

# Reconciling Ag Census with Phase 6 Land Use

September 22, 2016

## Agricultural Workgroup Meeting

Peter Claggett<sup>1</sup>, Andy Fitch<sup>1</sup>, Lindsey Gordon<sup>2</sup>, Fred Irani<sup>1</sup>, Cassandra Ladino<sup>1</sup>,  
Quentin Stubbs<sup>1</sup>, Renee Thompson<sup>1</sup>, Jacob Czawlytko<sup>3</sup>, Labeeb Ahmed<sup>3</sup>, Jason  
Chang<sup>3</sup>, Zach Clifton<sup>3</sup>, Alex Rittle<sup>3</sup>

<sup>1</sup> US Geological Survey, Eastern Geographic Science Center

<sup>2</sup> Chesapeake Research Consortium

<sup>3</sup> USGS Student Contractors

# Local land use and parcel data

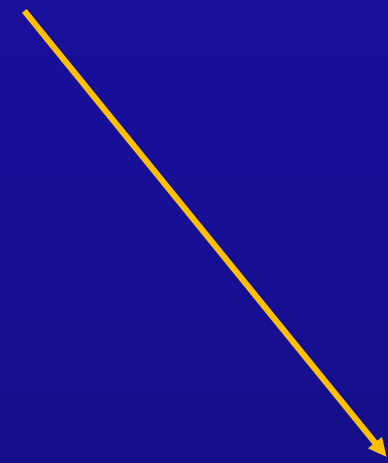


- Low-density Residential
- Recreation
- Agriculture
- Roads

# High-resolution land cover data



- Impervious surfaces
- Tree canopy
- Low vegetation
- Water



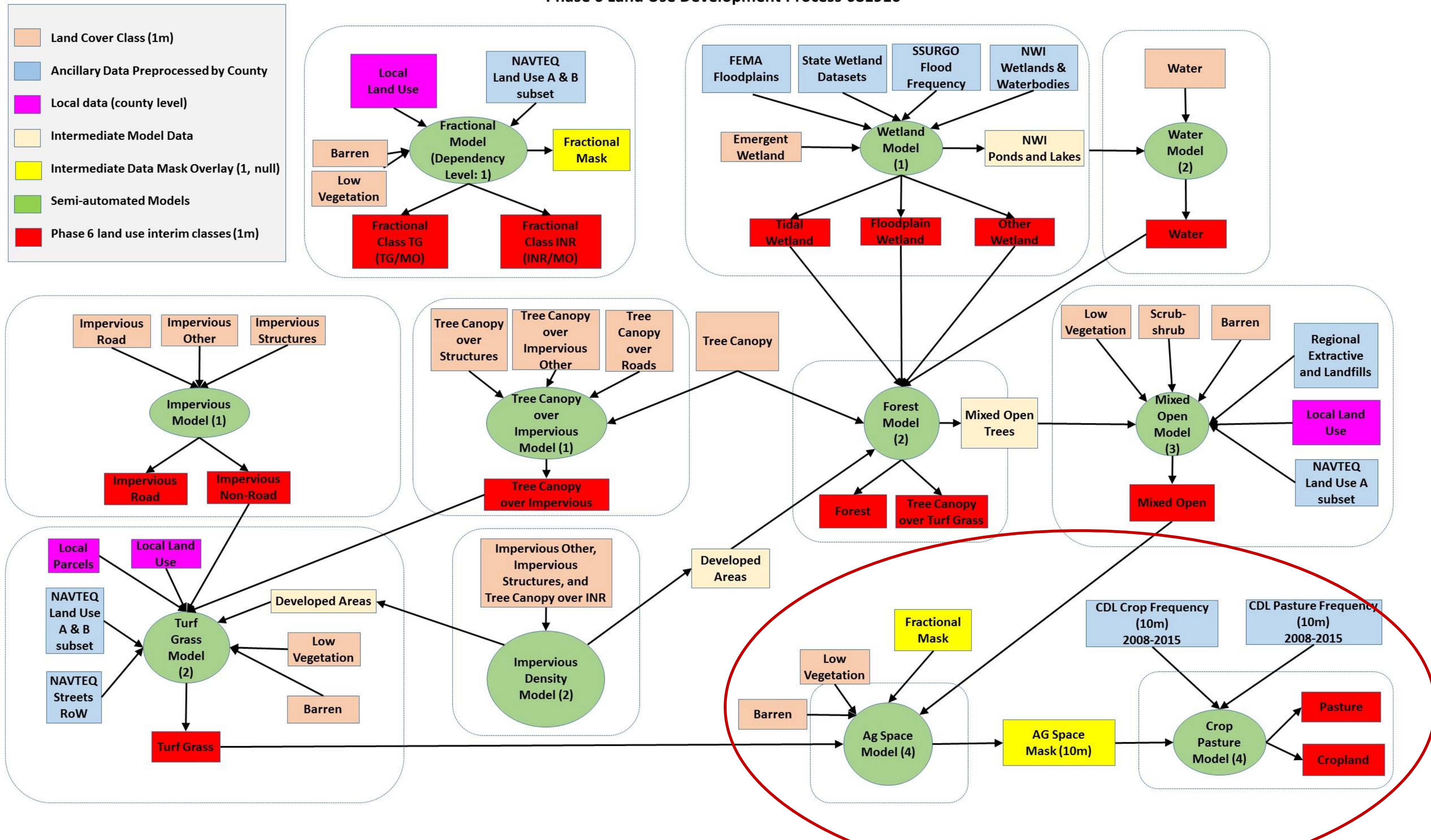
## Phase 6 Land Uses

- Impervious-Roads
- Forests
- Turf Grass
- Open Space



# Phase 6 Land Use Development Process (all but Virginia)

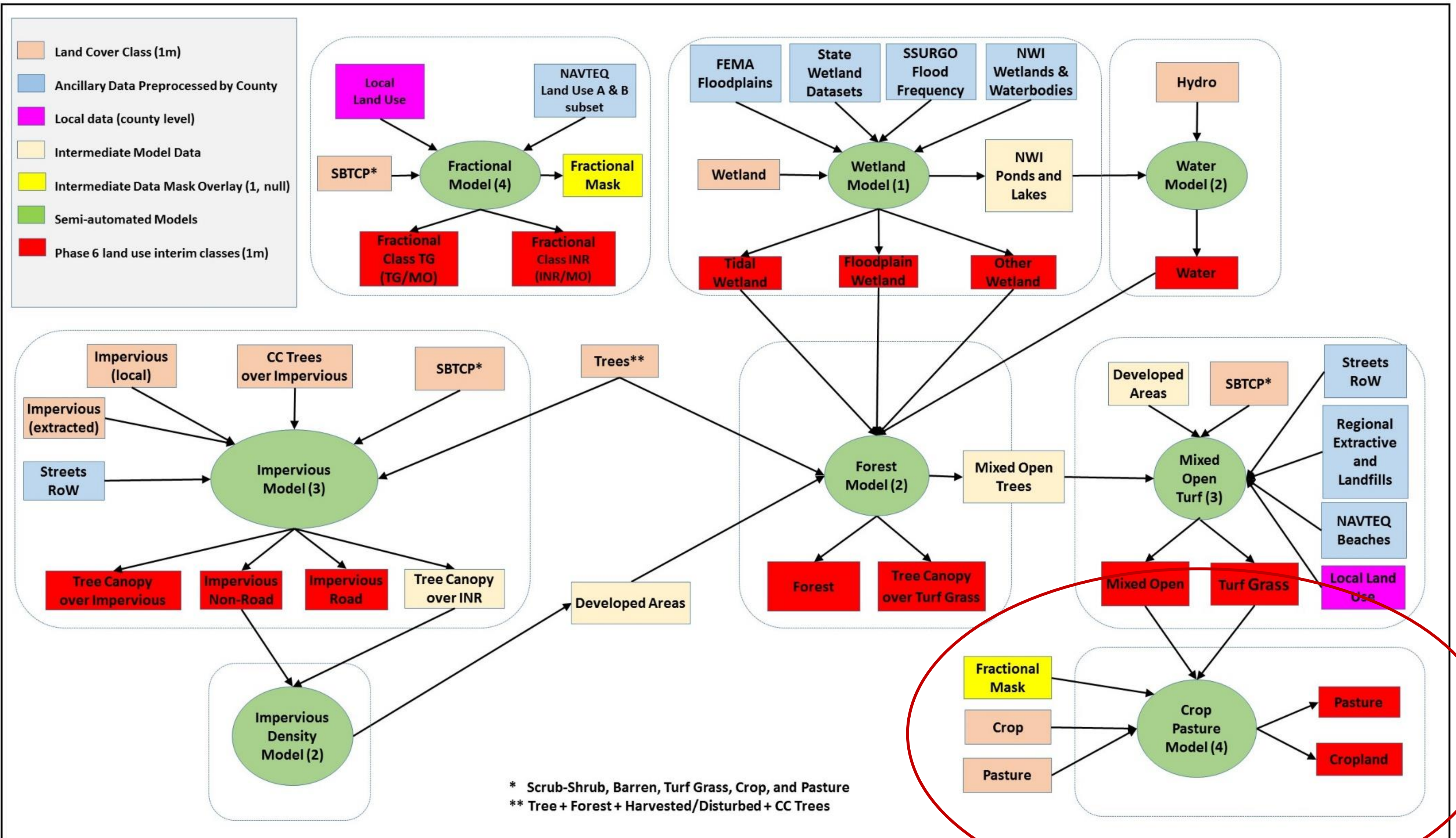
Phase 6 Land Use Development Process 081916





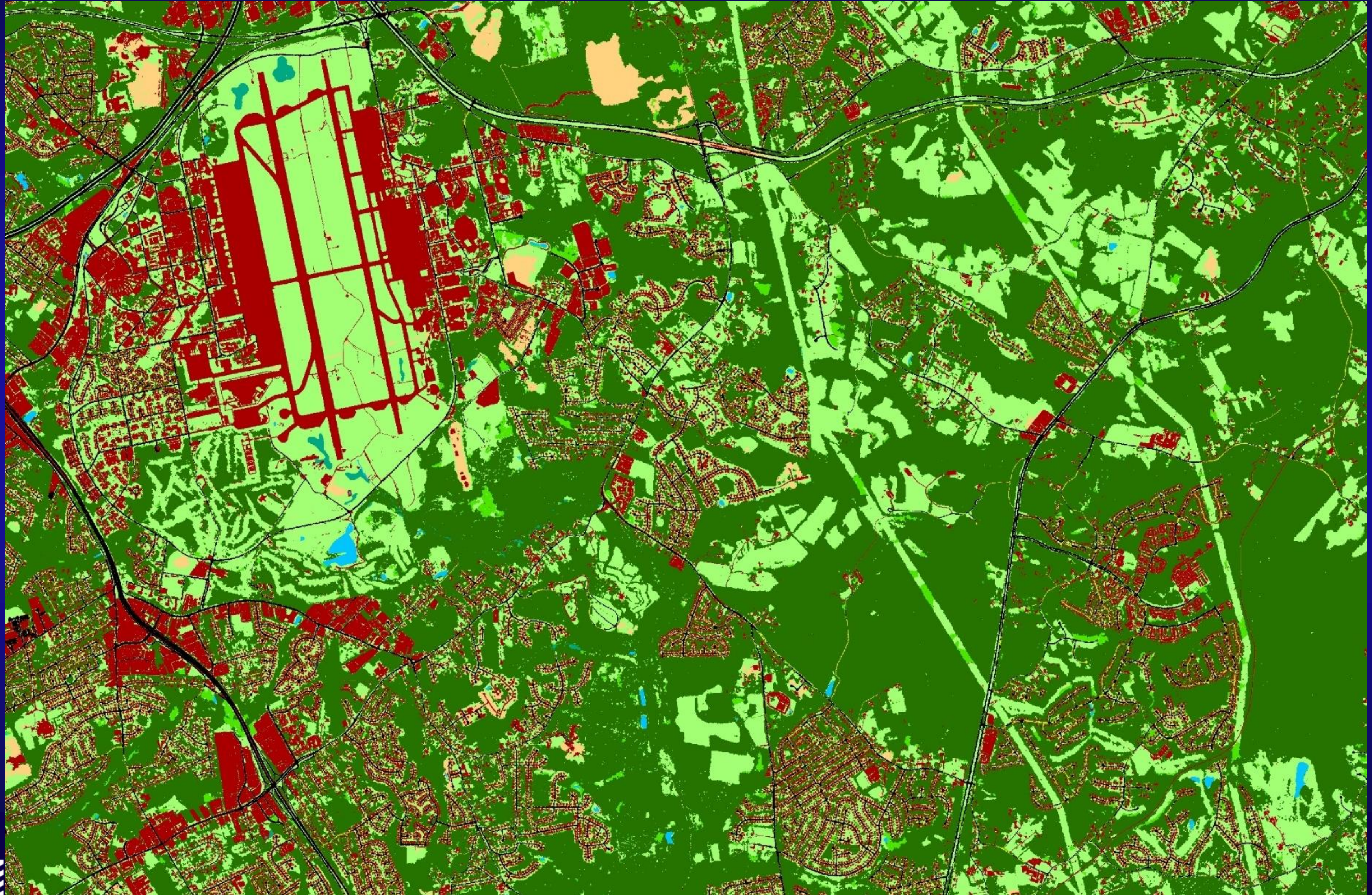
# Virginia Phase 6 Land Use Development Process

Phase 6 VA Land Use Development Process 072816



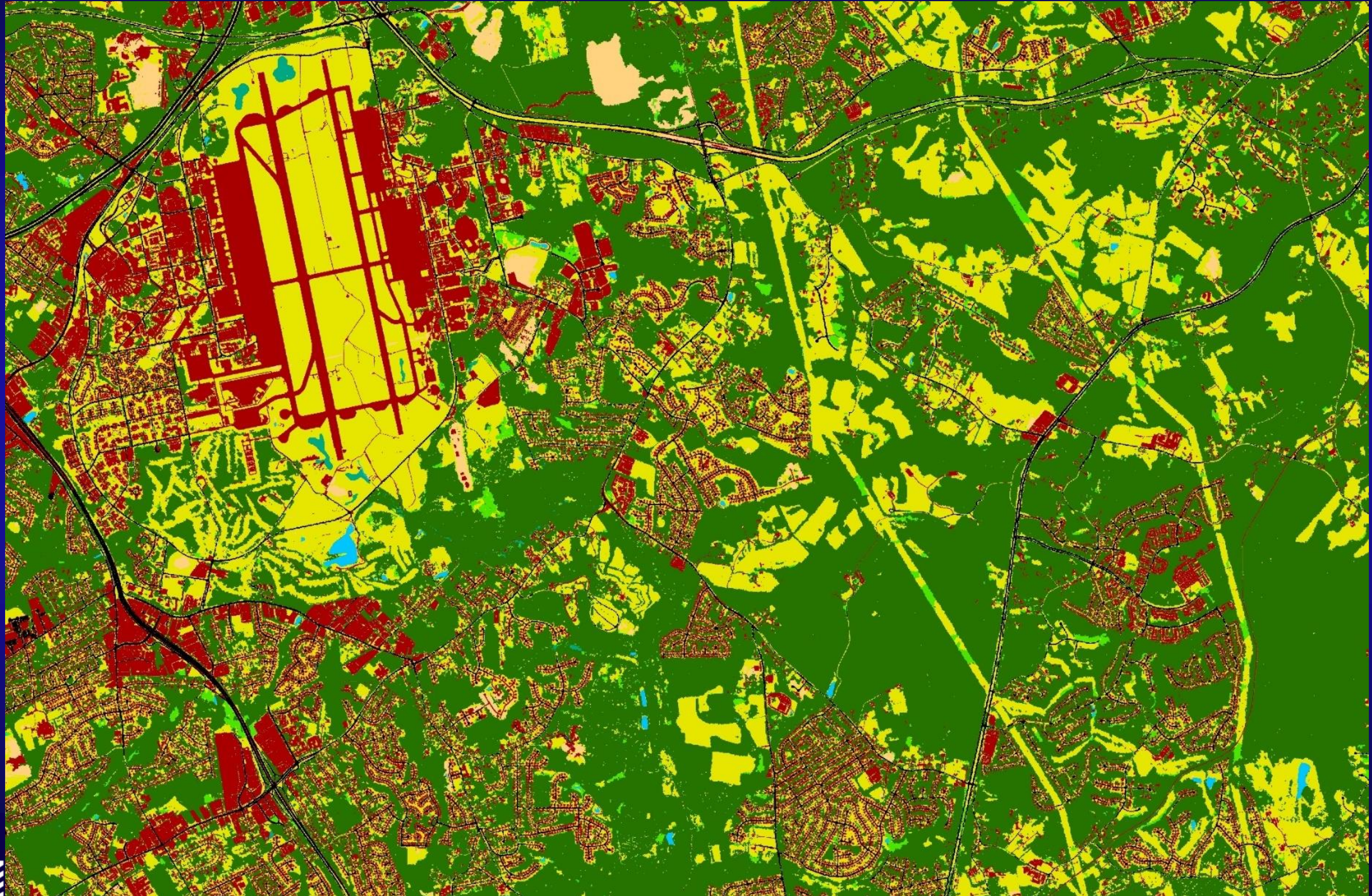


# Turf Grass vs Agriculture (land cover)



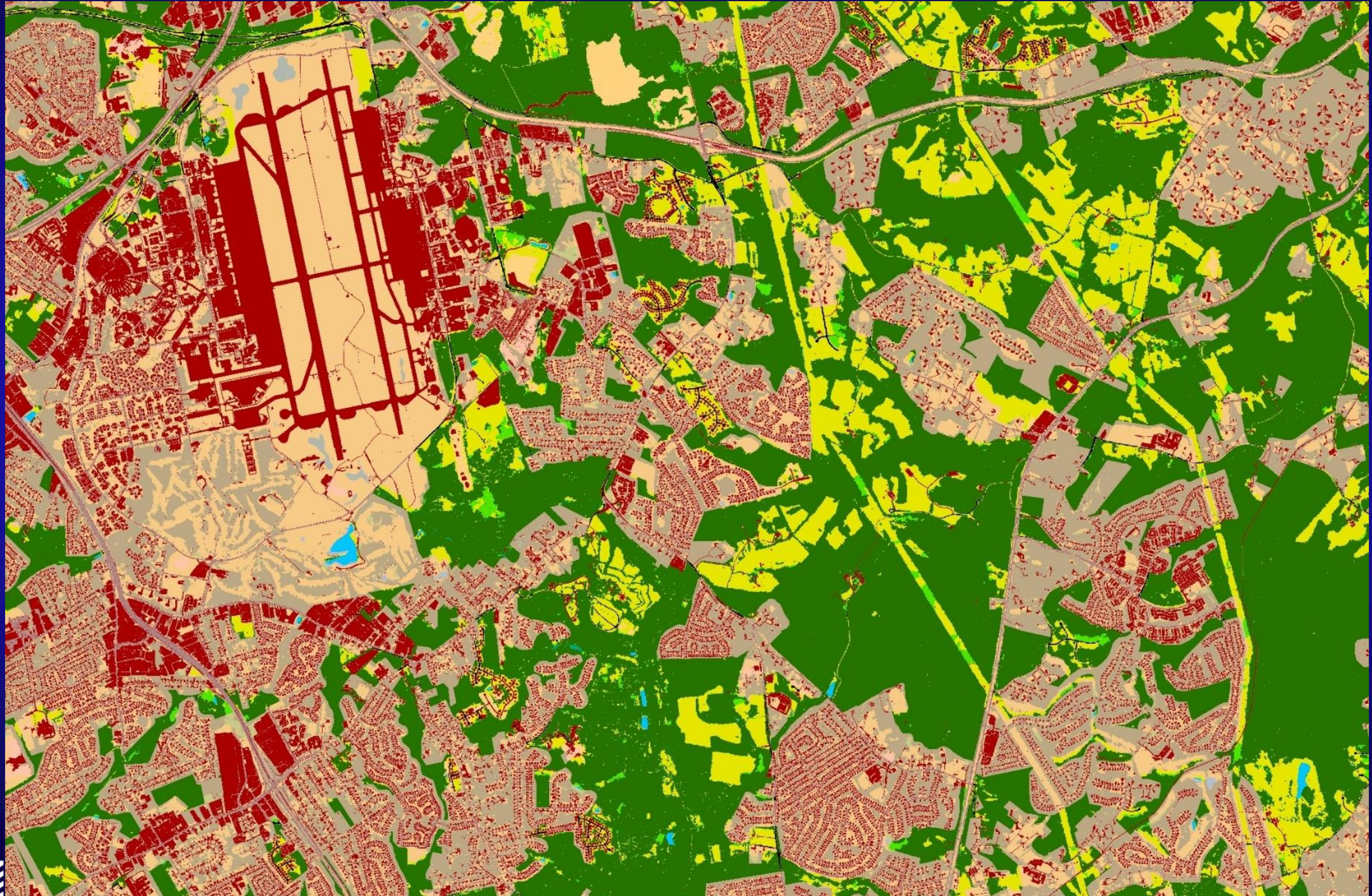


# Turf Grass vs Agriculture (low vegetation)



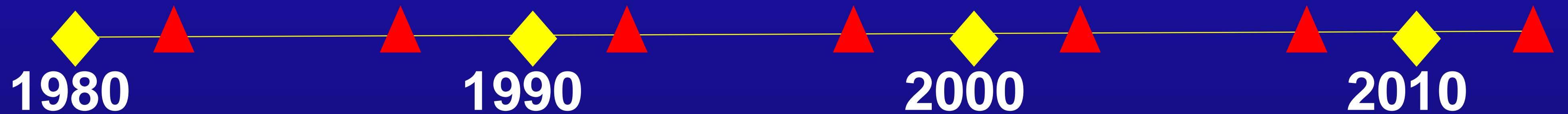


# Turf Grass vs Agriculture (developed land use overlay)





# Data used Previously to Backcast Land Use for Calibrating the Chesapeake Watershed Model



◆ Census of Population and Housing (block level)

▲ Census of Agriculture (county level)

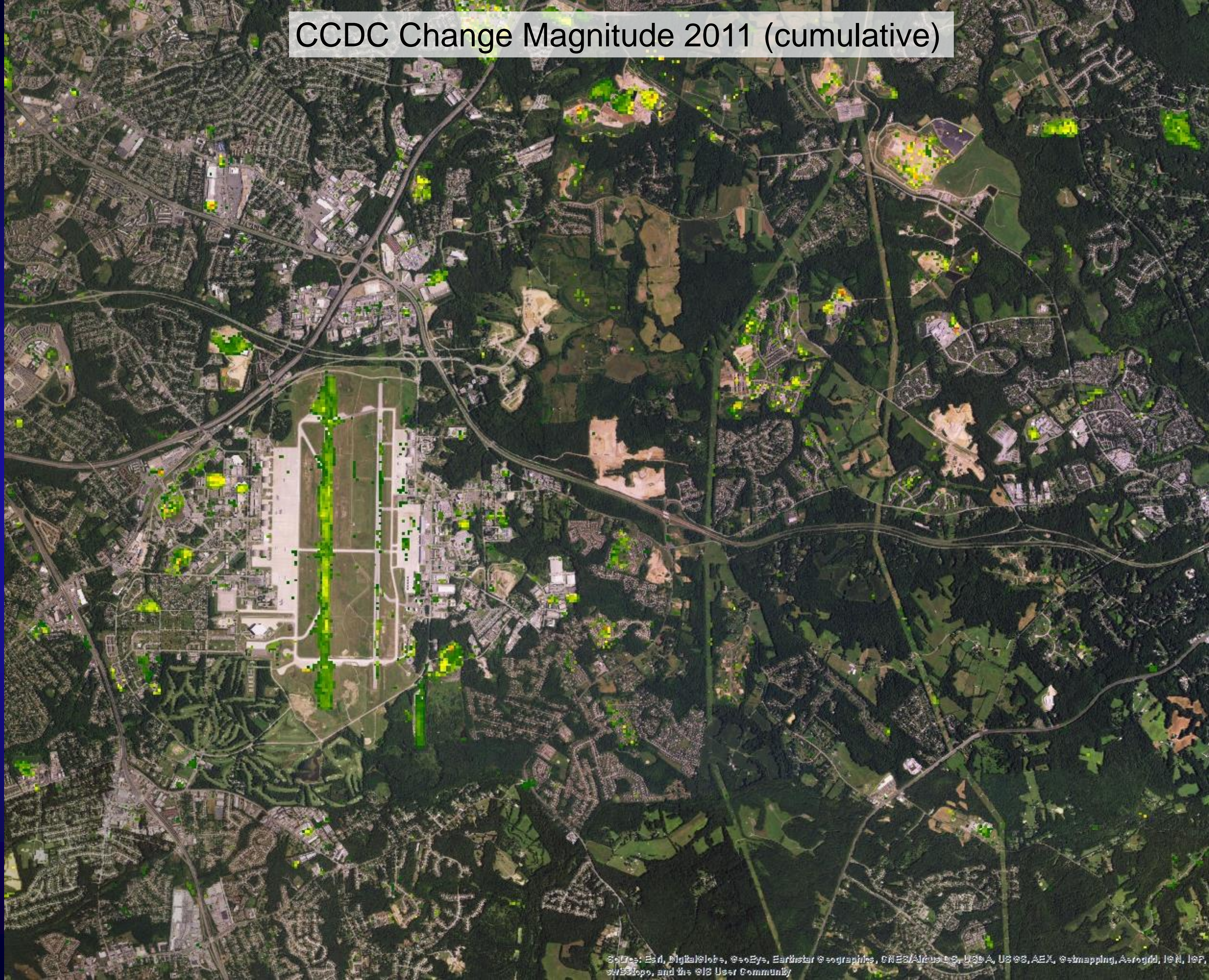


# CCDC Change Magnitude 2010



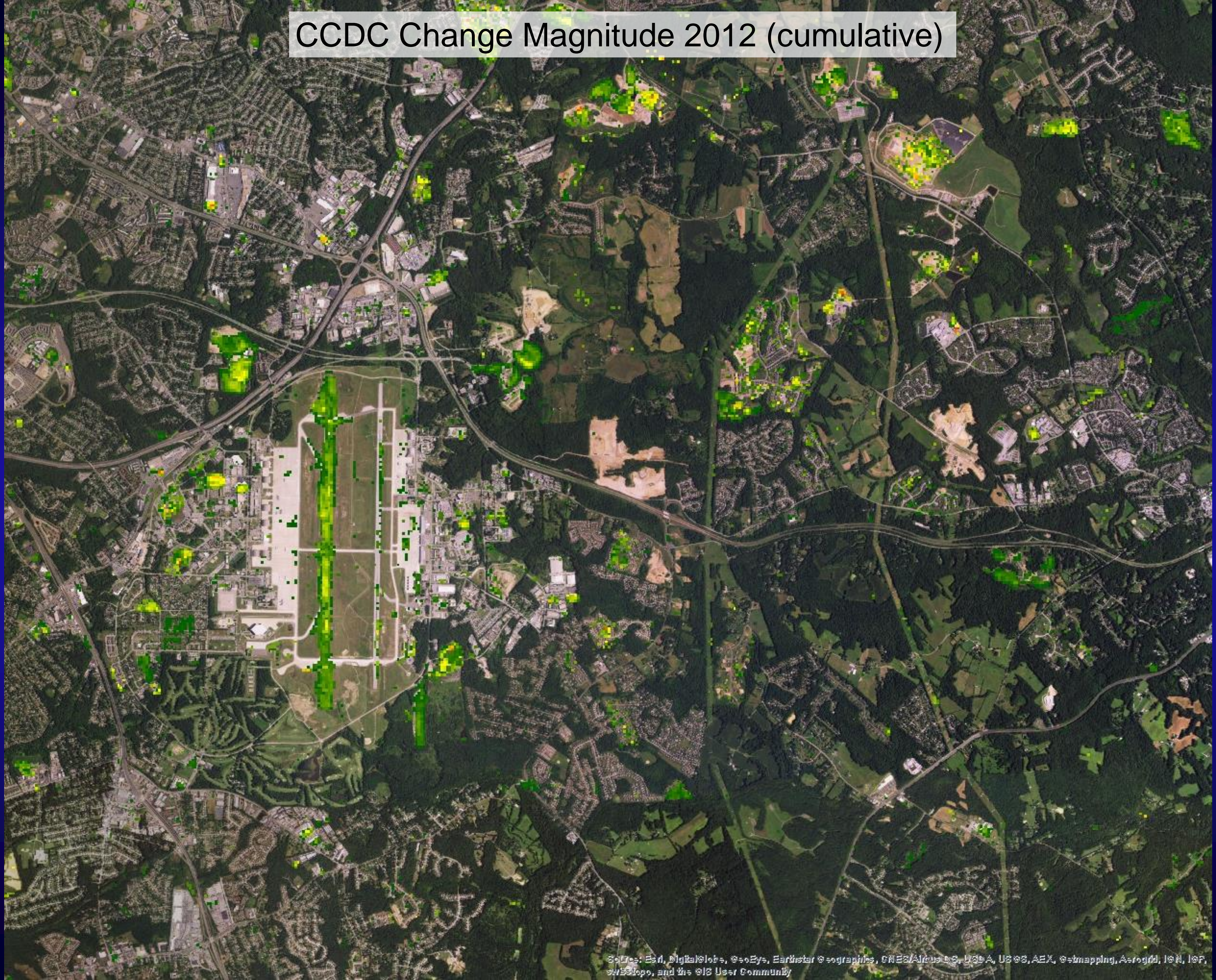


# CCDC Change Magnitude 2011 (cumulative)



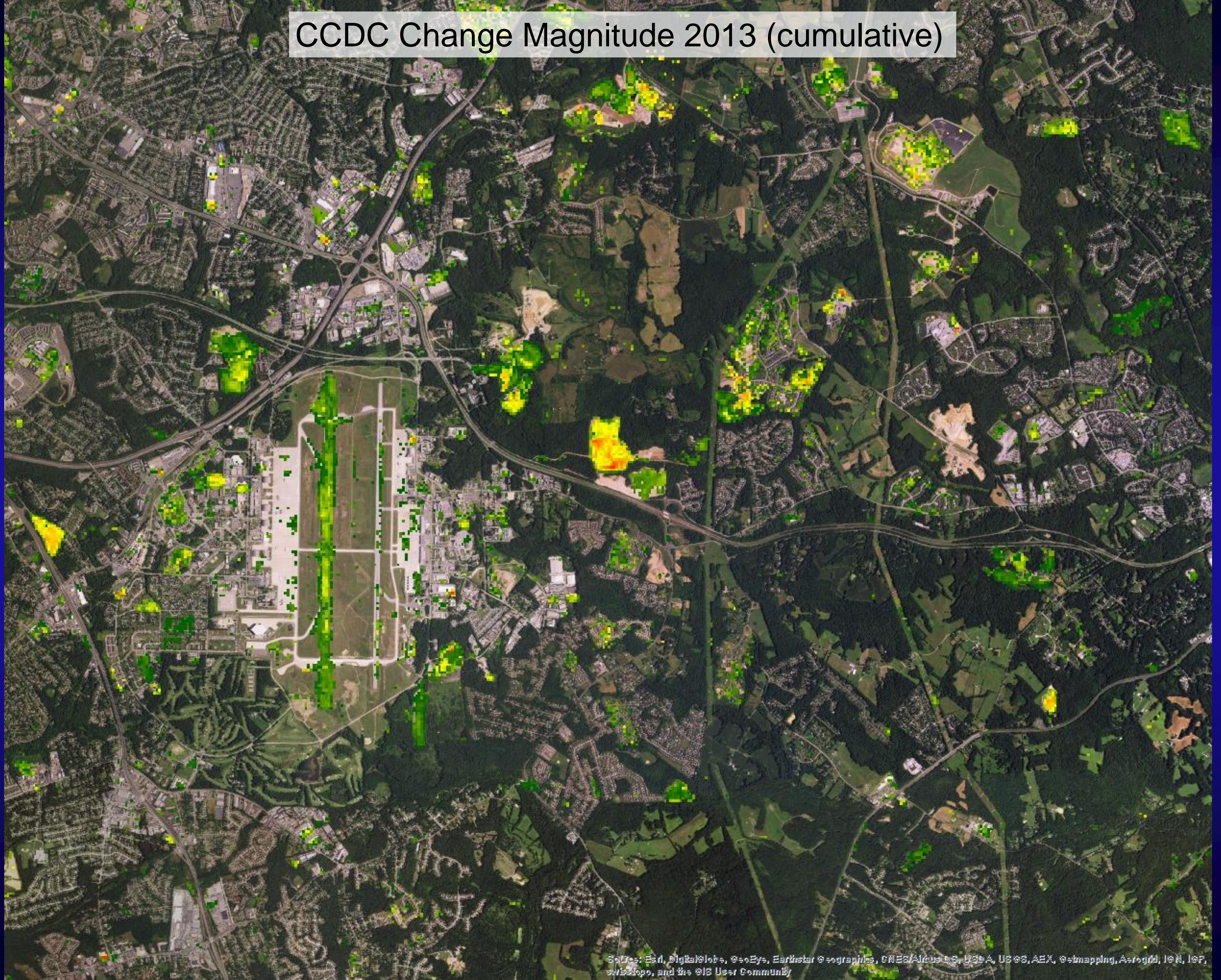


# CCDC Change Magnitude 2012 (cumulative)





# CCDC Change Magnitude 2013 (cumulative)

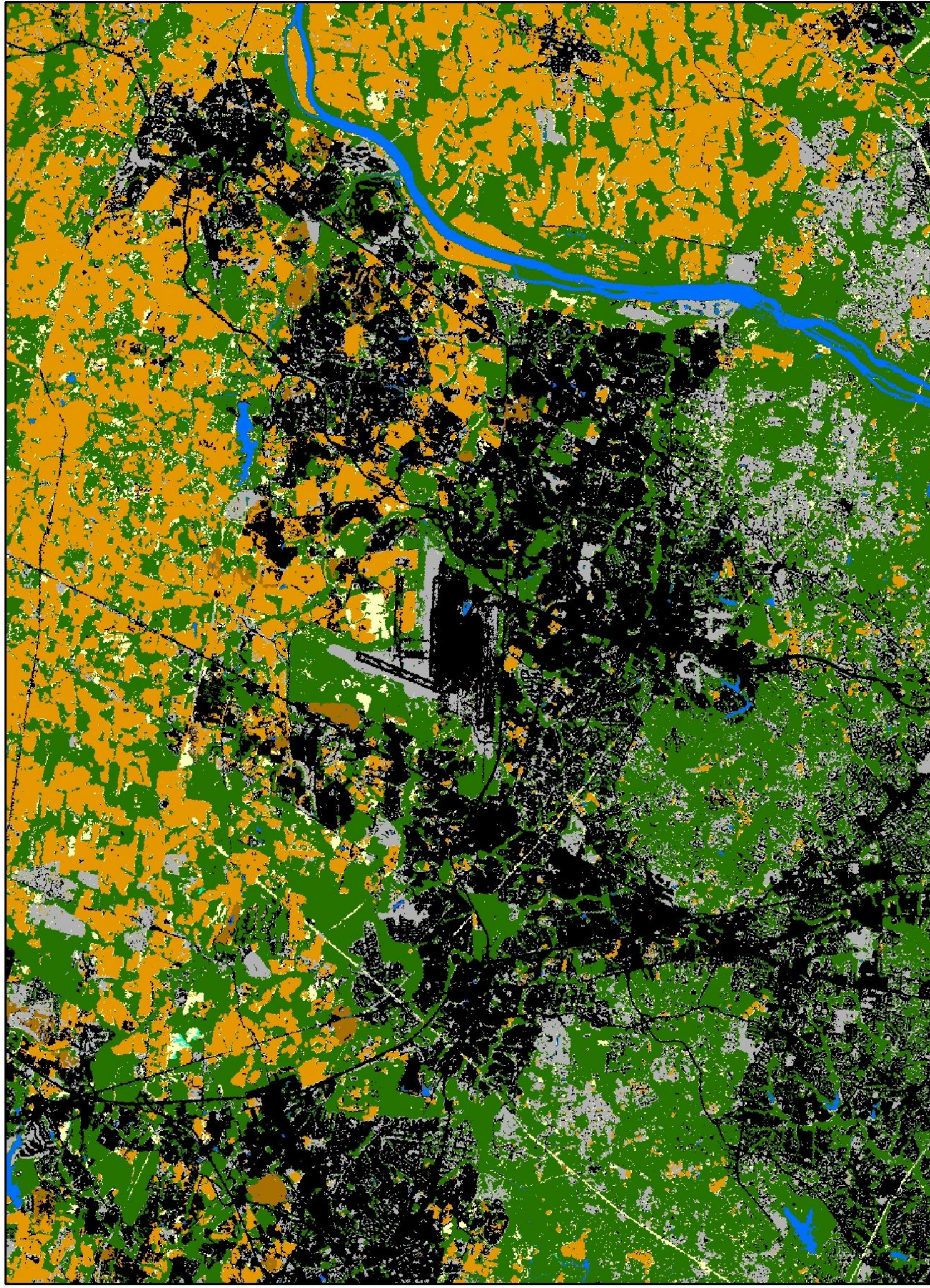




1984



2011





# Incorporating Ag Census into P6 Land Uses

## (at LRSEG scale)

1. Interpolate Ag Census cropland and pasture/hay acres annually, 1984 – 2013.
2. Allocate Census crop acres to LRSEGs based on % of a county's crop within each LRSEG.
3. Allocate Census pasture/hay acres to LRSEGs based on % of a county's pasture/hay within each LRSEG.
4. Allocate Census feeding operations to LRSEGs based on % of a county's total agriculture within each LRSEG.



# Incorporating Ag Census into P6 Land Uses

## (at LRSEG scale)

5. Use 2012 Census standard errors to represent initial Cropland and Pasture accuracies for all Census years in consultation with NASS.
6. Multiply Census accuracies by herbaceous mapping accuracies to derive final Cropland and Pasture accuracies.
7. Apply these accuracies to Turf Grass and Mixed Open land uses too.
8. Rely on just the land cover mapping accuracies for all other P6 classes.
9. To “fit” the Census of Agriculture, increase or decrease acreages for all classes in proportion to their relative errors to ensure the total land use acreages equal the total LRSEG acres.



# Incorporating Ag Census into P6 Land Uses

Available Acres for Agriculture EXCEEDED					
LRSEG	Mapped Land Use	Acres	Accuracy	Error Acres	New Acres
N24015EU1_2810_0001	Roads	10	95%	1	10
N24015EU1_2810_0002	Impervious Other	40	95%	2	39
N24015EU1_2810_0003	Turf Grass	60	72%	17	50
N24015EU1_2810_0004	Mixed Open	20	72%	6	17
N24015EU1_2810_0005	Forest	100	95%	5	97
N24015EU1_2810_0006	Wetlands	10	95%	1	10
N24015EU1_2810_0010	Tree Canopy	30	95%	2	29
N24015EU1_2810_0011	Crops (Ag Census)	200	72%	56	166
N24015EU1_2810_0012	Pasture (Ag Census)	100	72%	28	83
Total Land Use Acres		570		116	500
Total LRSEG Acres		500			
	Is it Herbaceous	*	NASS Standard Error		Final Accuracy
Ag Census Accuracy:	90%	*	80%	=	72%



# Incorporating Ag Census into P6 Land Uses

Available Acres for Agriculture ACCOMMODATED					
LRSEG	Mapped Land Use	Acres	Accuracy	Error Acres	New Acres
N24015EU1_2810_0001	Roads	10	95%	1	10
N24015EU1_2810_0002	Impervious Other	40	95%	2	42
N24015EU1_2810_0003	Turf Grass	60	72%	17	73
N24015EU1_2810_0004	Mixed Open	20	72%	6	24
N24015EU1_2810_0005	Forest	100	95%	5	104
N24015EU1_2810_0006	Wetlands	10	95%	1	10
N24015EU1_2810_0010	Tree Canopy	30	95%	2	31
N24015EU1_2810_0011	Crops (Ag Census)	150	72%	42	182
N24015EU1_2810_0012	Pasture (Ag Census)	20	72%	6	24
Total Land Use Acres		440		80	500
Total LRSEG Acres		500			
	Is it Herbaceous	*	NASS Standard Error		Final Accuracy
Ag Census Accuracy:	90%	*	80%	=	72%