Analyzing Satellite Images With Python Scientific Stack

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About Me

- Name is hard to spell and pronounce
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Python Scientific Stack

- python, numpy, scipy, scikit-image, scikit-learn
- Pros:
    - Free
    - Not bindings to C-libraries
    - Easy to read algorithms
- Cons:
    - Single-threaded
    - Memory hungry
    - uint16 not fully supported

Landsat 8

- Launched in 2013
- Life span of 5 years
- Heliosynchronous orbit
- Altitude 710 km (440 mi)
- Satellite orbits Earth every 99 minutes

Landsat 8 Data Acquisition

- 400 GB of data, 400 scenes every day
- Each scene is 185 x 170 km (115 x 105 mi)
- Data recorded in midmorning hours
- Images captured between 82° 40’ N/S latitudes
- Same scene captured every 16 days

Landsat 8 Imagers

- Operational Land Imager - OLI:
  - 9 bands in violet to short infrared range
  - Resolution 15 - 30 meters
- Thermal Infrared Imaging Sensor - TIRS:
  - Two bands in long infrared range
  - Resolution 100 meters, interpolated to 30 meters

Landsat 8 Data Store

- Data curated by US Geological Survey
- Freely available for download upon registration
- Level 1 data is terrain corrected
- Data is available as 16-bit grayscale geotifs

IPython Notebook time!