Bands 4, 3, 2



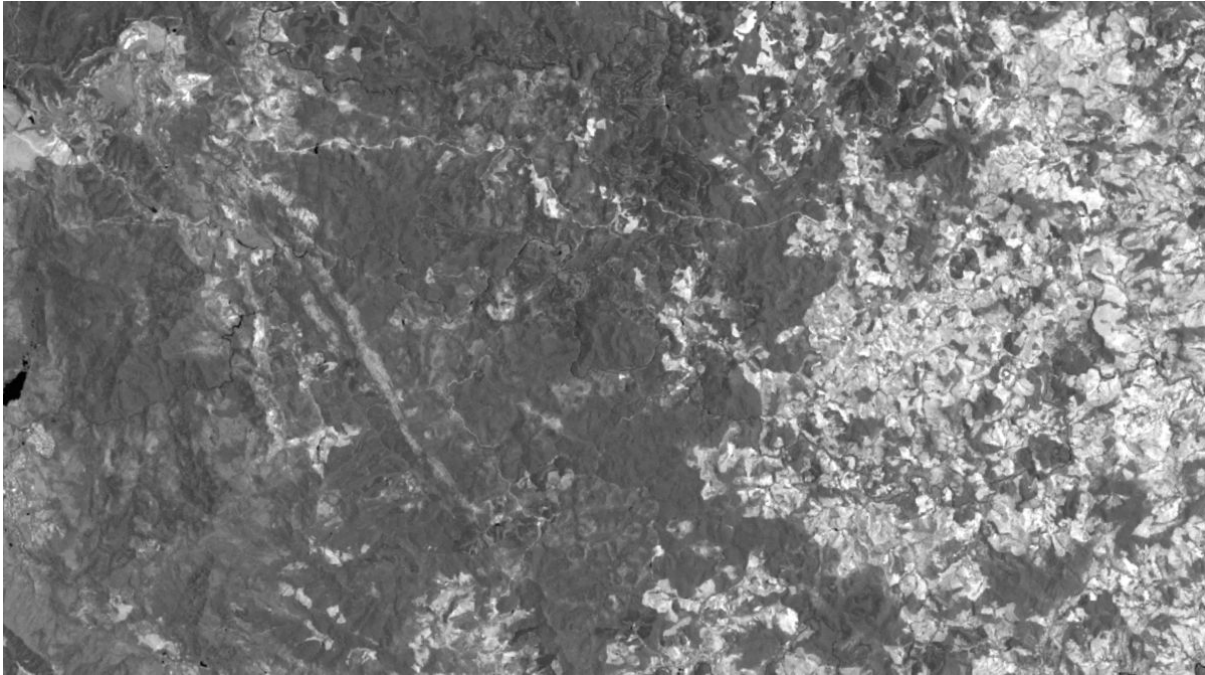
Data exploration

Band 5 : NIR



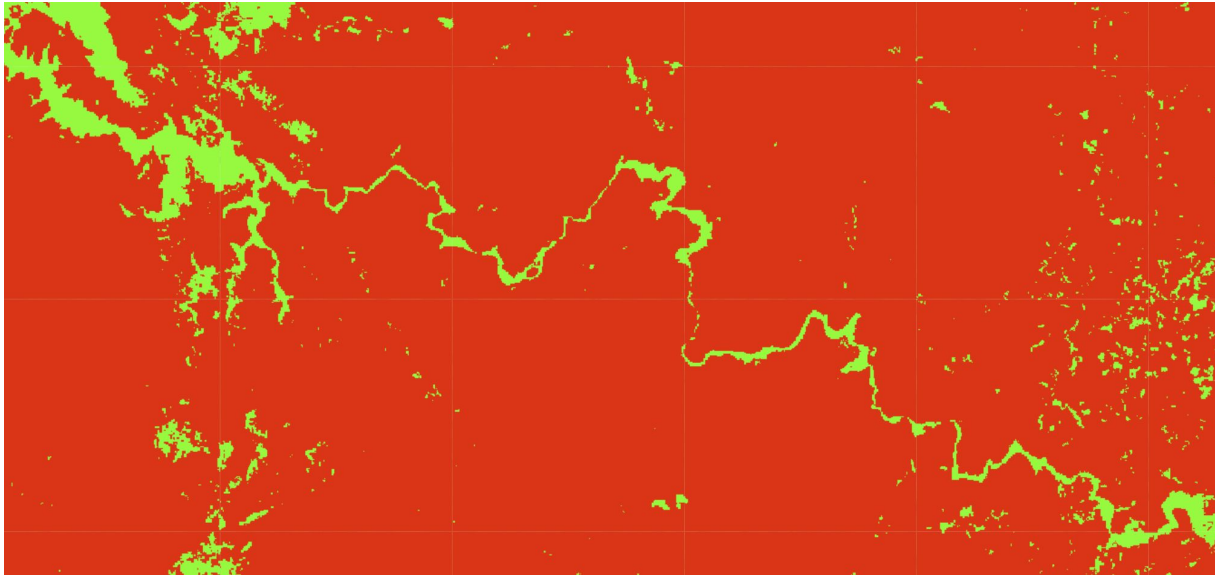
Data exploration

Band 6 : SWIR



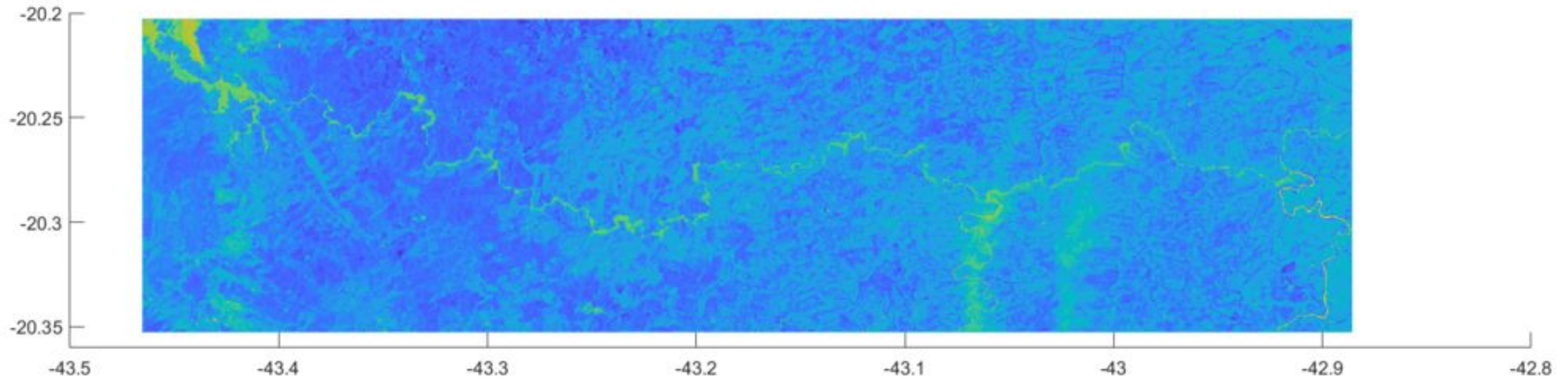
Possible methods

- Classifier



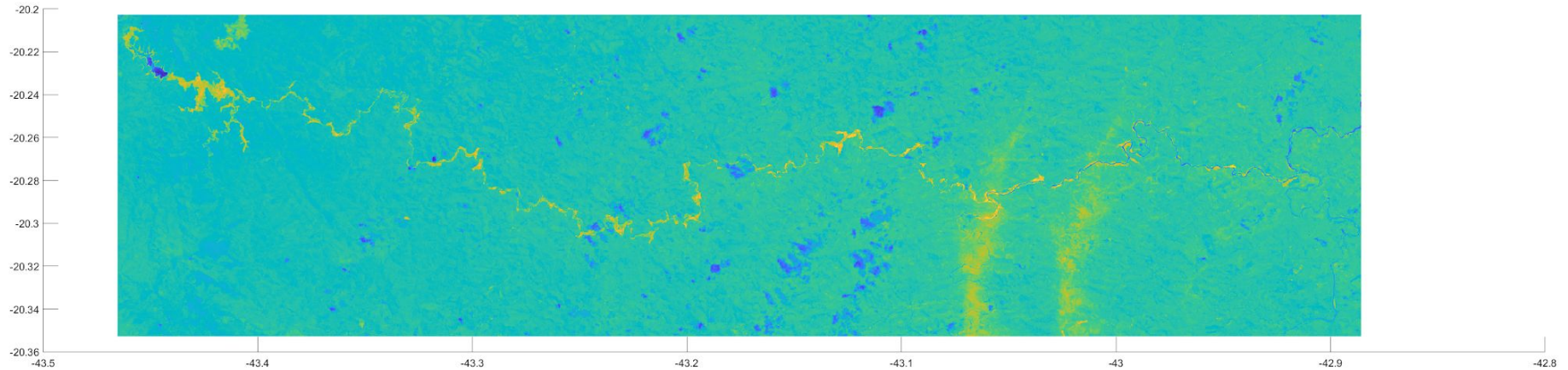
Possible methods

- NDWI using bands 5 and 3



Possible methods

- Difference on NDWI (B5, B3)



Possible methods

- Merging the difference on the NDWI with a DEM
- Adding per pixel constraints
 - Threshold on the NDWI difference +
 - Changes in B5 reflectance $\rightarrow B5_after < B5_before$
 - Manually selecting the zone of study
 - ...

Questions ?