AOA WEBINAR 1
Overview of the Olive Remote Sensing Project

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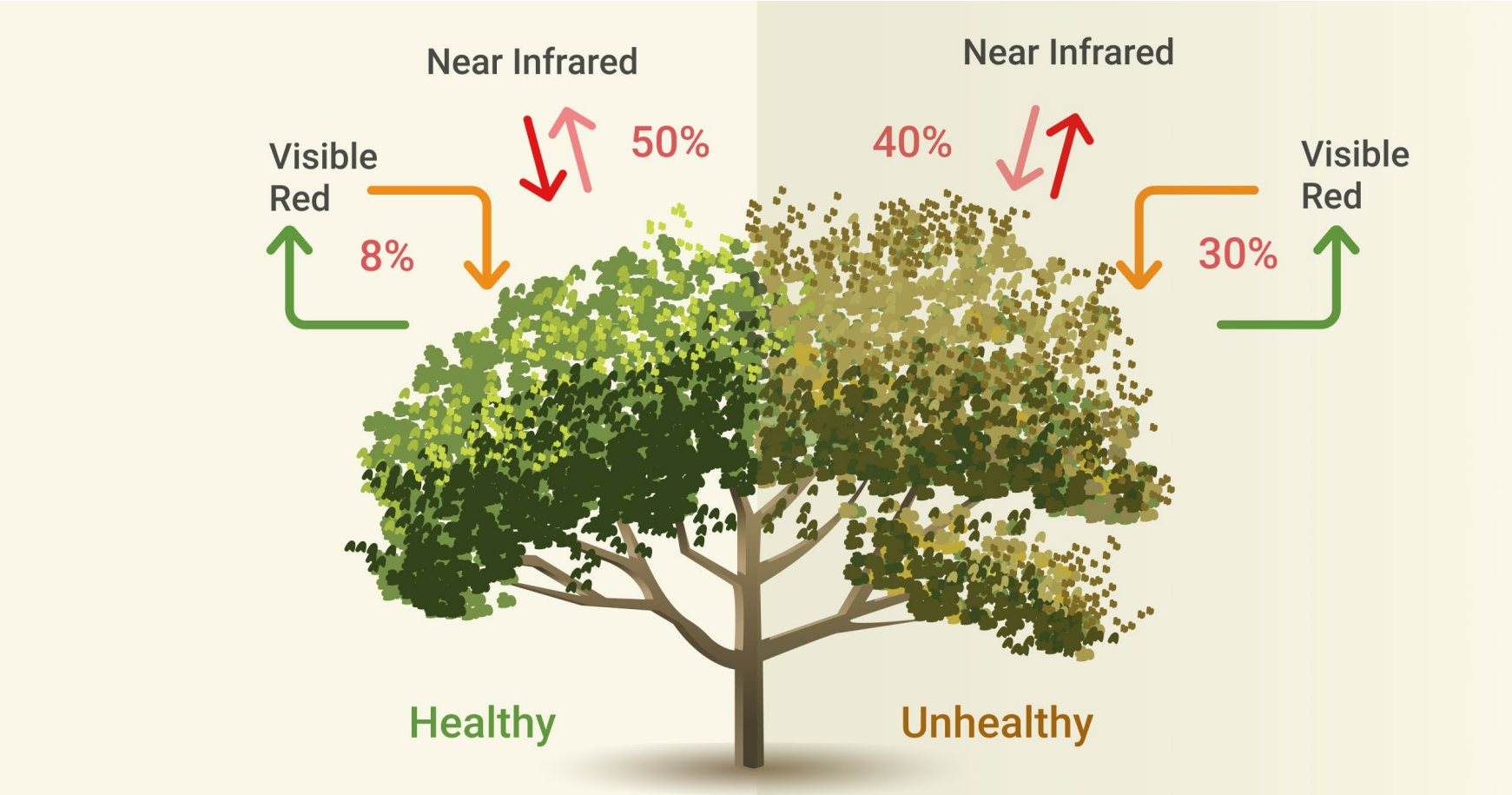
Applied Agricultural Remote Sensing Centre

Principles of reflectance of green vegetation



$$\frac{0.50-0.08}{0.50+0.08}=0.72$$

NDVI

$$\frac{0.4-0.3}{0.4+0.3}=0.14$$

NDVI: is a good indicator of tree vigour (size and health).
However, other Vis may be better correlated to the parameters you are interested in.

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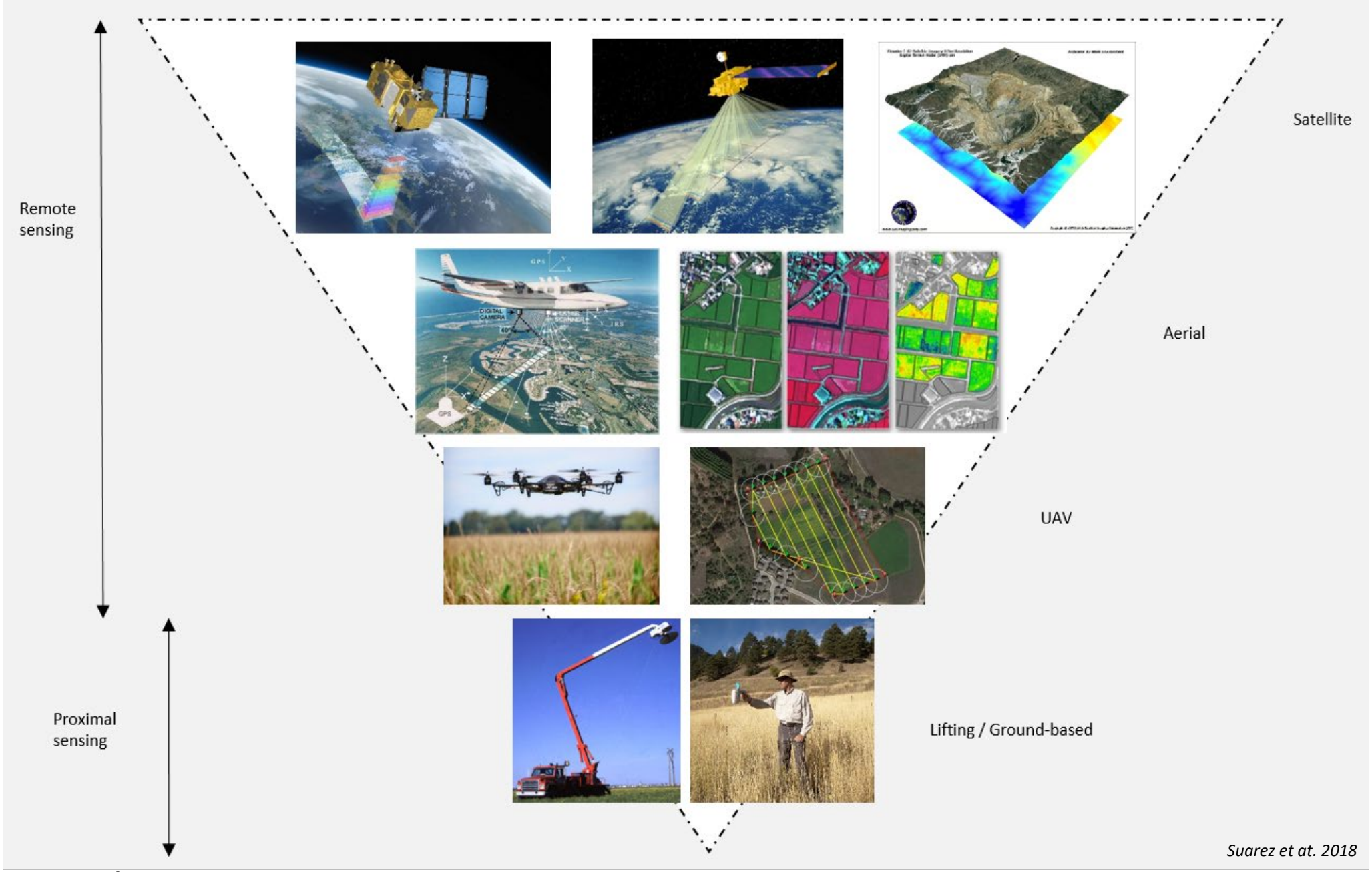


Remote/Proximal Sensing Technologies

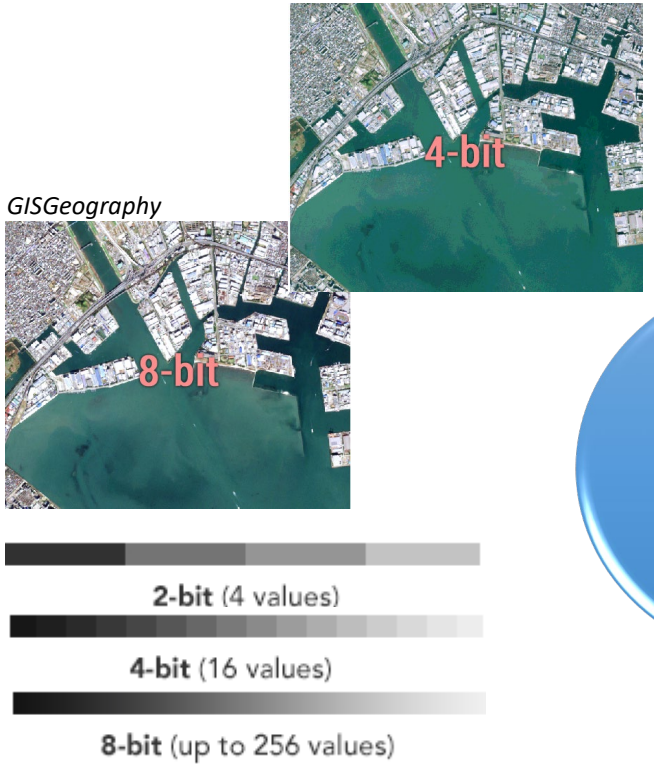
Satellites


OSTM/Jason 2
(NOAA)
Aquarius
QuikSCAT
TRMM
Terra
ISS-RapidScat,
CATS
EO-1
Landsat 7
(USGS)
SMAP
Aqua
Suomi NPP
(NOAA)
Landsat 8
(USGS)
SORCE,
TCTE (NOAA)
Aura
GPM
GRACE (2)
CALIPSO
CloudSat
OCO-2
NASA

Comparison of relevant satellite platforms for Ag.

	Satellite Sensor					
	WV-3	**Sentinel-2**	**Geo-Eye -1**	**Planet**	**Spot 6-7**	**Landsat 8-OLI**
Revisit time	> 5 days	5 days	> 3 days	1-2 days	As required	16 days
Pancromatic Resolution	0.31m	N/A	0.46m	N/A	1.5m	15m
Multispectral Resolution	1.24m	10m, 20m and 60m	1.84m	3m	6m	30m
Number of Multispectral Bands	8 (16 with SWIR)	13	4	4	4	10
Cost	~$5.50/ha	Free	~$3/ha	TBA	~$0.18/ha	Free

Sensor resolutions



GISGeography

Spatial

Pixel size

Radiometric

Data sensitivity

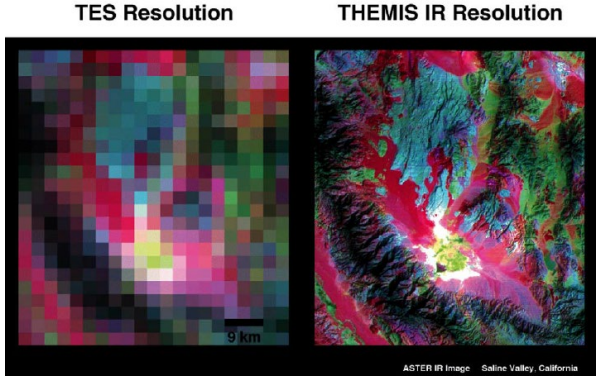
Purpose

Temporal

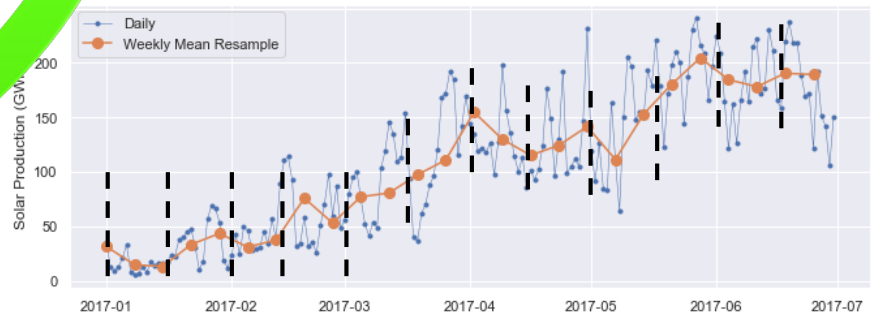
Frequency of image acquisition

Spectral

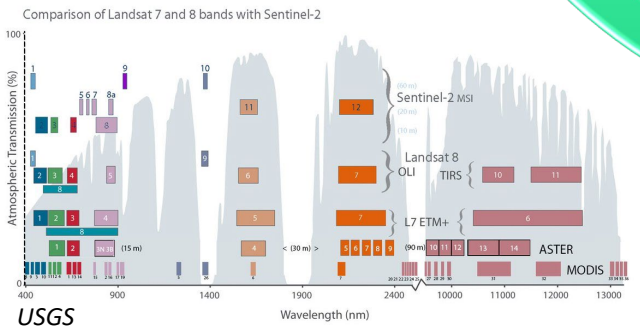
Number and width of wavelengths



Christensen et al 2004

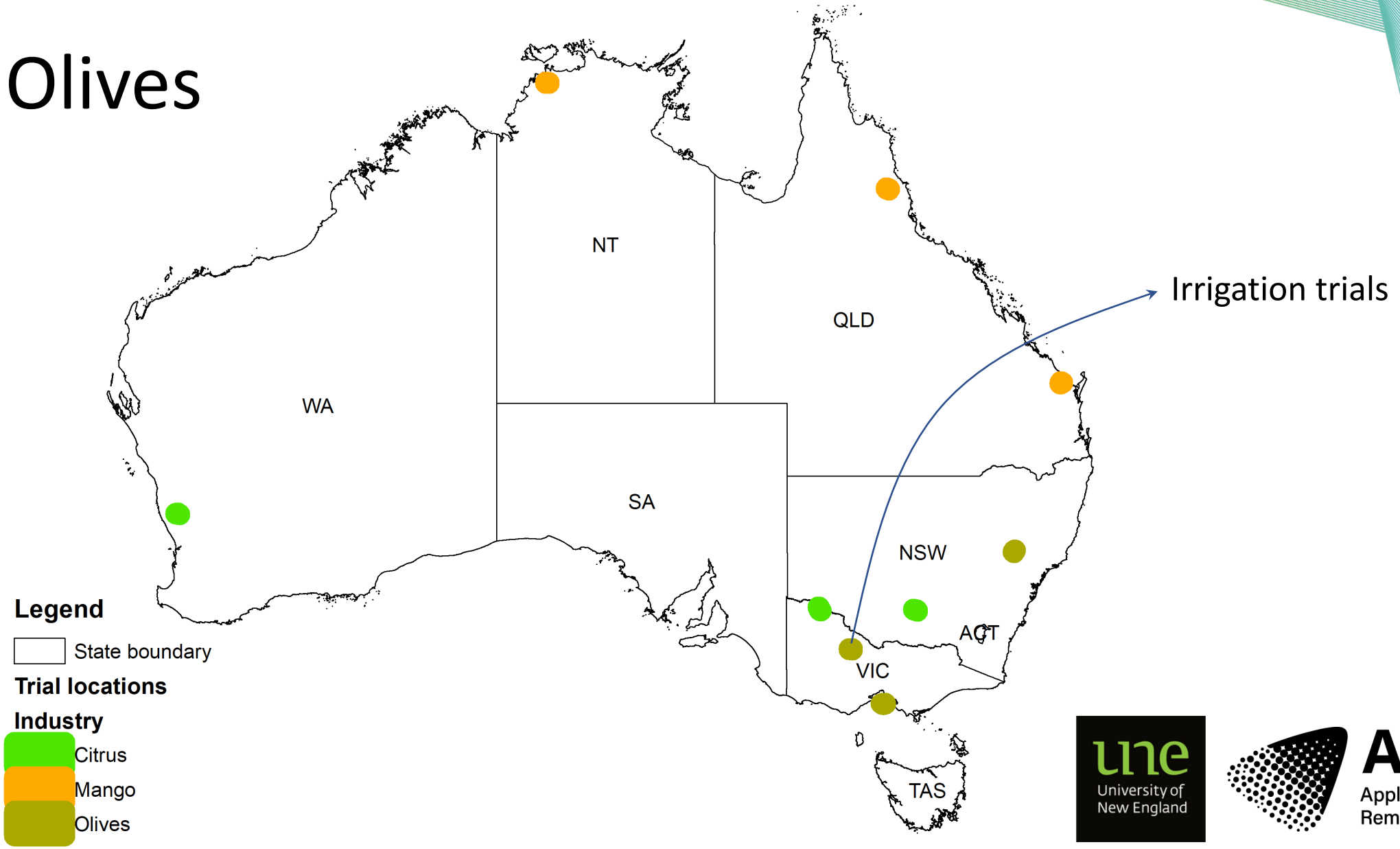


https://www.dataquest.io/blog/tutorial-time-series-analysis-with-pandas/



USGS

Olives



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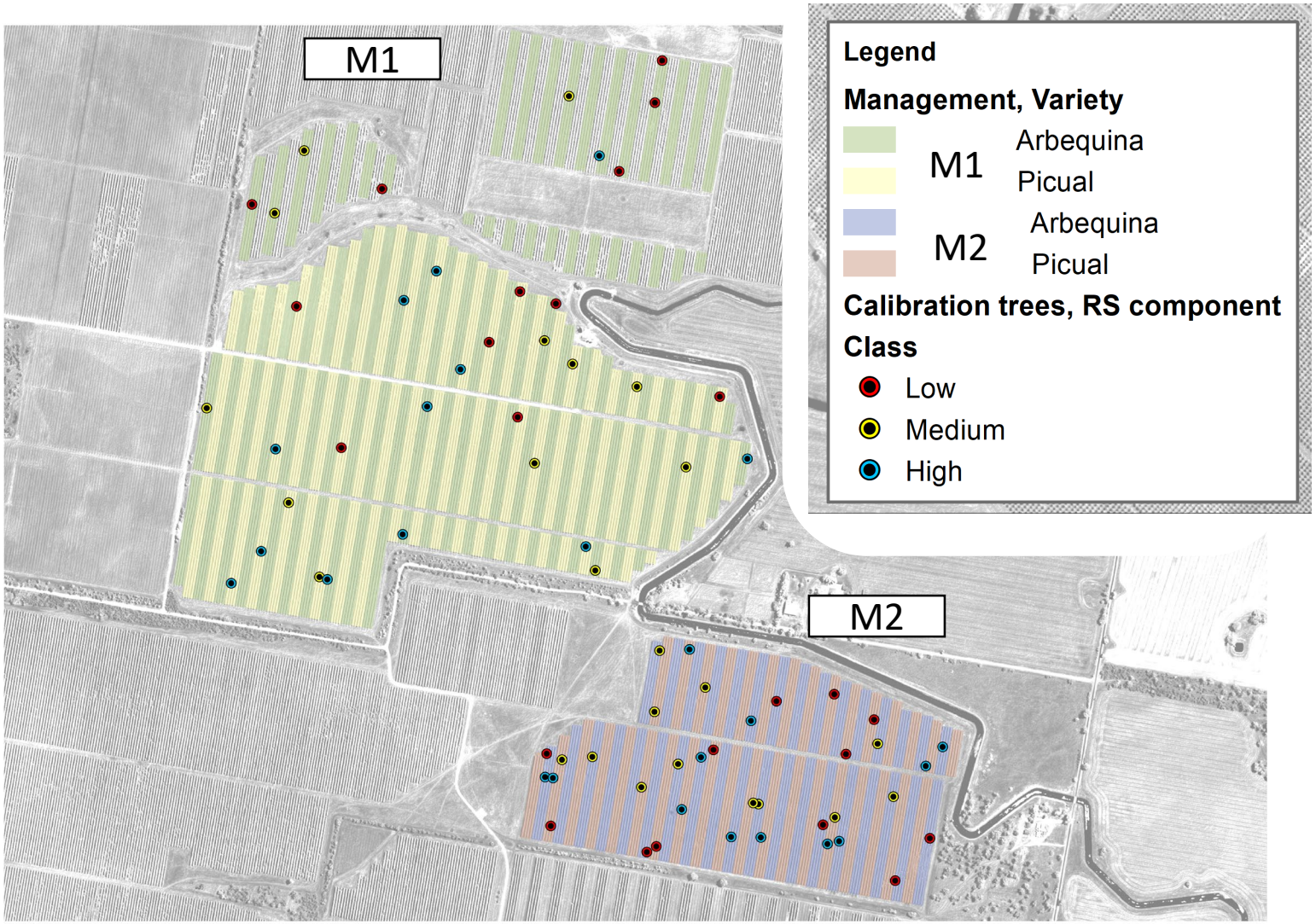
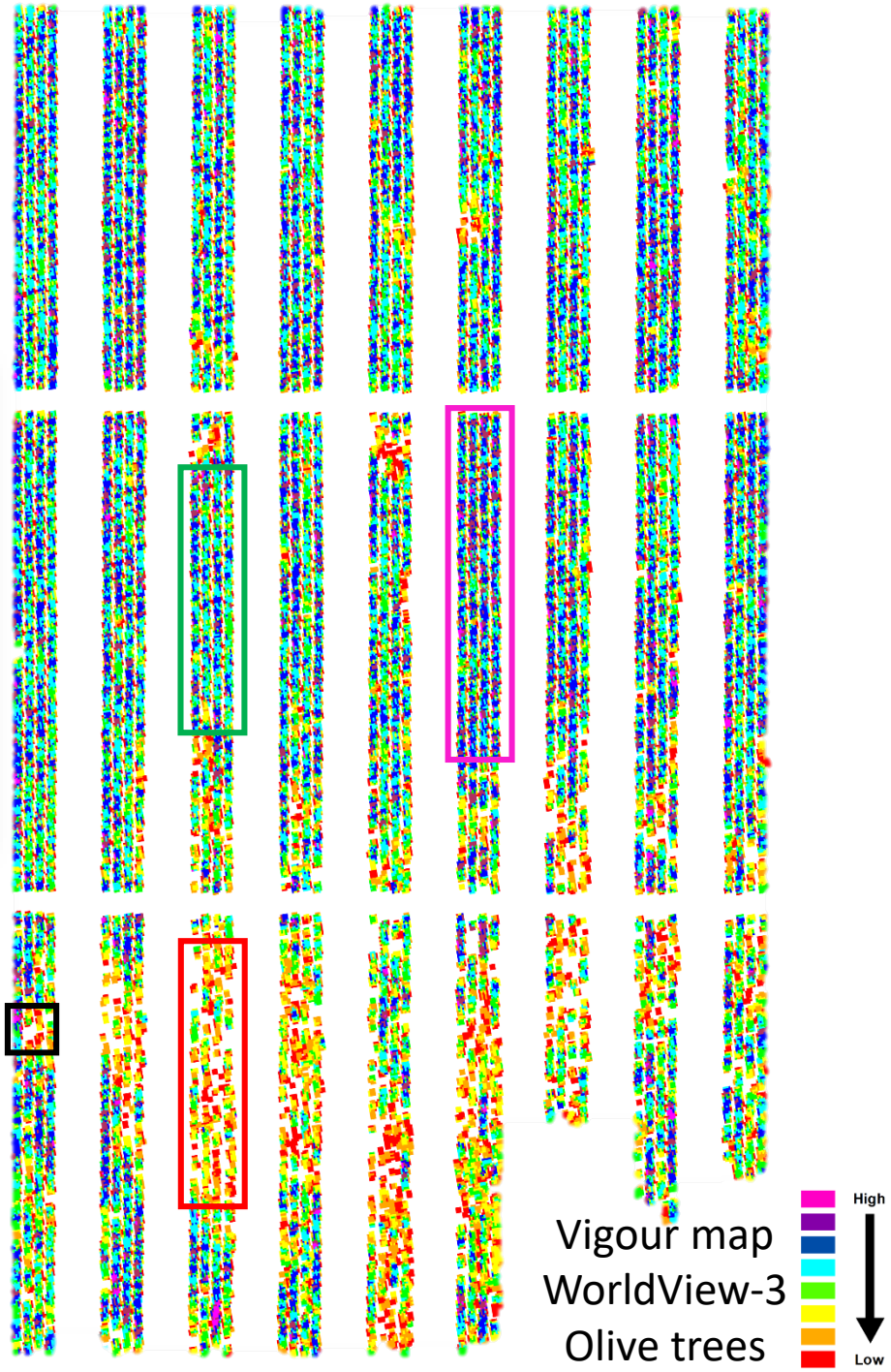
Remote sensing component

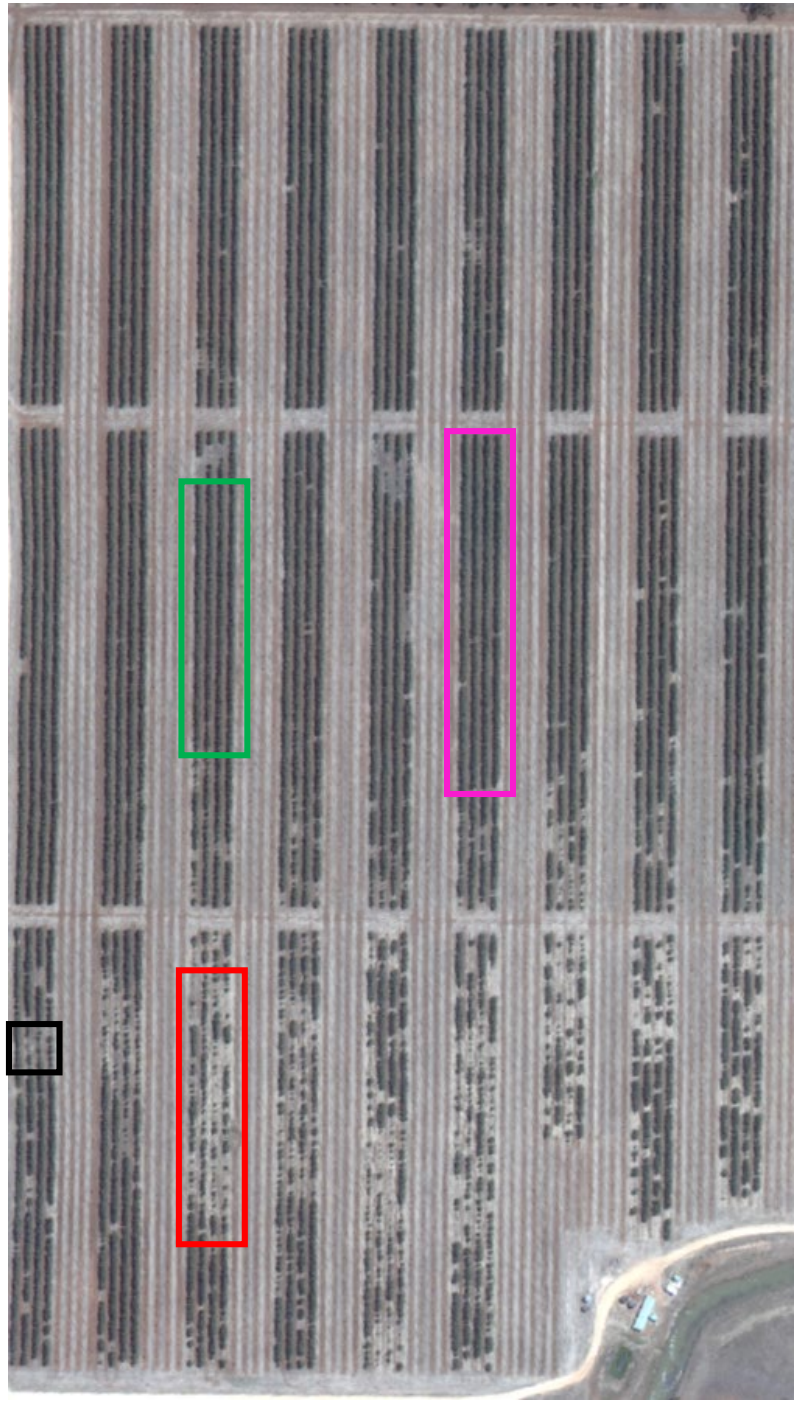
Assessment of:

- Vigour variability
- Oil content & quality
- Yield variability

- Using different platforms:
  - Satellite
  - Airborne
- and sensors
  - Reflectance based
  - Thermal imagery




Vigour map
WorldView-3
Olive trees
High
Low



Planet (satellite)
3 m spatial resolution
Temporal analysis

Airborne
~ 0.5 m
Spatial resolution
Includes thermal
Sensor, easy to
deploy

Worldview 3
~ 0.3 m – 1.2 m
Spatial resolution,
Best calibrated source
More spectral bands, more VIs
available

Sensors & Platforms