CASIDAS Atmospheric Correction code

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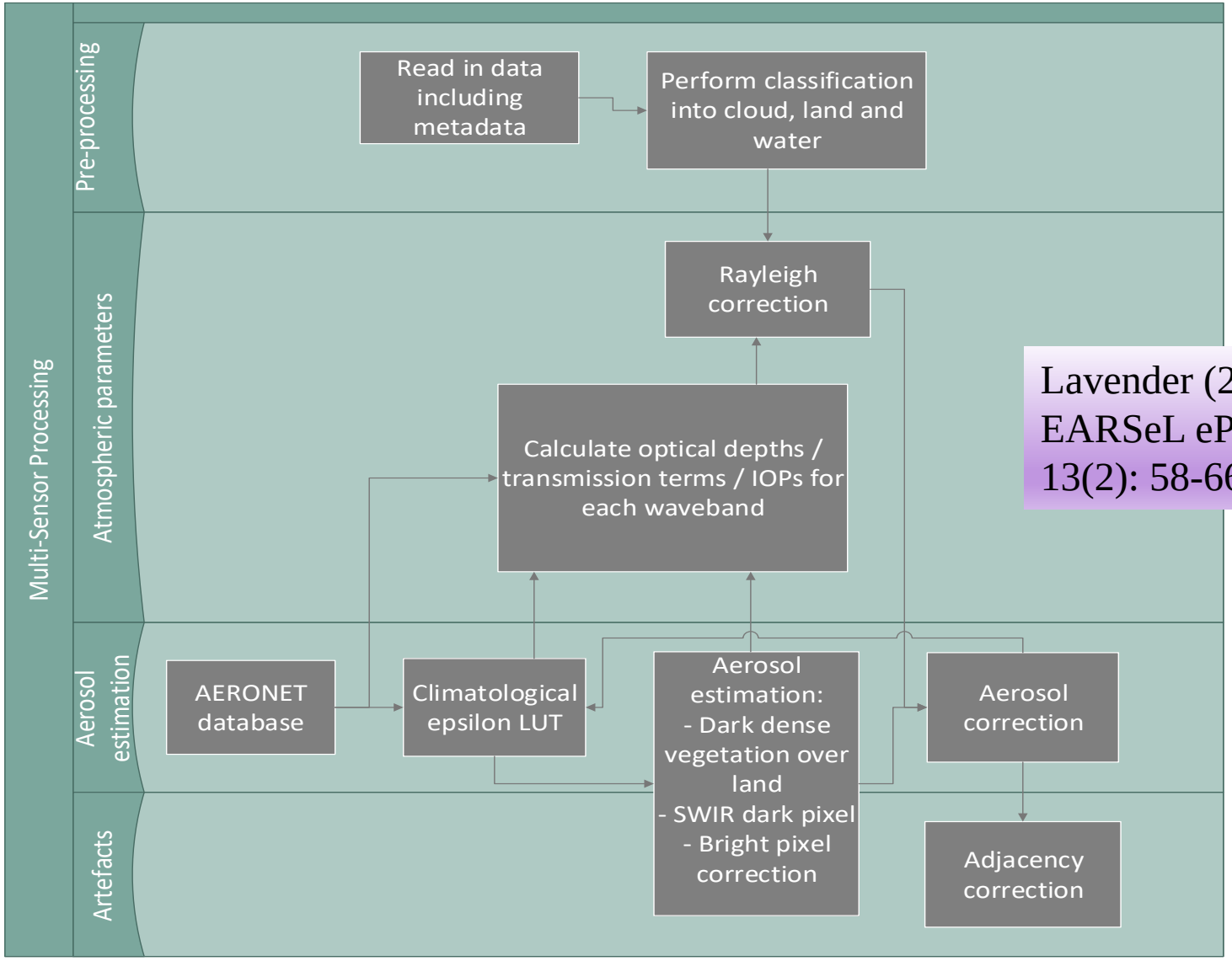
A brief history

Originally developed as part of Dr Lavender's PhD, and then developed/published with different foci:

- **Further developed for CASI airborne data, name inspired by SeaDAS:** Lavender and Nagur (2002) Mapping coastal waters with high resolution imagery: atmospheric correction of multi-height airborne imagery, Journal of Optics A: Pure and Applied Optics 4 (4), S50
- **Extension to SeaWiFS & MERIS:** Lavender *et al.* (2005) Modification to the atmospheric correction of SeaWiFS ocean colour images over turbid waters, Continental Shelf Research 25 (4), 539-555
- **Extension to HICO:** unpublished
- **Extension to Landsat missions:** Lavender (2014). Multi-sensor ocean colour atmospheric correction for time-series data: Application to LANDSAT ETM+ and OLI data, EARSeL eProceedings, 13(2): 58-66.
- **Extension to missions such as Kompsat, and applied in terrestrial environments:** Lavender (2016) Monitoring Land Cover Dynamics at Varying Spatial Scales Using High to Very High Resolution Optical Imagery, Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci
- **Extension to Sentinel-2 & -3**

Atmospheric Correction – modular approach



Lavender (2014), EARSeL eProceedings, 13(2): 58-66.

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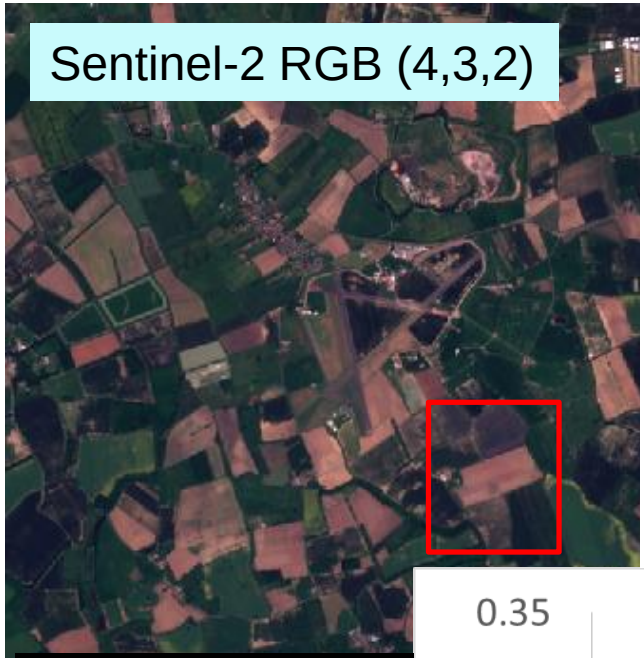
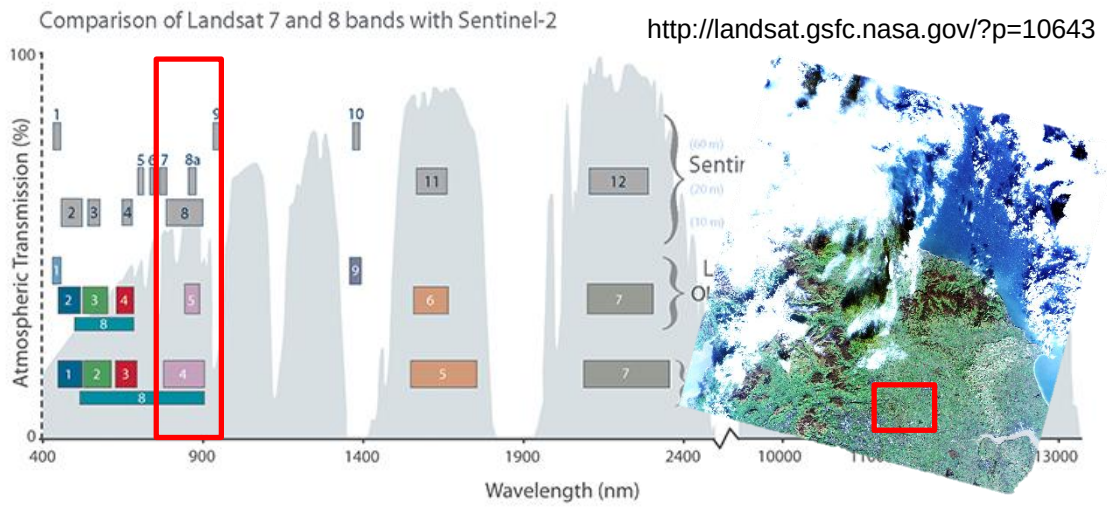
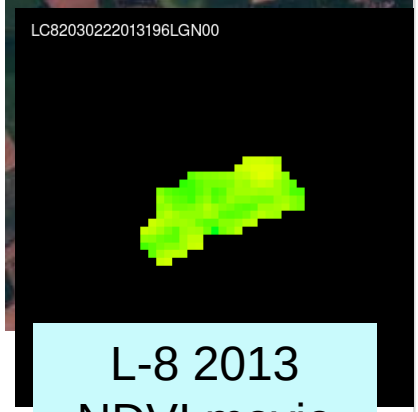
Landsat-8 & Sentinel-2 additions

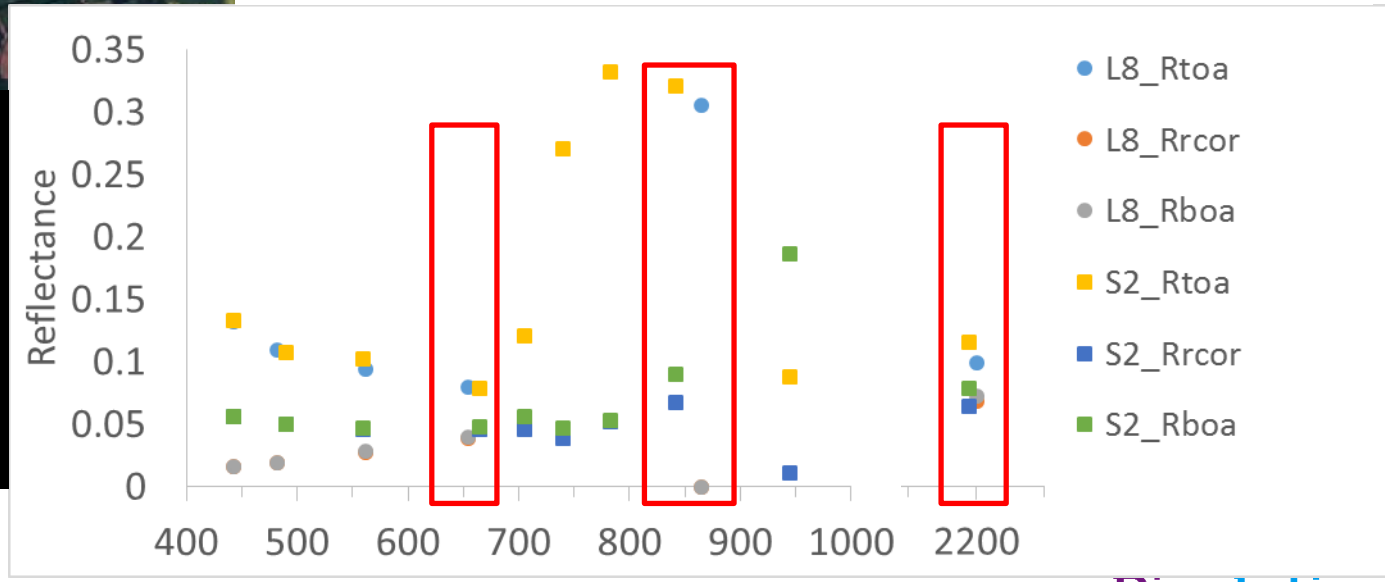
- Use of SeaDAS to:
  - Download / provide the ancillary information: atmospheric pressure, water vapour, humidity, ozone and surface height
  - Calculate the OLI sensor geometry, provide multi-scattering Look-Up-Table based Rayleigh calculation and NASA's OLI vicarious calibration coefficients
- Clouds: Assumed to be high concentration aerosols, with option to remove pixels that have been identified as clouds (conservative approach) during the classification step
- Option of additional adjustment to reduce negative reflectances

Landsat-8 & Sentinel-2 processing









Interest to be involvement in ACIX-2

- Recent research on CASIDAS has focused on robustness rather than primarily scientific accuracy – code is primarily run within automated processing workflows
- Extended to be used over terrestrial as well as marine environments, but not all corrections currently included, and remains relatively simplistic in it's overall approach
- Interest to know how it compares to more recent code / different approaches

Landsat-8 data courtesy of the USGS/NASA and Sentinel-2 courtesy of ESA/EC Copernicus programme.

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