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NLCD: Balancing accuracy and methodology innovation with increasing production Frequency

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Overview

- More Maps, mo problems
- How to incorporate partner data
- Is accuracy assessment still a thing?

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Conterminous United States overall accuracies (OA; %) and (standard errors) by NLCD product year. Agreement is based on a match between the map and primary or alternate reference labels. Accuracy trends for land cover components (Year of Land Cover) are reported column-wise.

NLCD Product	Year of Land Cover			
Year	2001	2006	2011	2016
	Level II			
2001*	78.8 (2.1)			
2006	79.0 (0.8)	78.0 (0.8)		
2011	83.2 (0.5)	82.8 (0.5)	82.0 (0.5)	
2016	83.7 (0.5)	83.6 (0.5)	86.8 (0.7)	86.4 (0.6)
	Level I			
2001*	80.4 (1.9)			
2006	85.0 (0.4)	84.0 (0.7)		
2011	89.3 (0.4)	89.0 (0.4)	88.0 (0.4)	
2016	89.2 (0.5)	89.2 (0.5)	90.5 (0.6)	90.6 (0.6)

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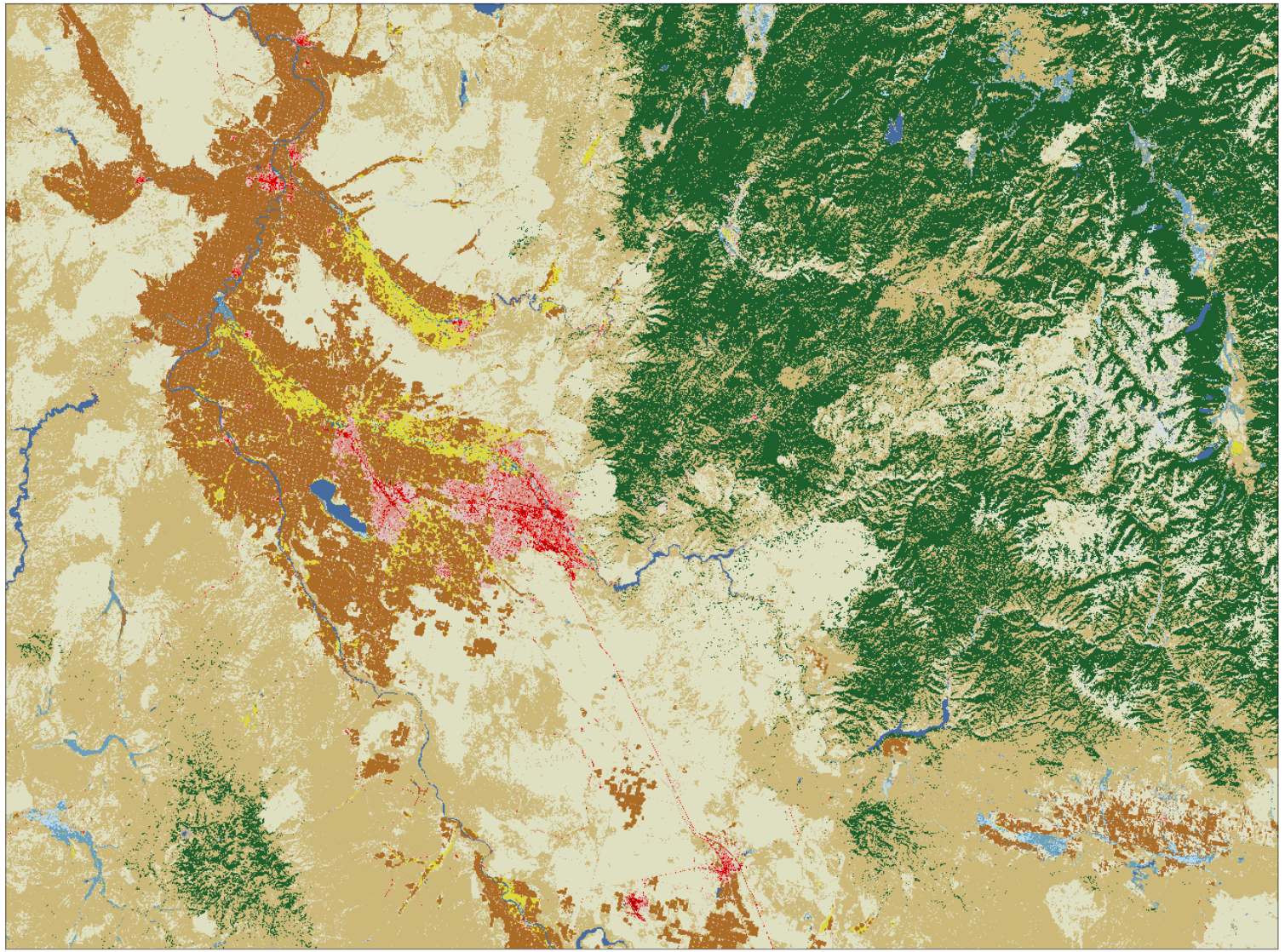
NLCD Land Cover 2001



- Open Water (11)
- Perennial Ice/Snow/ (12)
- Developed, Open Space (21)
- Developed, Low Intensity (22)
- Developed, Medium Intensity (23)
- Developed, High Intensity (24)
- Barren Land (Rock/Sand/Clay) (31)
- Unconsolidated Shore (32)
- Deciduous Forest (41)
- Evergreen Forest (42)
- Mixed Forest (43)
- Dwarf Scrub(AK only) (51)
- Shrub/Scrub (52)
- Grasslands/Herbaceous (71)
- Sedge/Herbaceous(AK only) (72)
- Lichens (Ak only) (73)
- Moss (AK only) (74)
- Pasture/Hay (81)
- Cultivated Crops (82)
- Woody Wetlands (90)
- Emergent Herbaceous Wetlands (95)

Change is rare

- Landcover change is less than half a percent per year
- Each land cover map, for a good Landcover map, has an accuracy between 80 and 90%
- with increasing frequency of each map, change accuracy has the potential to decrease as frequency increases

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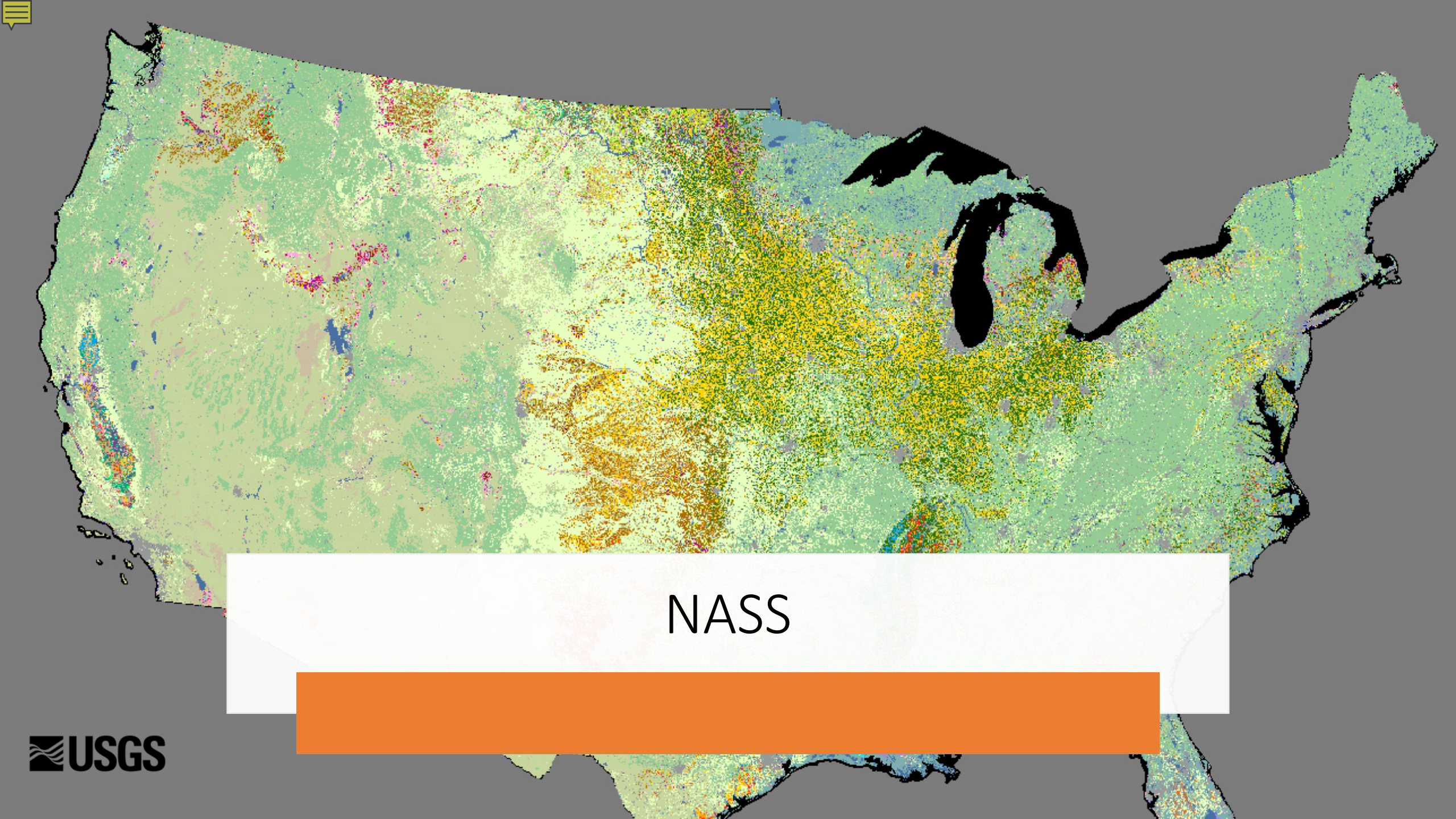

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Interpretation accuracy

- Anderson level II classes require high-res imagery at a minimum to discern classes
- Change can be incomplete across a single year
- High-res imagery tends to be available every five years or so, leaving guesswork for accuracy interpretation

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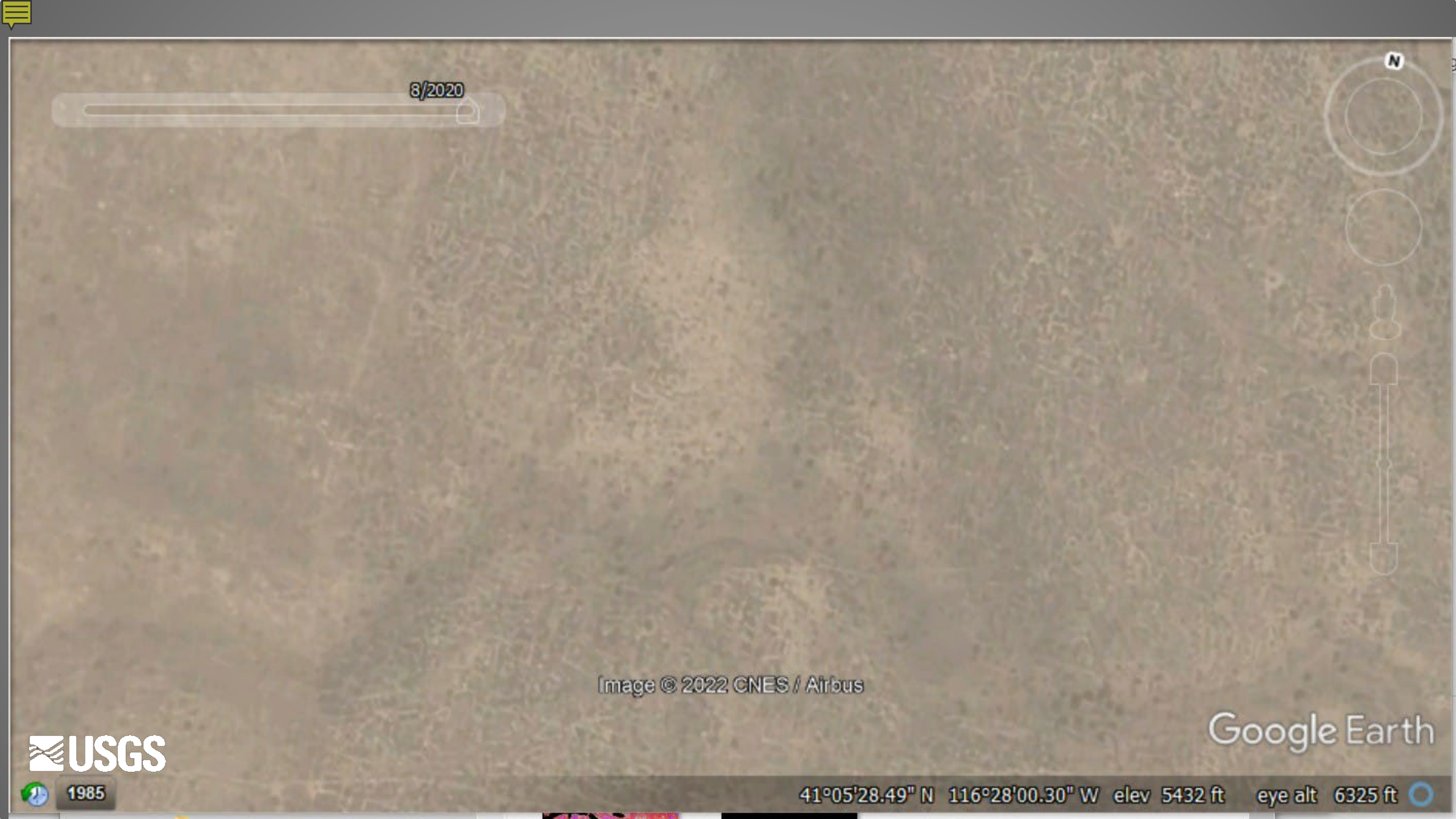
7/2014
N
USGS
Google Earth
1985
Imagery Date: 7/4/2014 41°05'28.49" N 116°28'00.30" W elev 5432 ft eye alt 6325 ft


8/2020
N
Image © 2022 CNES / Airbus
Google Earth
USGS
1985
41°05'28.49" N 116°28'00.30" W elev 5432 ft eye alt 6325 ft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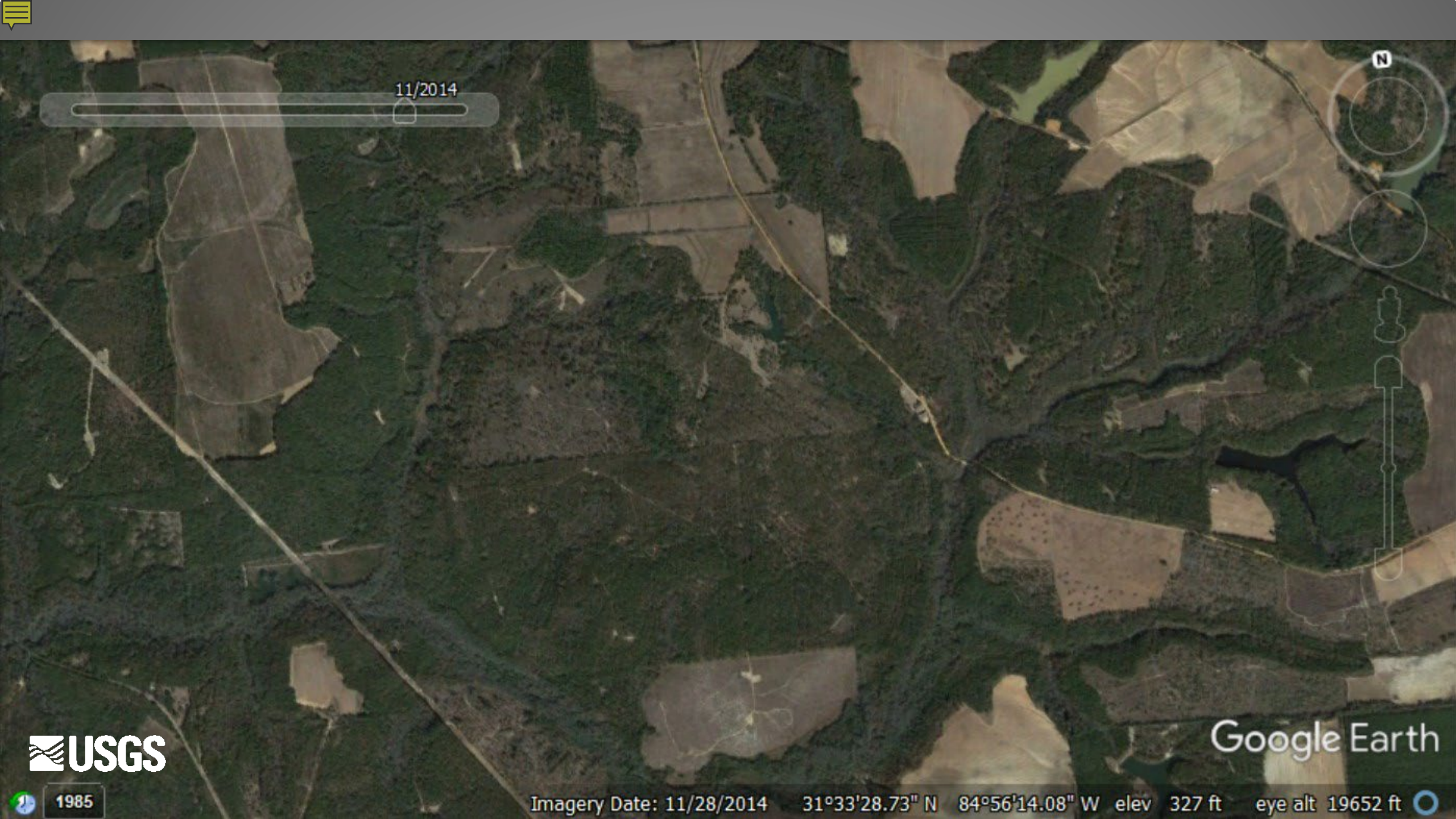
11/2014
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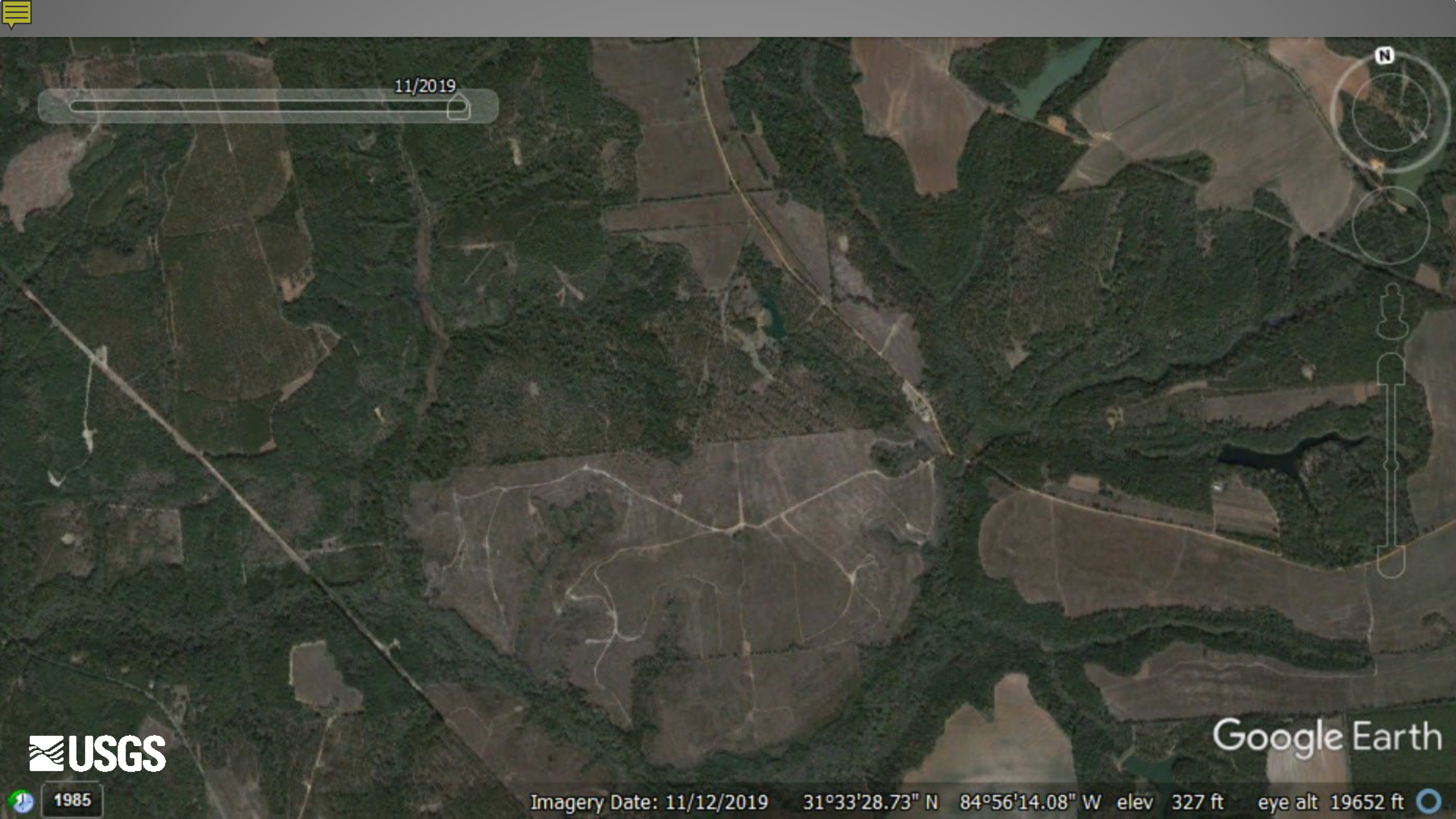
1985
Imagery Date: 11/28/2014 31°33'28.73" N 84°56'14.08" W elev 327 ft eye alt 19652 ft


11/2019
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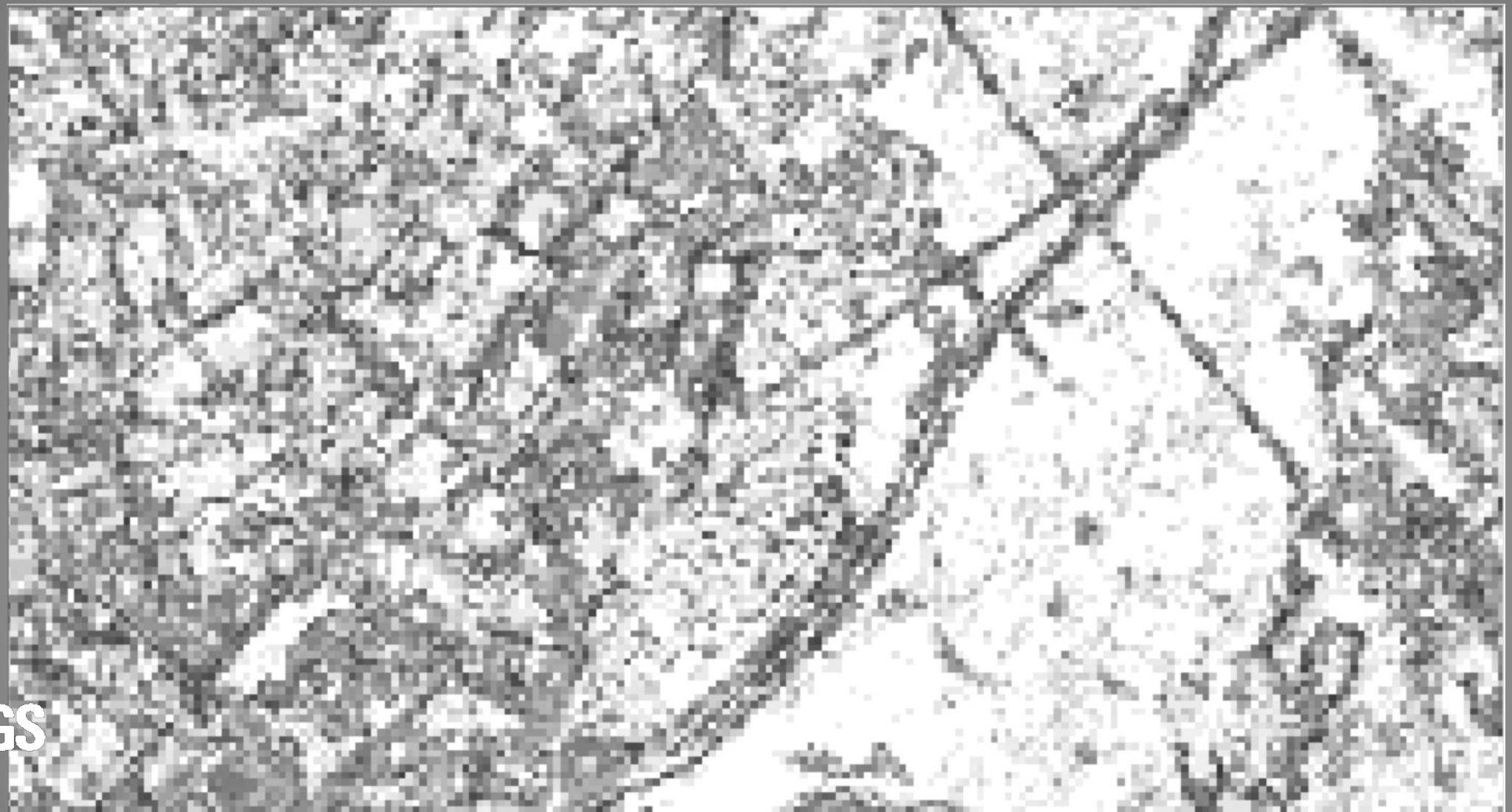
USGS
Google Earth
1985
Imagery Date: 11/12/2019 31°33'28.73" N 84°56'14.08" W elev 327 ft eye alt 19652 ft

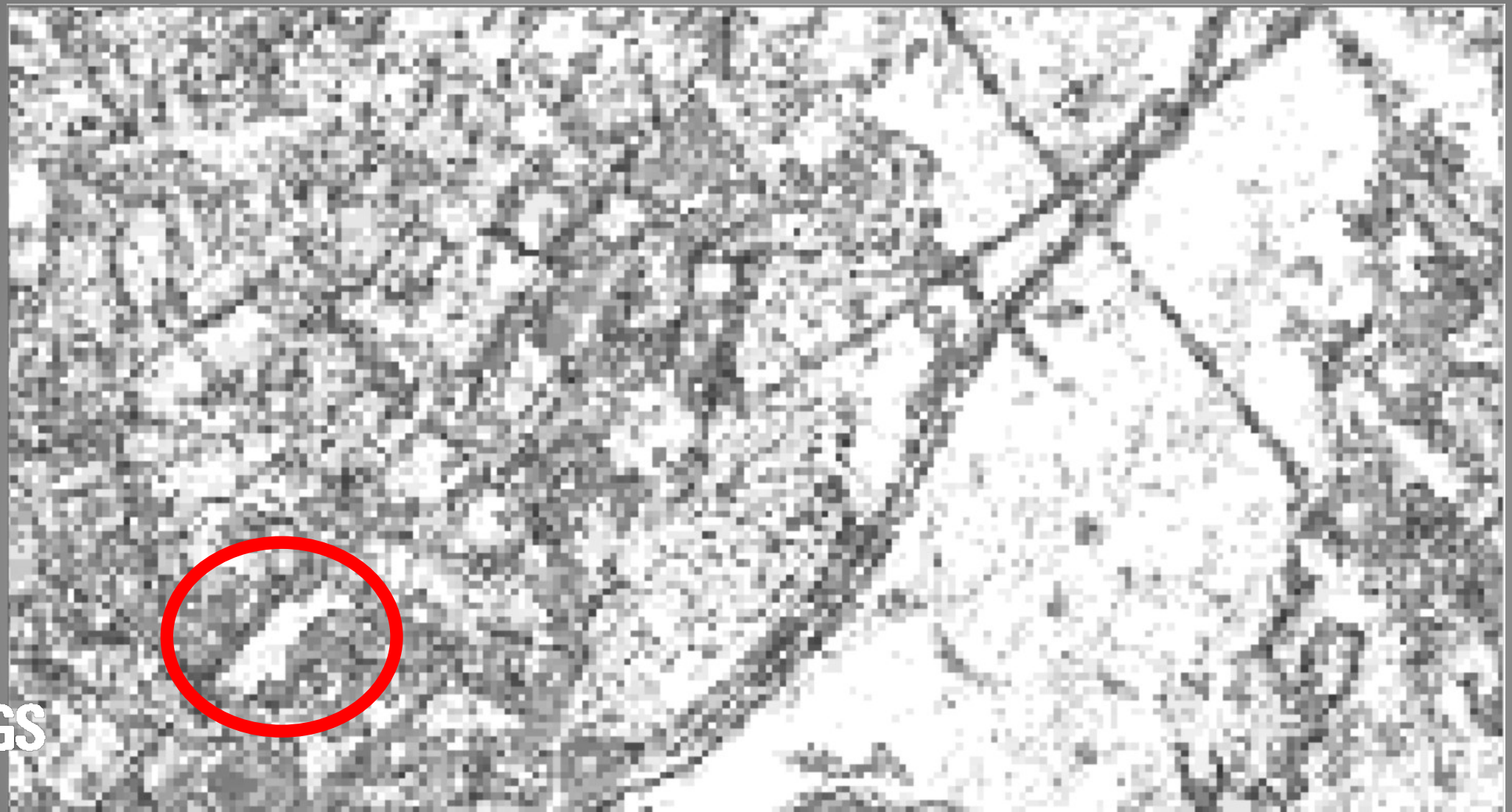

4/2002
Carr Branch
Image U.S. Geological Survey
Google Earth
1985
Imagery Date: 3/31/2002 33°41'45.00" N 83°58'08.83" W elev 770 ft eye alt 5457 ft


10/2015
N
USGS
Google Earth

Model accuracy



Model accuracy



Conclusions

- Map accuracy will likely decrease as map frequency is increased
- Change is relatively rare at less than half a percent a year, and map error compounds without meticulous and stringent change methodology
- Interpretation accuracy decreases with increasing map frequency for Anderson level II classes
- Model accuracy is not directly related to true Landcover accuracy
- Accuracy assessment needs to be funded as vigorously as new maps are being funded

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