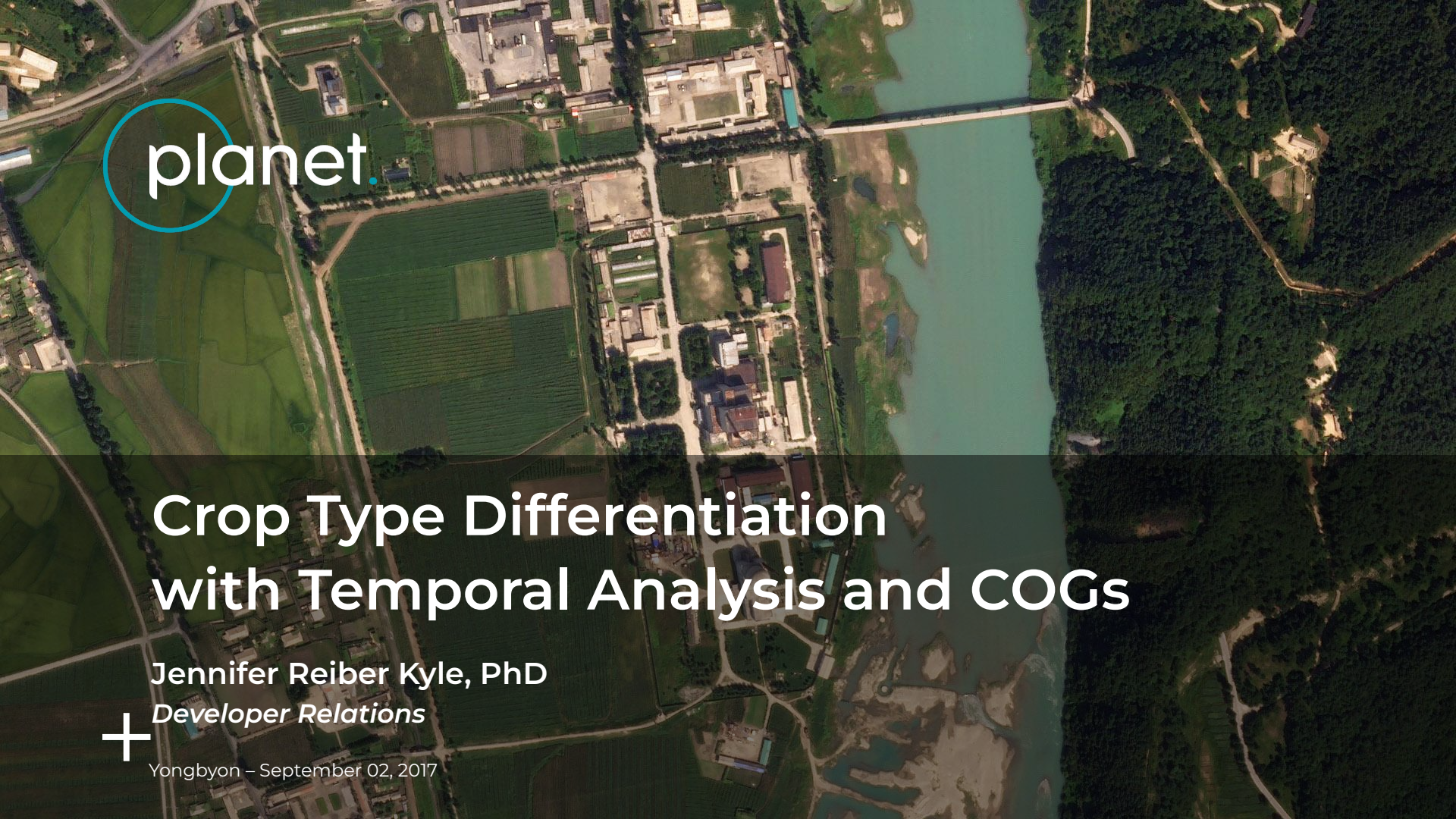


Crop Type Differentiation with Temporal Analysis and COGs

Jennifer Reiber Kyle, PhD
Developer Relations

Yongbyon – September 02, 2017

Identify Crops From Space!

The Promise:

- Crop inventory -> food security
- Satellite imagery -> quick, cheap

The Problem:

- Similar spectral signatures
- Hard to differentiate in one snapshot

The Solution:

- Temporal analysis ->temporal-spectral signature

Project

Goal:

- Is this possible?
- How difficult?

Methods:

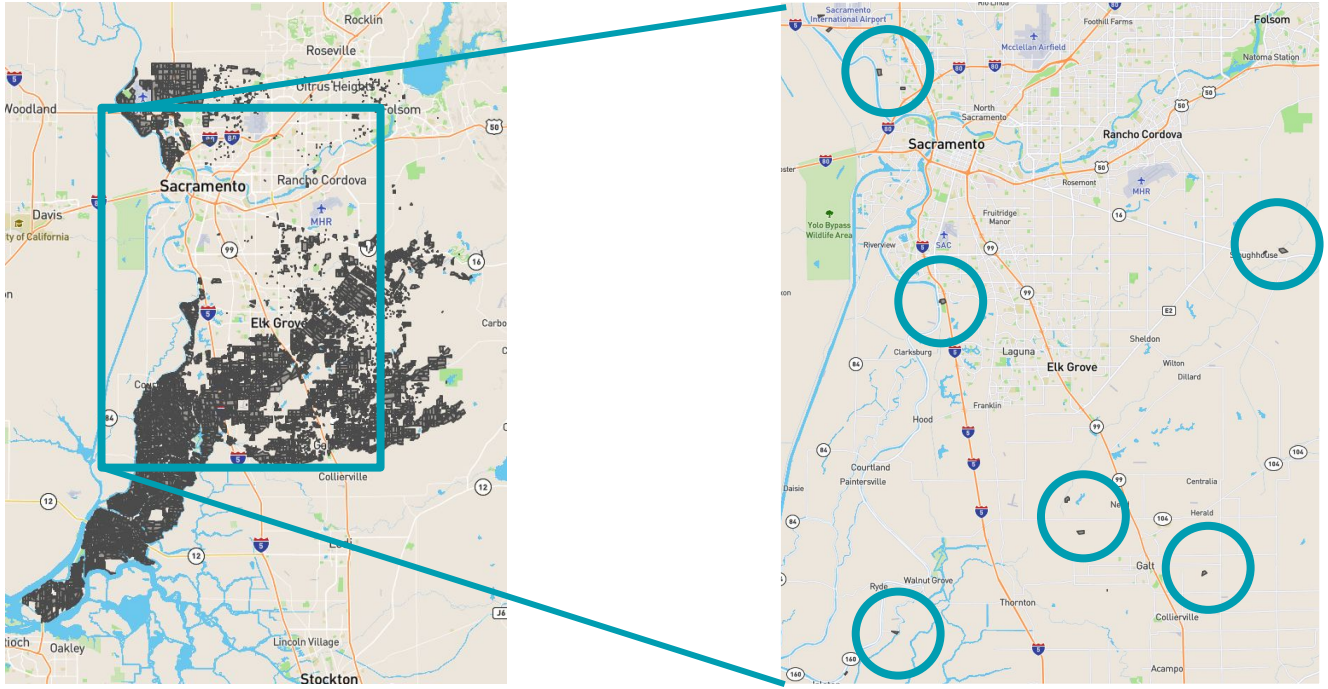
- Ground truth data - 3 x 5 features, 2015
- Imagery - 50 scenes, July-Sept 2017

Background:

- Originally performed in 2017
- Used v1 of the planet sdk for python
- Used top-of-atmosphere product
- Took 2.5 hours to process,

Ground Truth

2015 survey in Sacramento County, CA



Full dataset

Selected Fields

Imagery
2017 PlanetScene surface reflectance 4Band

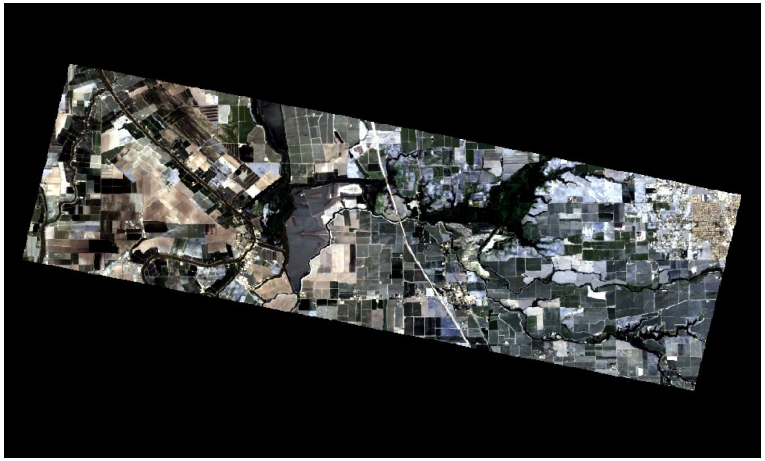
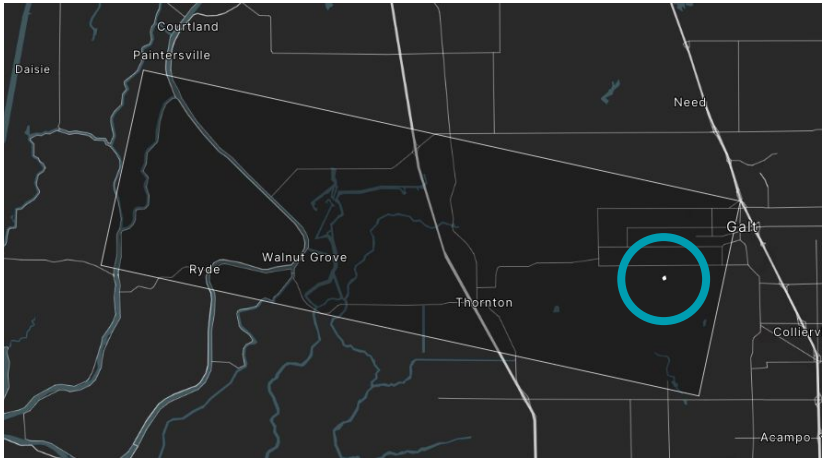


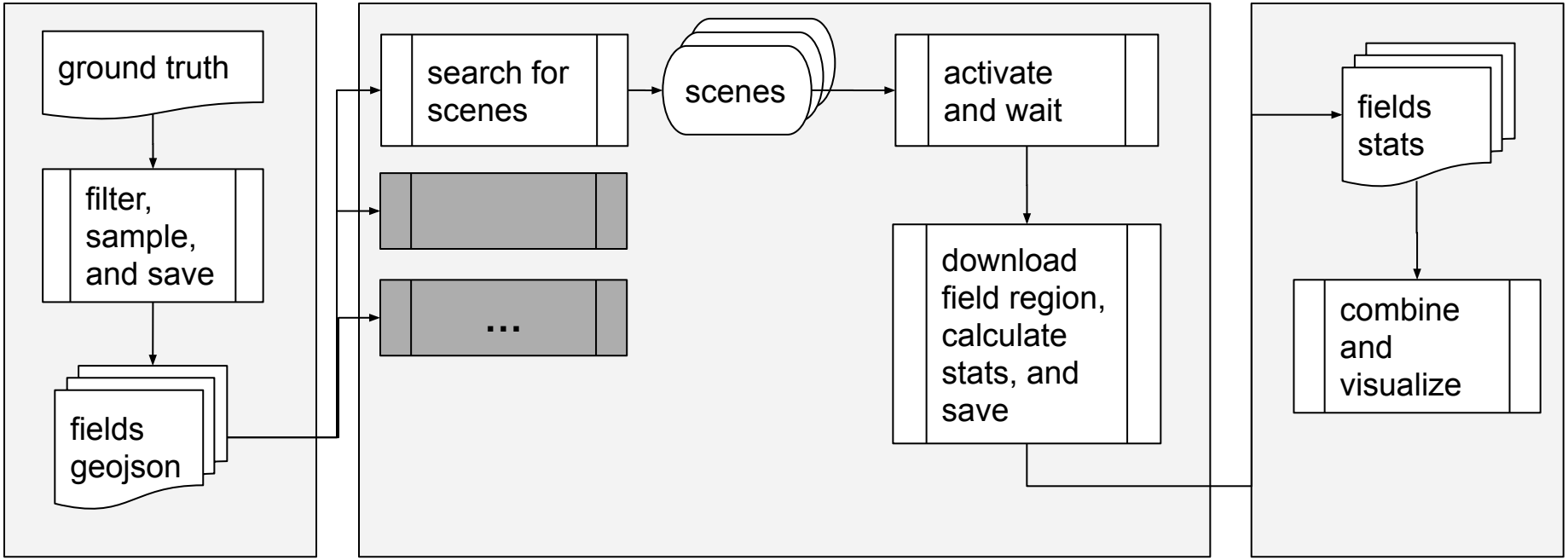
Image (RGB)



Overlap

Note: This is from DoveClassic, an older sensor. But, it's all we had in 2017

Data Flow

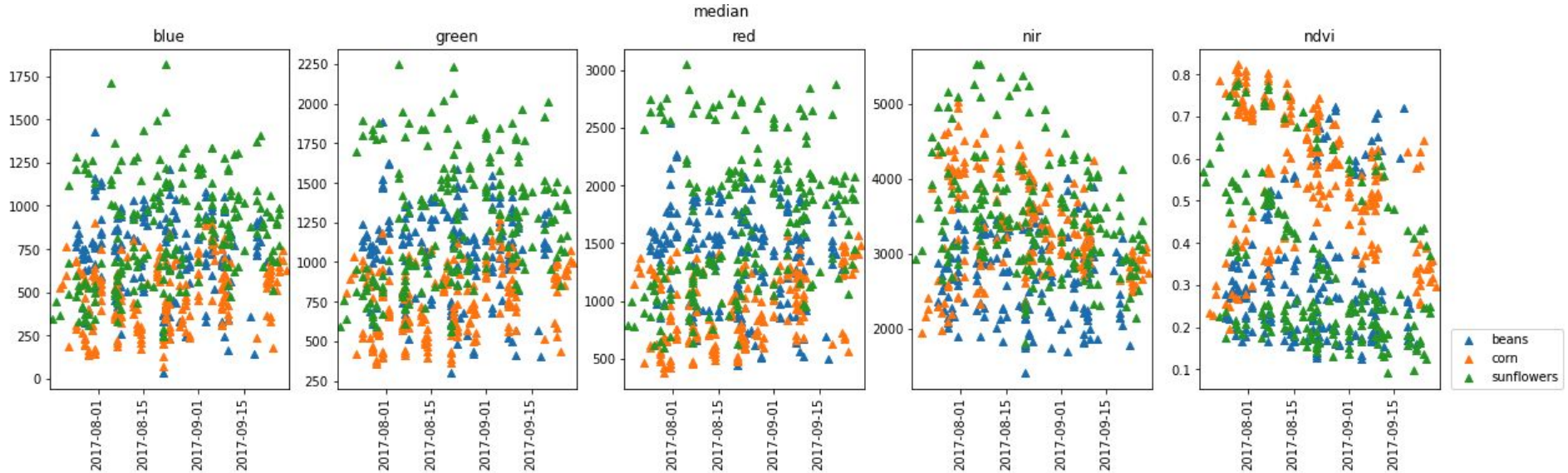


prepare
Jupyter notebook

process (async)
planet sdk for python
rio-tiler

visualize
Jupyter notebook

Results


median
blue
green
red
nir
ndvi
beans
corn
sunflowers
2017-08-01
2017-08-15
2017-09-01
2017-09-15

Outcomes

- some trends possible
  - need to process more fields
  - need concurrent ground truth / imagery
- async improves speed
  - 2.5 hours to <1 hour to process ~750 scenes
- async adds complication
  - rio-tiler and planet sdk async may conflict

Next steps

- parallel processing in the cloud
  - use lambda, google cloud functions, etc.
  - analyze more fields / more images per field
- more recent ground truth
  - ground truth and imagery coincide
  - make use of better sensors
- continue work on planet sdk for python

notebooks

https://github.com/planetlabs/notebooks/

planet sdk for python

https://github.com/planetlabs/planet-client-python/tree/v2

planet developer center

https://developers.planet.com/

contact

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