

Objective 1 Land Use Modeling Updates



October 7, 2020: LUWG

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Latest Land Use Tasks

- Refining pre-processing workflows
 - UVM-CIC segment workflow
 - Ancillary data:
 - CDL, NLCD, Local Data, HERE, OSM, etc.
 - Producing Parcels + Segments + tables
- Refining rules
 - Low Vegetation, Barren, Scrub/Shrub
 - Resolving conflicts
 - Low vegetation slivers
- Manual testing rules on subsets of counties
- Developing “production” workflow
 - Python
 - Structure PostgreSQL and PySpark

Upcoming Land Use Tasks

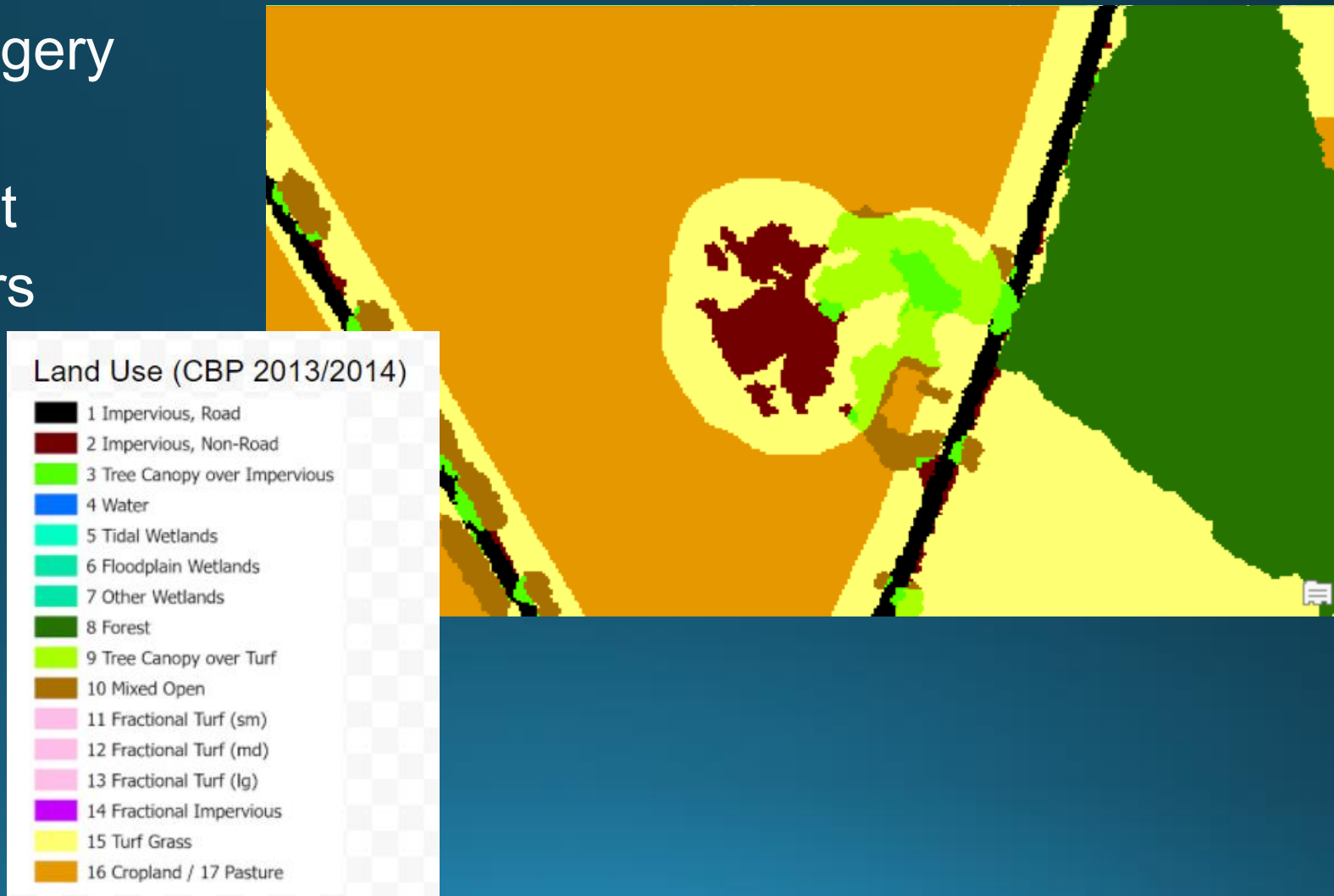
- Continue to refine logic
- Test latest logic at on full counties
 - Compare outputs to other data
 - Ag census
 - 2013/14 1m land use
 - CDL
- Ag WG next week
- Joint WG December
 - Forests
 - Timber harvest
 - Natural Succession

Local Data Pre-Processing

- Local data requiring processing
 - parcels
 - zoning or land use
- Pre-processing
 - Land cover segments
 - “Tabulation Area” (counting unique pixel values in each polygon)
 - Cropland Data Layer
 - 2017/2018 Land cover
 - Local data

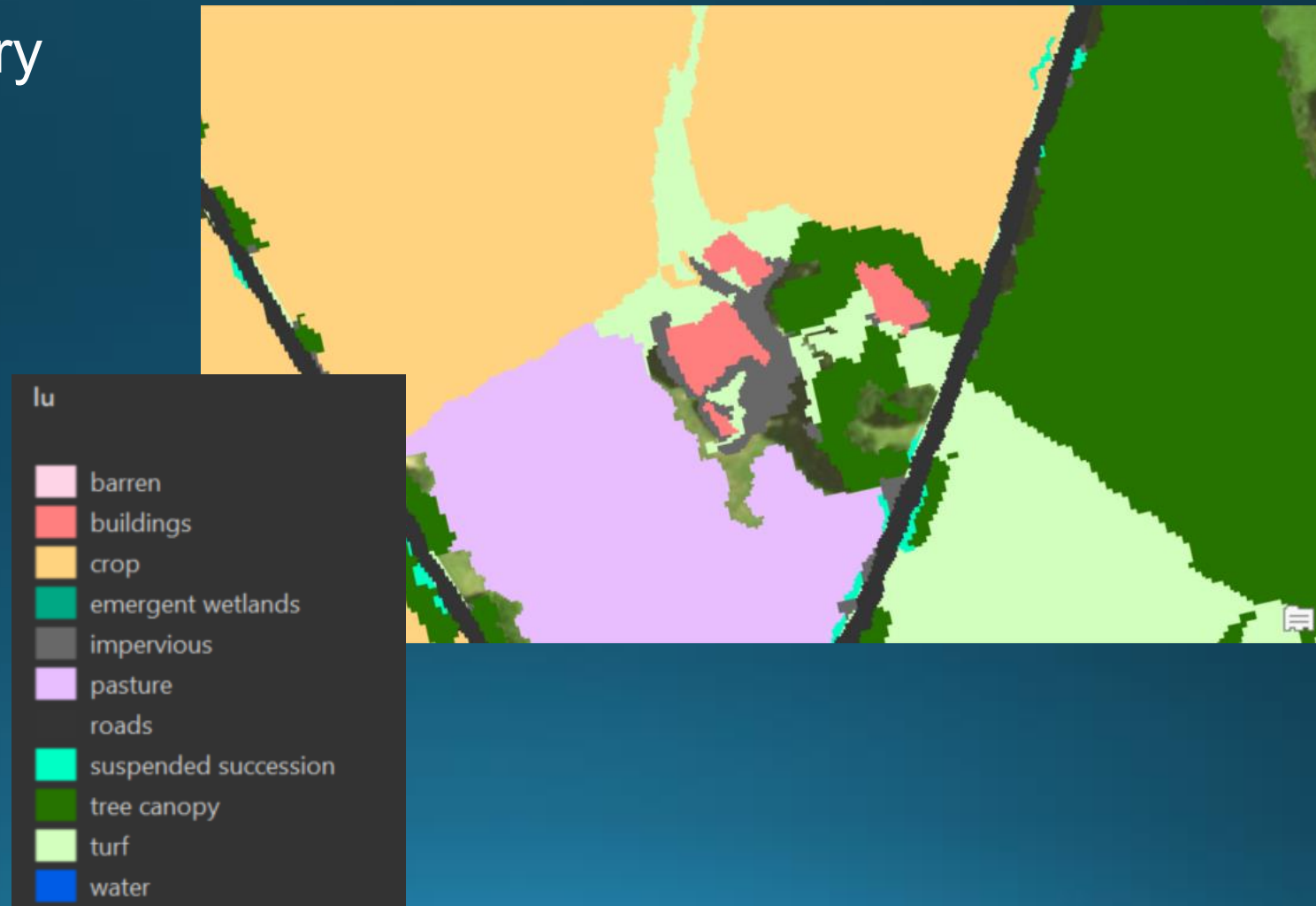
Review: what are “segments”?

- Shapes derived from imagery
- Group of similar pixels
- Intermediate data product
- To avoid “artificial” borders
- Help identify land uses



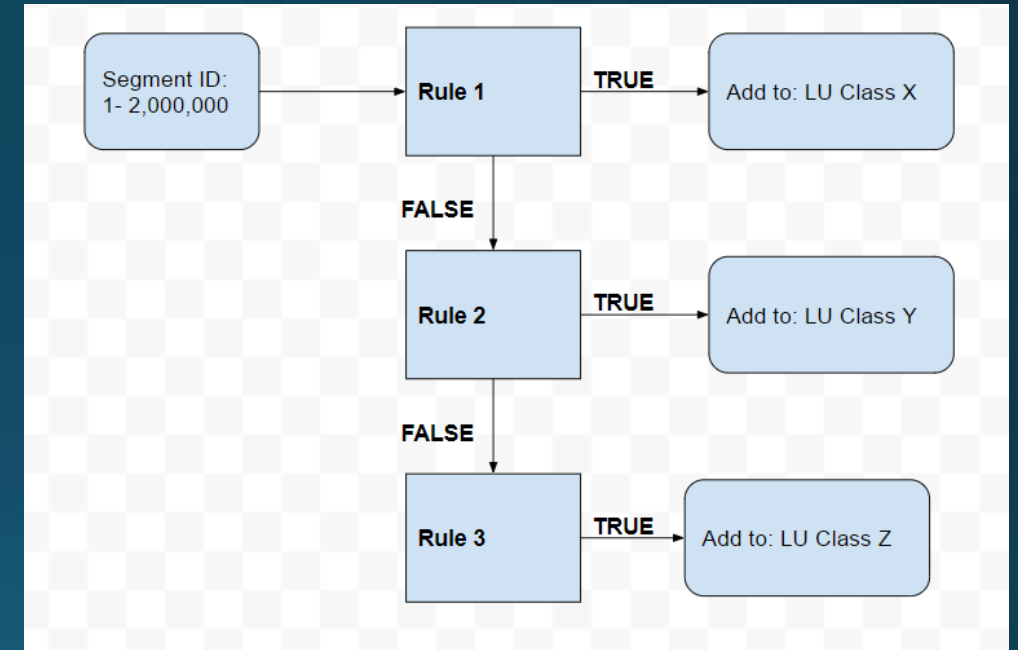
Review: what are “segments”?

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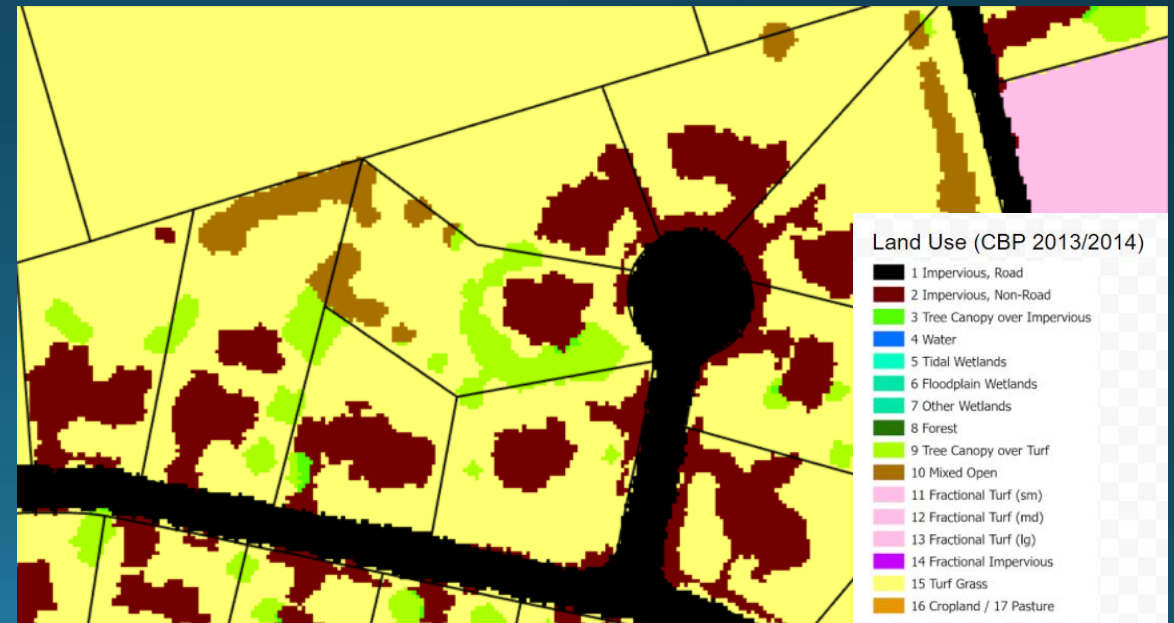
Refining Rules

- Leaning towards high confidence and omission
- Tracking every step
- Rulesets like a dichotomous key
 - Refine order of rules
- Reliance on local and ancillary data
- General logic is set
- Thresholds/limits may change



Turf, small parcel: Logic

- Seg LC = 'Low Vegetation'
- Parcel area ≤ 1 acre
- Parcel contains ≥ 93 m² impervious classes



Suspended Succession, Roadside: Logic

STEP 1

- Small parcel Logic

STEP 2 (check small segs)

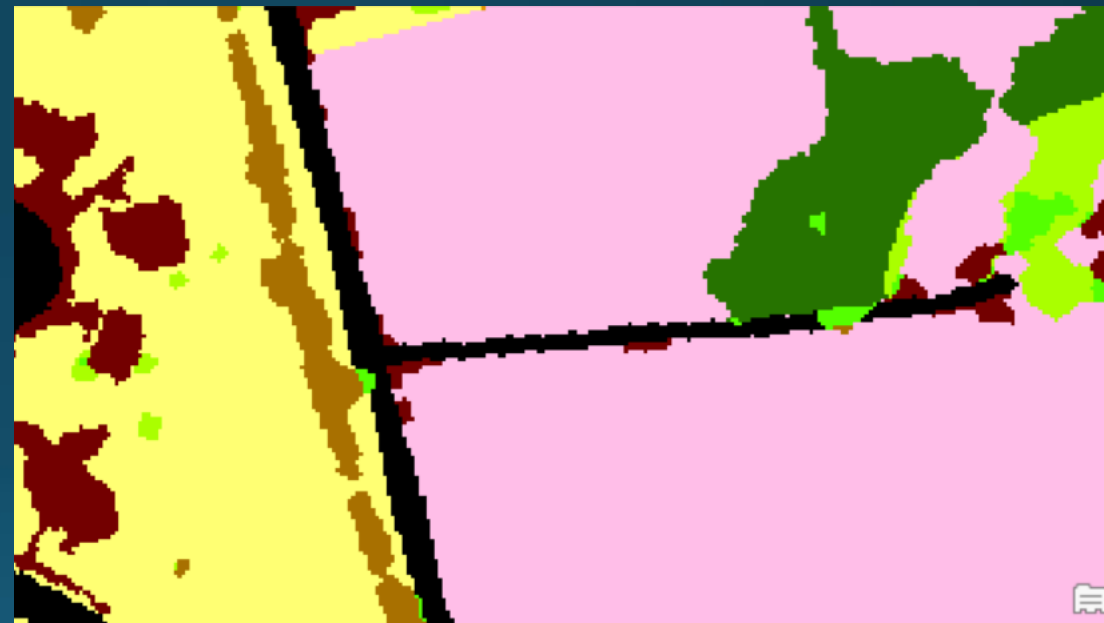
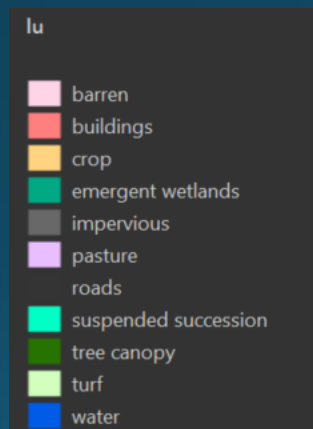
- No existing LU
- LC = 'Low Vegetation'
- Seg area $\leq 50 \text{ m}^2$
- LV Seg touches Road Seg

STEP 3

- Large seg Ag Logic

STEP 4 (revisit larger segs)

- No existing LU
- LC = 'Low Vegetation'
- Seg area $\leq 1,000 \text{ m}^2$
- LV Seg touches Road Seg



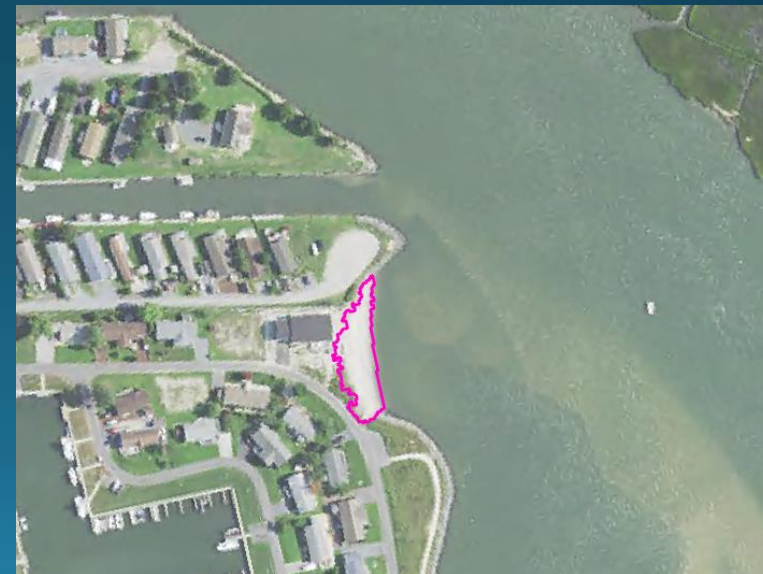
Crop, Small Parcel: Logic

- LC = 'Low Vegetation'
- Local data (reclassified) = 'turf'
- Seg area $\geq 10,000 \text{ m}^2$
- Seg $\geq 20\%$ CDL1
 - (crop, simplified CDL)



Bare Shore: Logic

- Barren within 3 meters water $>15 \text{ m}^2$
AND Perimeter to Area Ratio $\leq .67$
- Exclude barren $\leq 100,000 \text{ m}^2$ that overlaps with wetland segments $> 15 \text{ m}^2$
- Exclude barren that intersects with
 - Mines
 - Landfills
 - Specific local data classes: suspended succession, extractive, agriculture, wetlands



Bare Shore: example



Solar Field Logic

- Seg LC = 'Low Vegetation', 'Scrub/Shrub', or 'Impervious'
- Segments intersect with Solar field polygons

NOTE: Testing with manually digitized solar field data. Final production will use AI produced polygons.



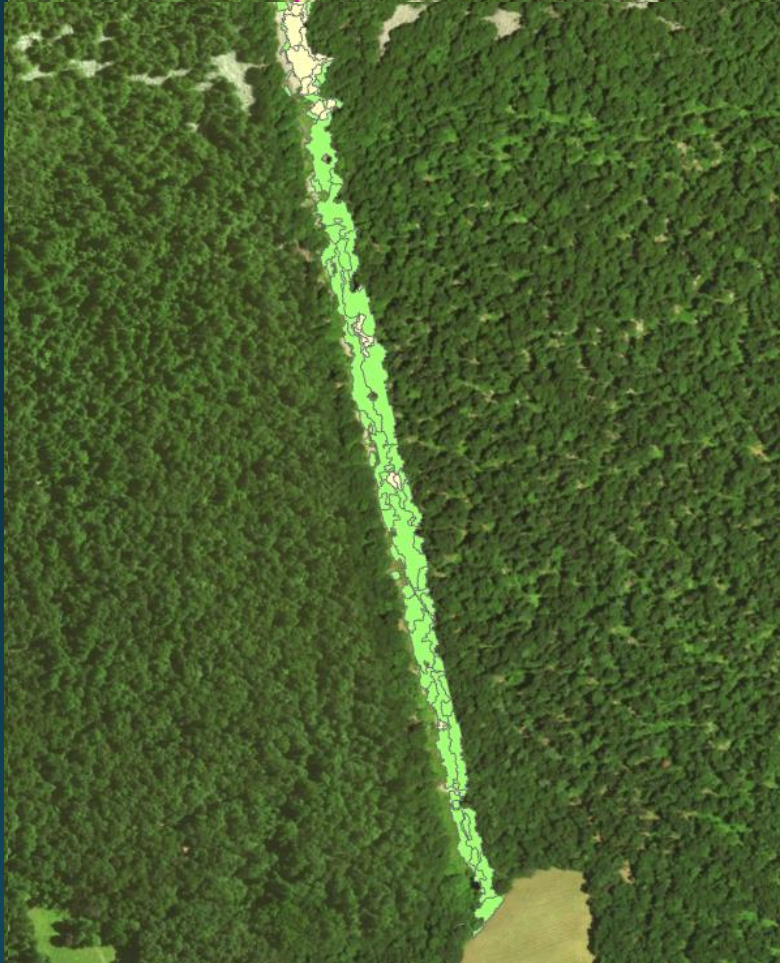
Solar Field Decision

- What is the low vegetation between and surrounding solar panels?
 - Suspended succession or Turf grass

Suspended Succession: Transmission Rules

- Buffer transmission lines by 25 meters
- Intersect low vegetation, scrub/shrub, and barren with buffered transmission lines
- Remove from selection if $\geq 35,000 \text{ m}^2$

Suspended Succession: Transmission



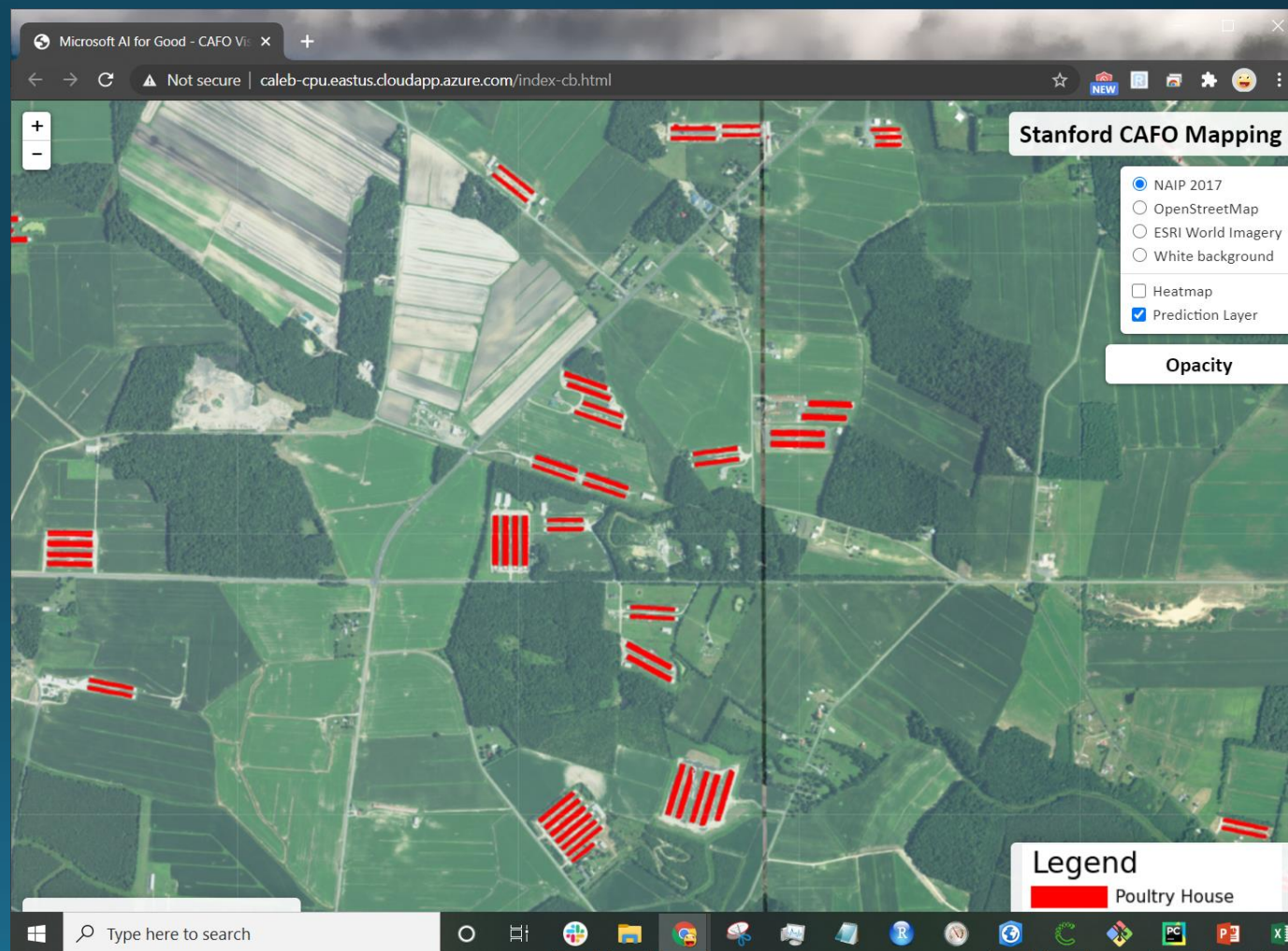
Omission Issues



Bonus!

Automated Chicken House Detection

- Caleb Robinson - Microsoft AI for Good
- [Link to Web App](#)
- Current status
 - Identifies chicken houses in MD, DE and PA
 - Few results in NJ and NY
 - Commission errors on roads and urban areas



Questions?

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