Bento Rodrigues dam collapse (2015)

Remote Sensing (SA 2020)
Lucas Schmutz
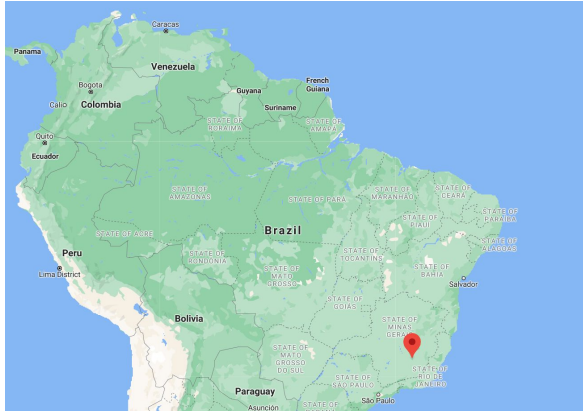
Context

- 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

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
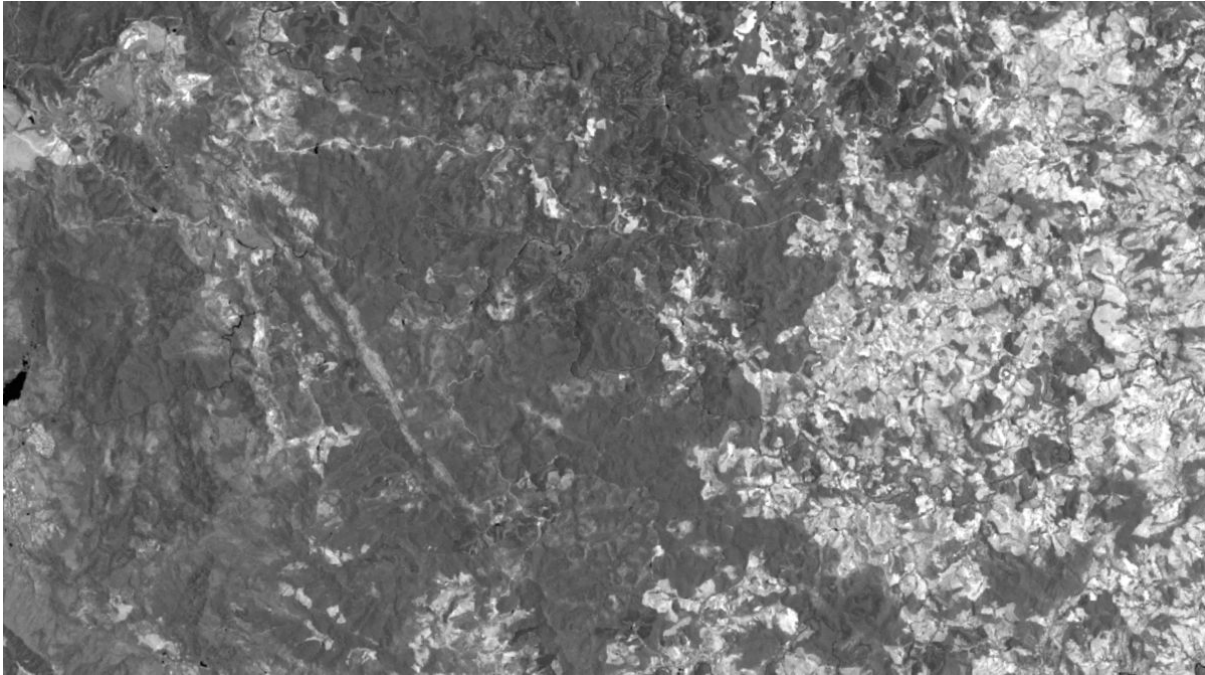
Data exploration

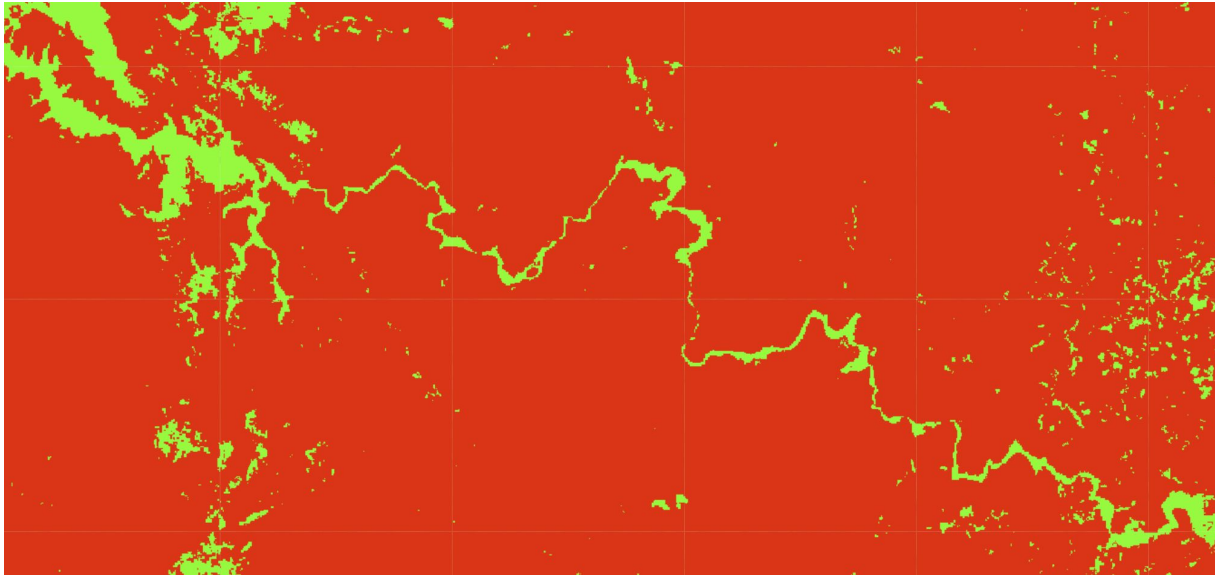Bands 4, 3, 2

Data exploration

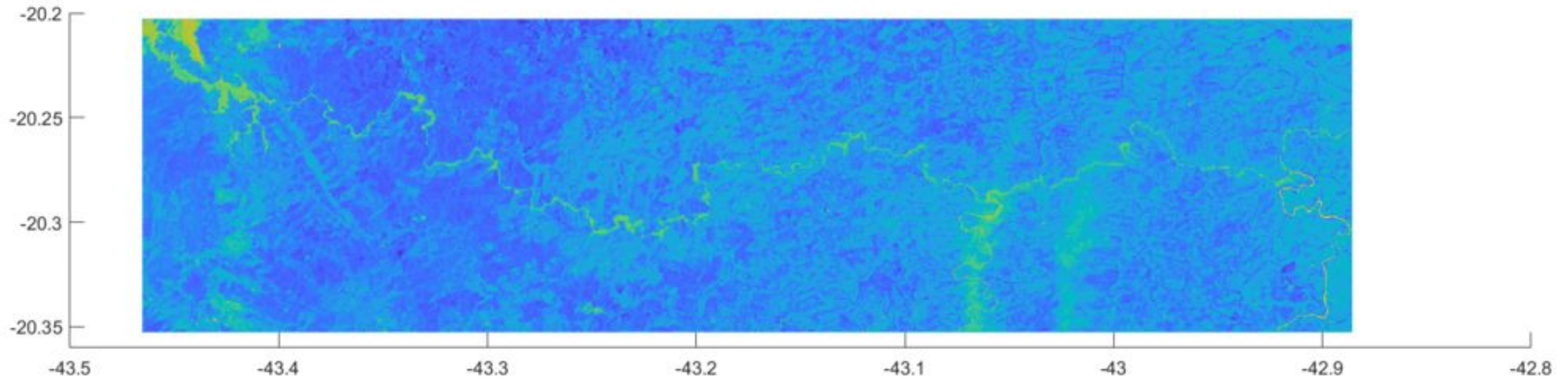Band 5 : NIR

Data exploration
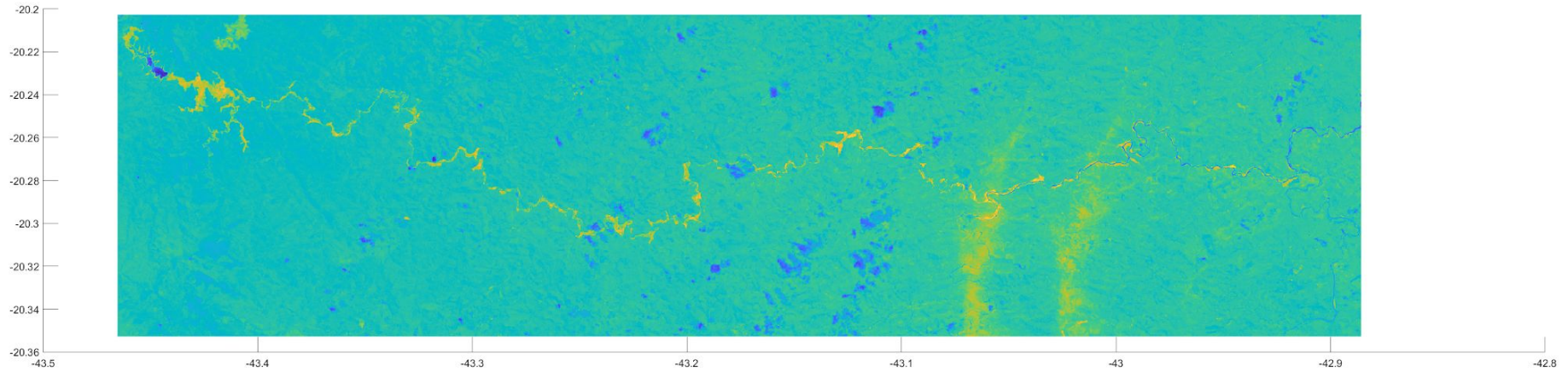
Band 6 : SWIR

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 → B5_after < B5_before
  - Manually selecting the zone of study
  - ...

Questions ?