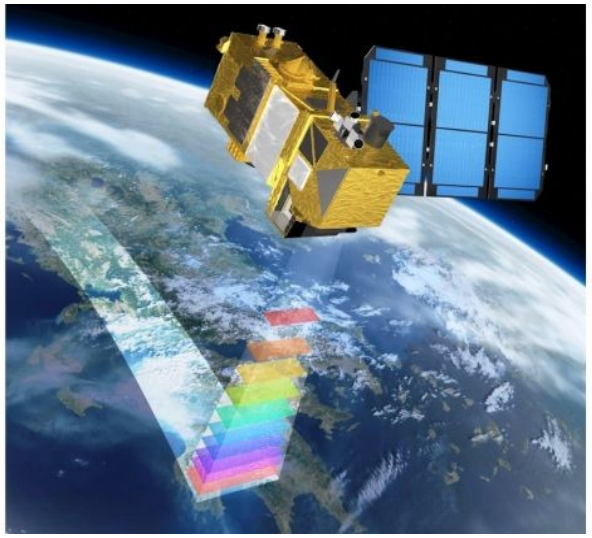
Multispectral indexes

Possible uses

Sentinel 2

- ESA – European Space Agency
  - 2 satellites
  - 10 days
- Data
  - Free, full and open access



Data

- 13 bands
  - Different wavelengths
  - Different resolutions
- Combination of bands
  - Multispectral indexes

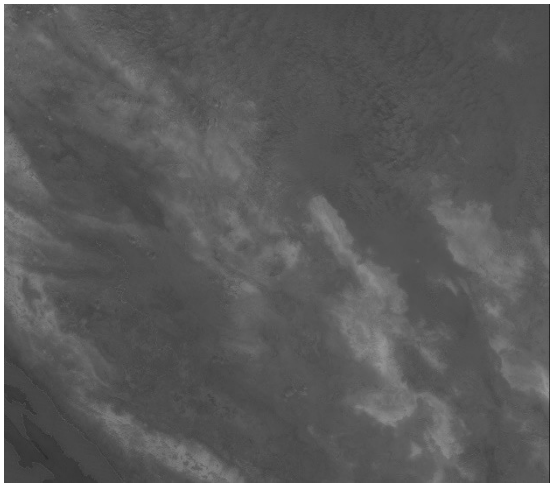
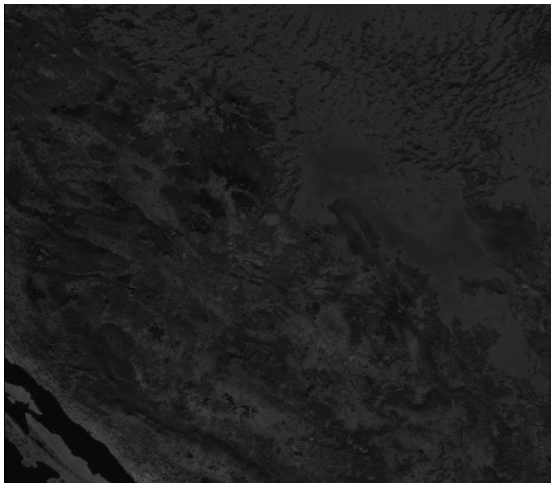
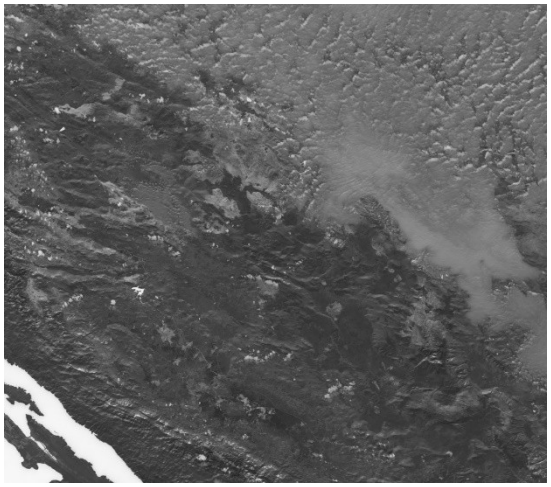
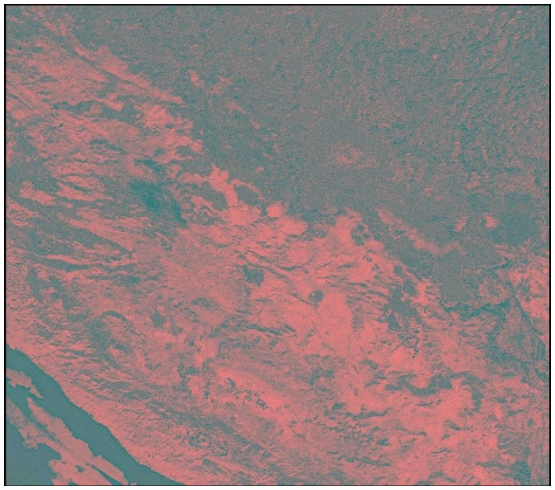
Sentinel-2 Bands	Central Wavelength (µm)	Resolution (m)
Band 1 - Coastal aerosol	0.443	60
Band 2 - Blue	0.490	10
Band 3 - Green	0.560	10
Band 4 - Red	0.665	10
Band 5 - Vegetation Red Edge	0.705	20
Band 6 - Vegetation Red Edge	0.740	20
Band 7 - Vegetation Red Edge	0.783	20
Band 8 - NIR	0.842	10
Band 8A - Vegetation Red Edge	0.865	20
Band 9 - Water vapour	0.945	60
Band 10 - SWIR - Cirrus	1.375	60
Band 11 - SWIR	1.610	20
Band 12 - SWIR	2.190	20

Multispectral indexes

- Examples

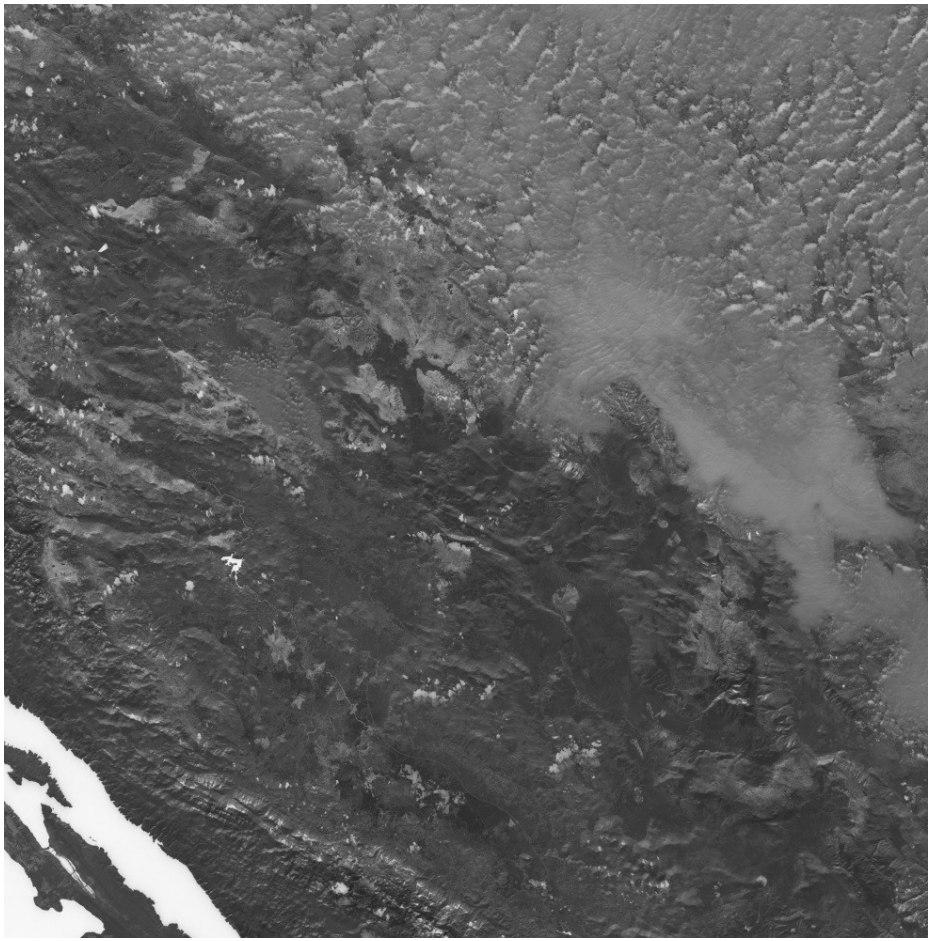
Name	Definitions
Enhanced vegetation index	$EVI = \frac{\vec{s}[8] - \vec{s}[4]}{\vec{s}[8] + 6\vec{s}[4] - 7.5\vec{s}[2] + 1}$
Normalised difference vegetation index	$NDVI = \frac{\vec{s}[8] - \vec{s}[4]}{\vec{s}[8] + \vec{s}[4]}$
Green normalised difference vegetation index	$GNDVI = \frac{\vec{s}[8] - \vec{s}[3]}{\vec{s}[8] + \vec{s}[3]}$
Moisture stress index	$MSI = \frac{\vec{s}[11]}{\vec{s}[8]}$
Normalised difference water index	$NDWI = \frac{\vec{s}[3] - \vec{s}[11]}{\vec{s}[3] + \vec{s}[11]}$
Normalised difference built-up index	$NDBI = \frac{\vec{s}[11] - \vec{s}[8]}{\vec{s}[11] + \vec{s}[8]}$
Normalised difference mud index	$NDMI = \frac{\vec{s}[9] - \vec{s}[8]}{\vec{s}[9] + \vec{s}[8]}$

Multispectral indexes

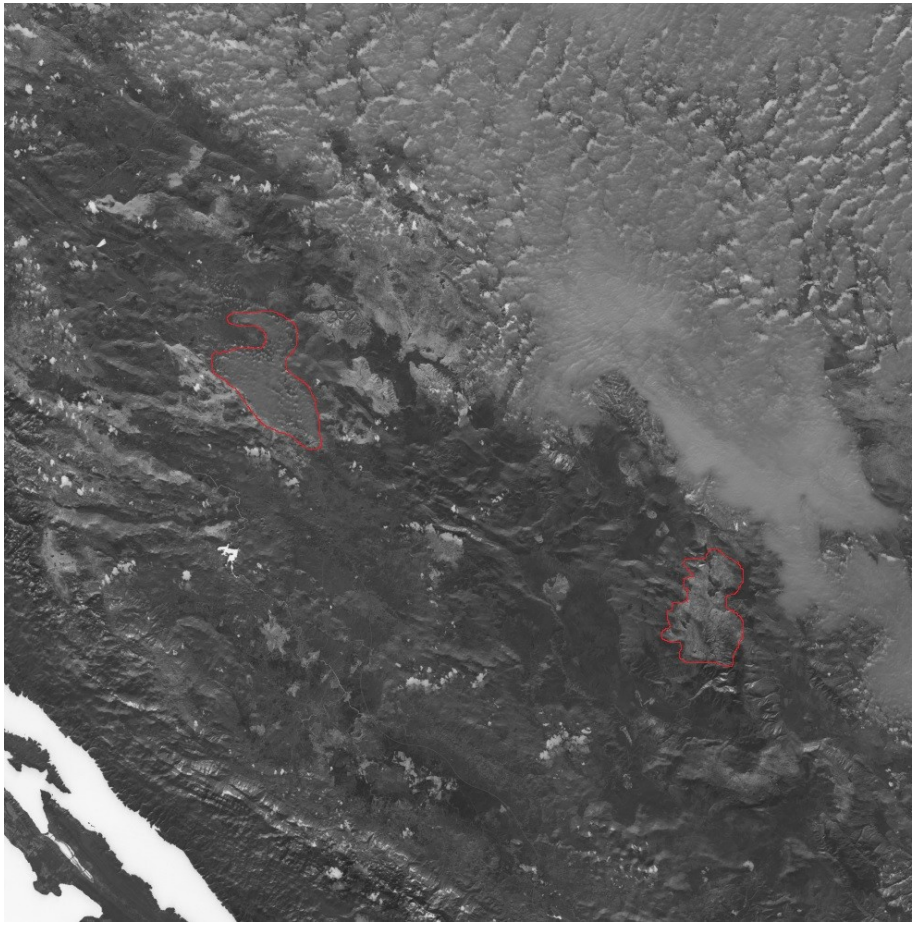
Uses

- NDWI - Normalized Difference Water Index
  - Crop health monitoring
  - Water content of leaves
  - Water content in water bodies



Possible uses

- Symmetry of different patterns recognized from the indexes
- Interpretation of results



Possible uses

- Mathematical models for prediction of:
  - Fire progress
  - Crop health
  - …