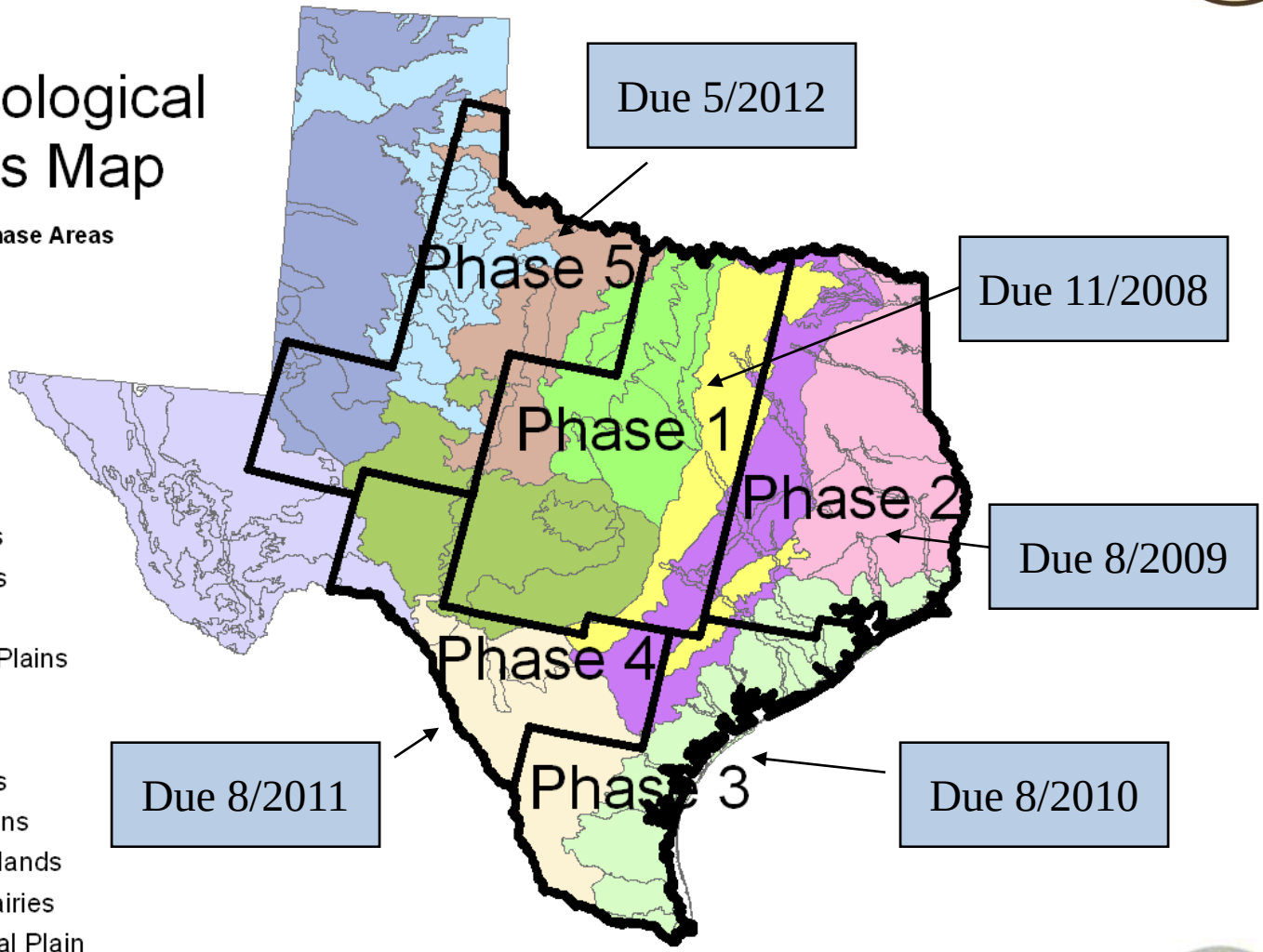
Texas Ecological Systems Map

Proposed Phase Areas



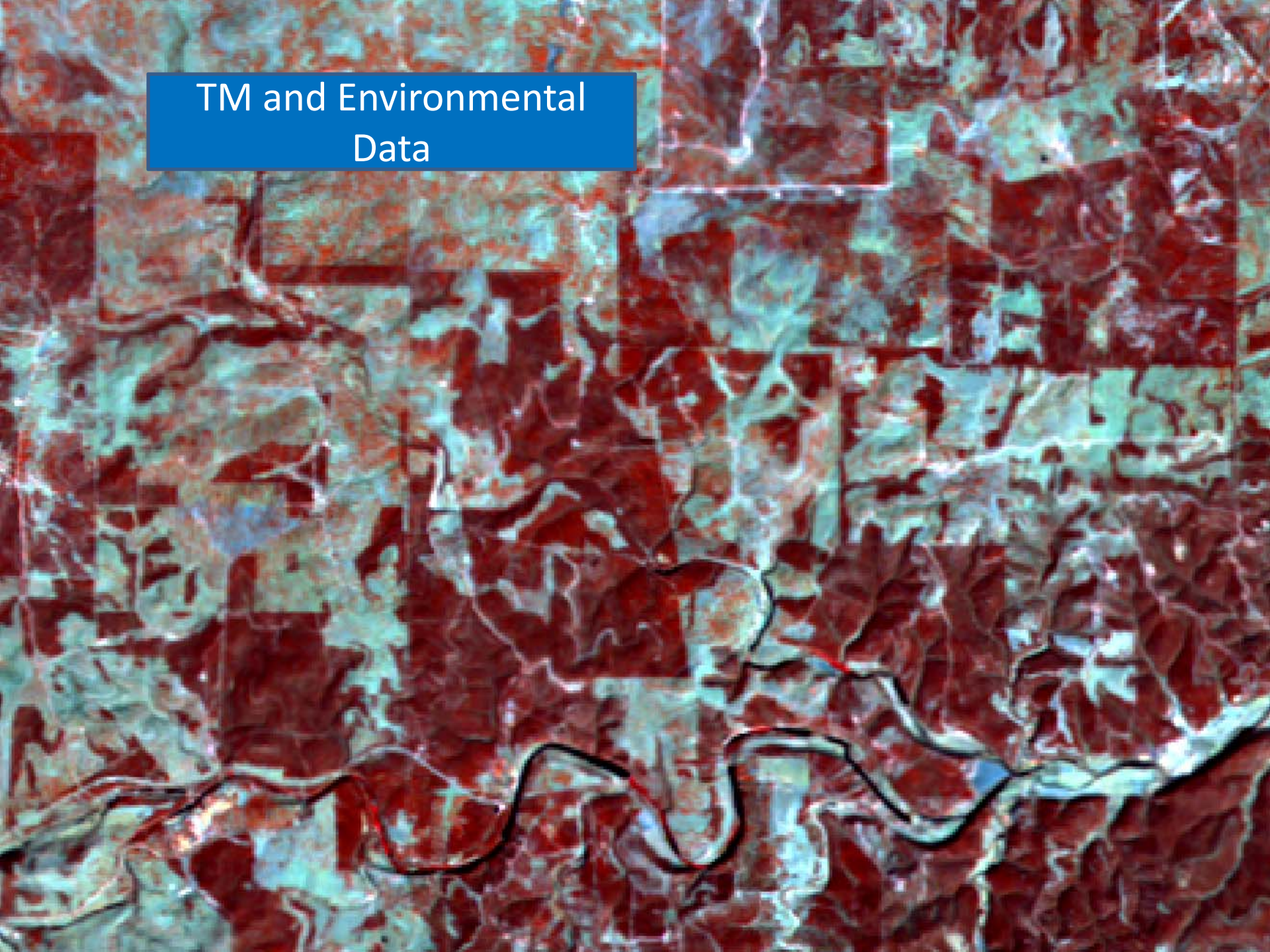
Ecoregion

- Central Great Plains
- Chihuahuan Deserts
- Cross Timbers
- East Central Texas Plains
- Edwards Plateau
- High Plains
- South Central Plains
- Southern Texas Plains
- Southwestern Tablelands
- Texas Blackland Prairies
- Western Gulf Coastal Plain

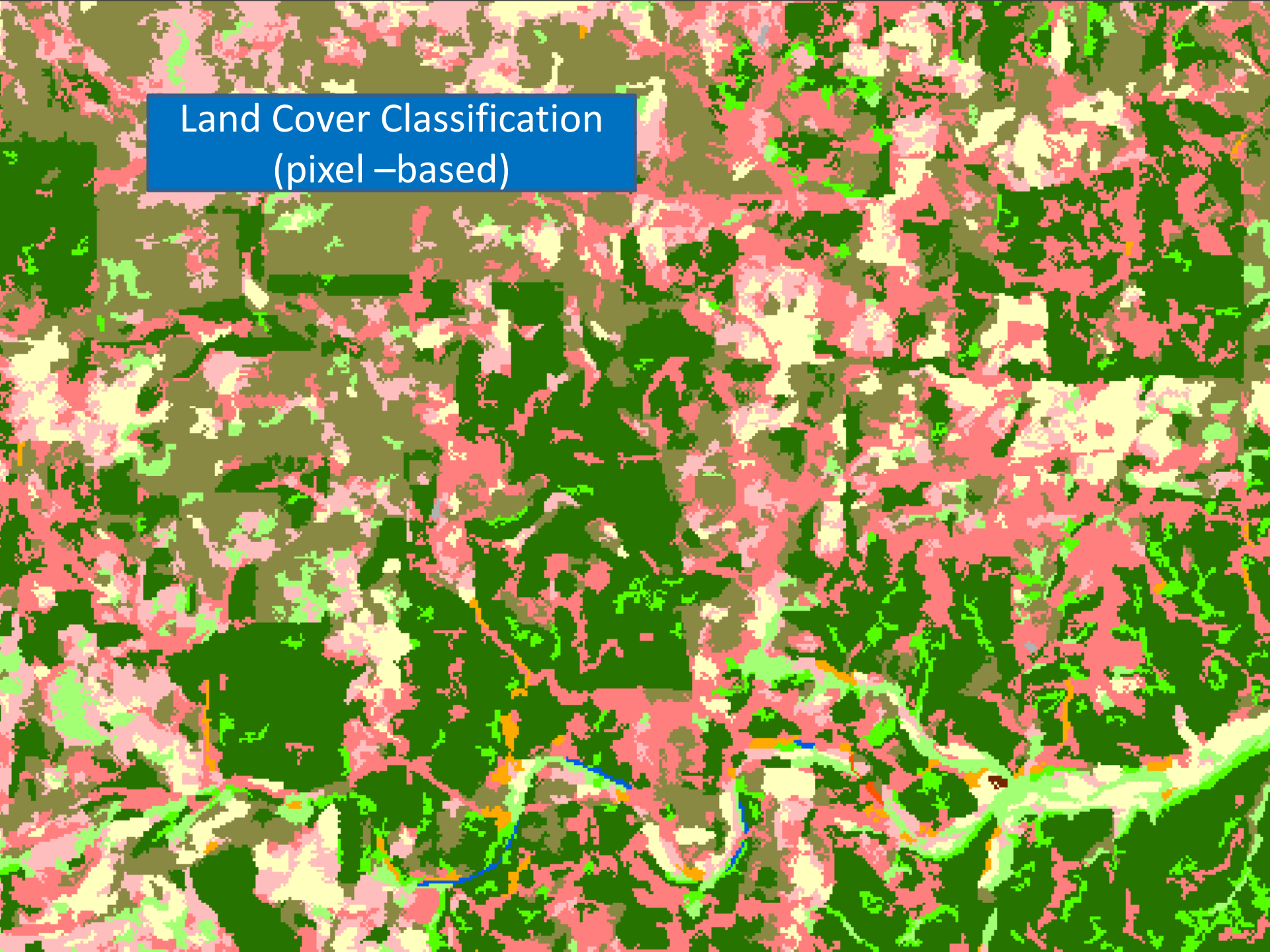
Texas Land Cover Project Up-date after Phase 1 April 2009

- Increase spatial resolution(10 m vs 30 m) and thematic resolution (20 classes vs >150 classes)
- Remote Sensing generates land cover
  - Decision tree incorporates abiotic data directly
  - Training data from NAIP and ground points
  - Use of objects indirectly from NAIP (10 m)
- Modeling generates final mapped vegetation
  - Mapping targets are modified from NatureServe
  - Soils, slope, landform, and ecoregions are overlain on land cover to map targets (7 to 10 times more classes vs land cover alone)

TM and Environmental Data

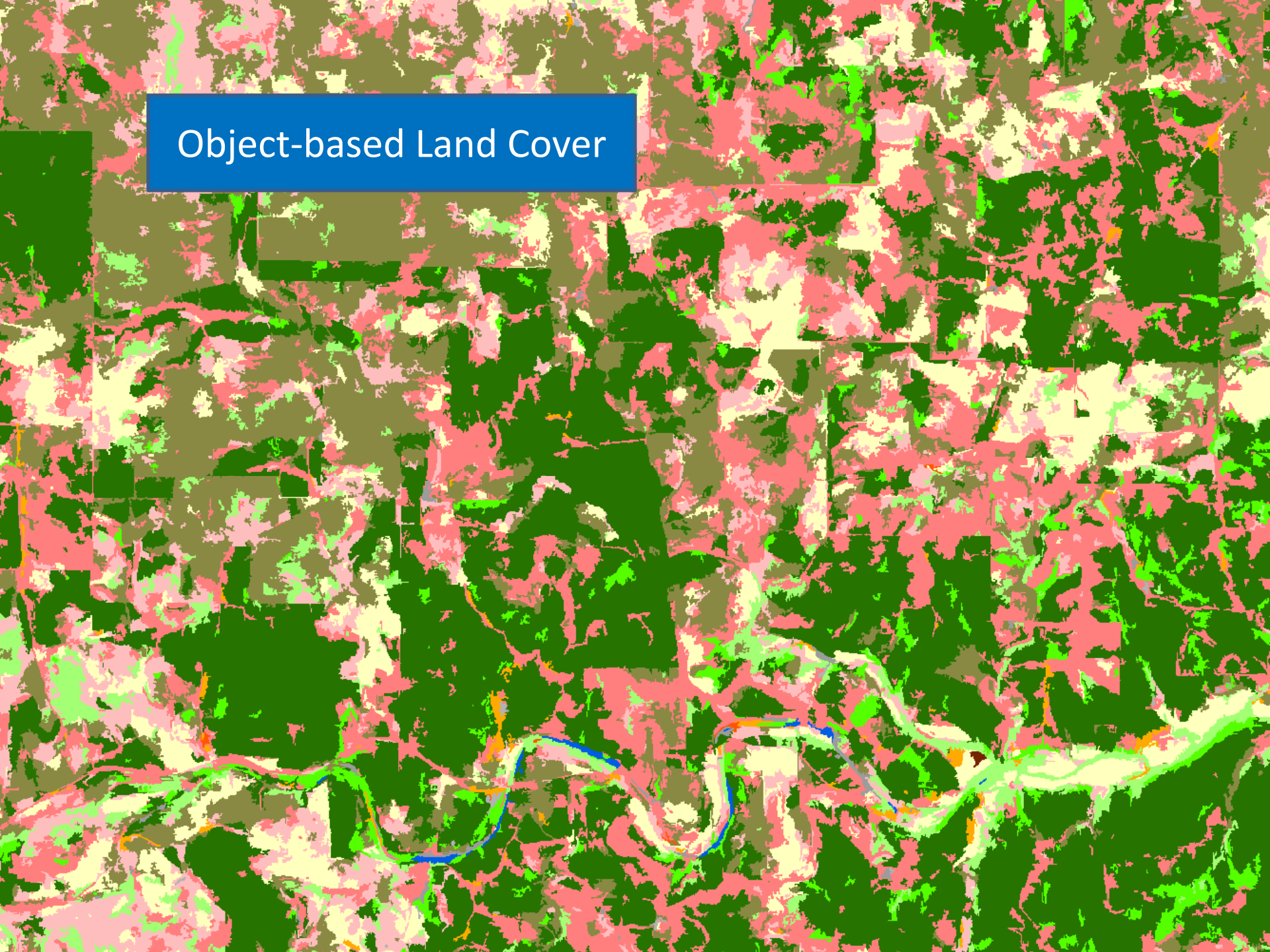


Land Cover Classification (pixel –based)

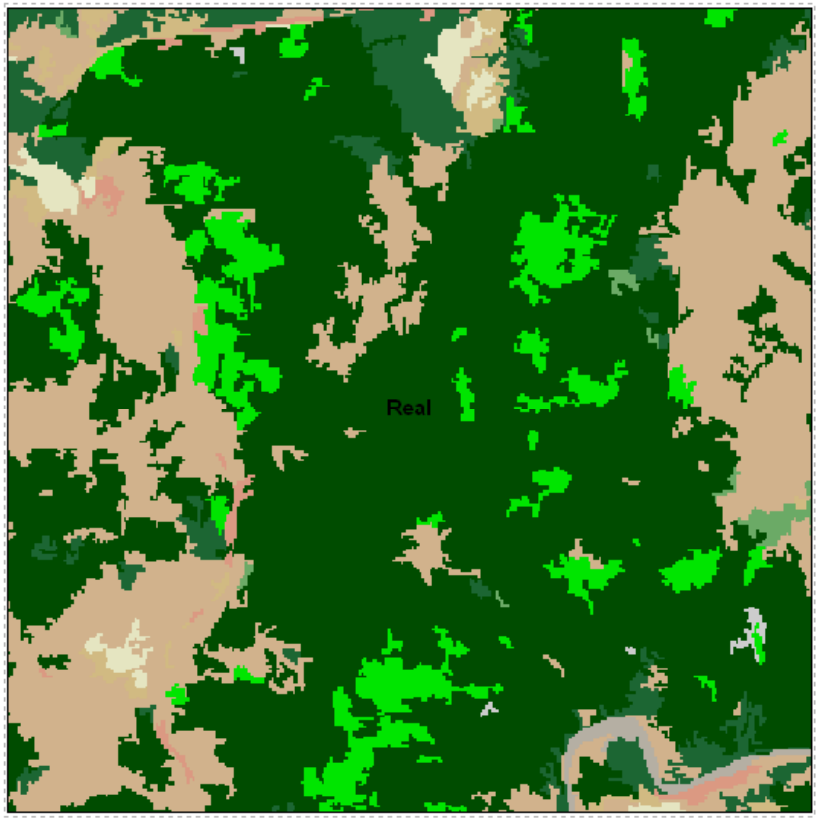


Objects at 10 m resolution

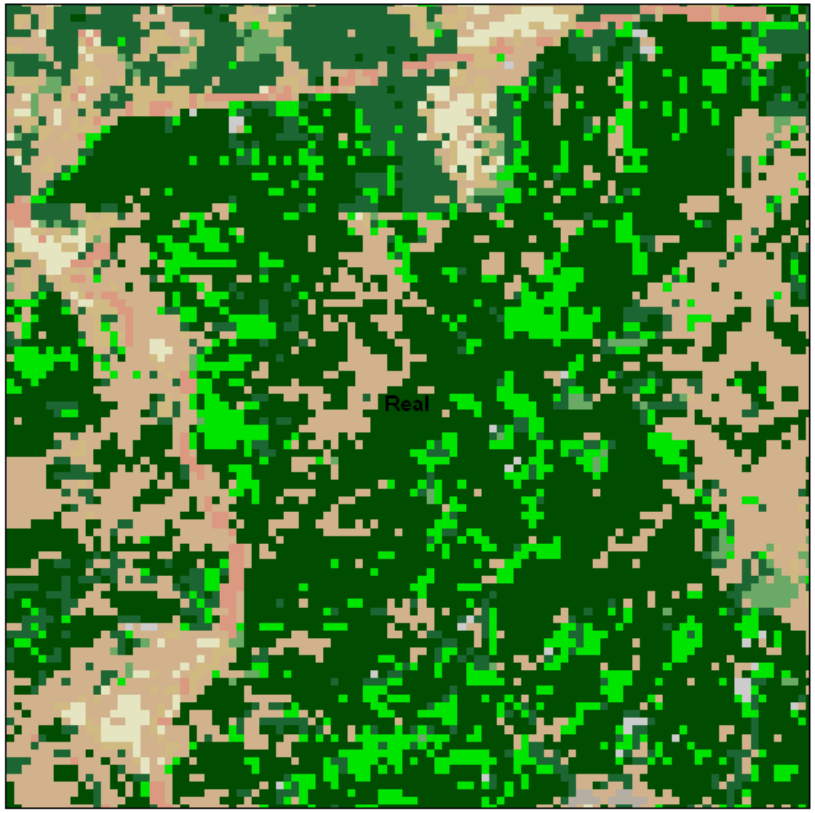
Object-based Land Cover



Object Based



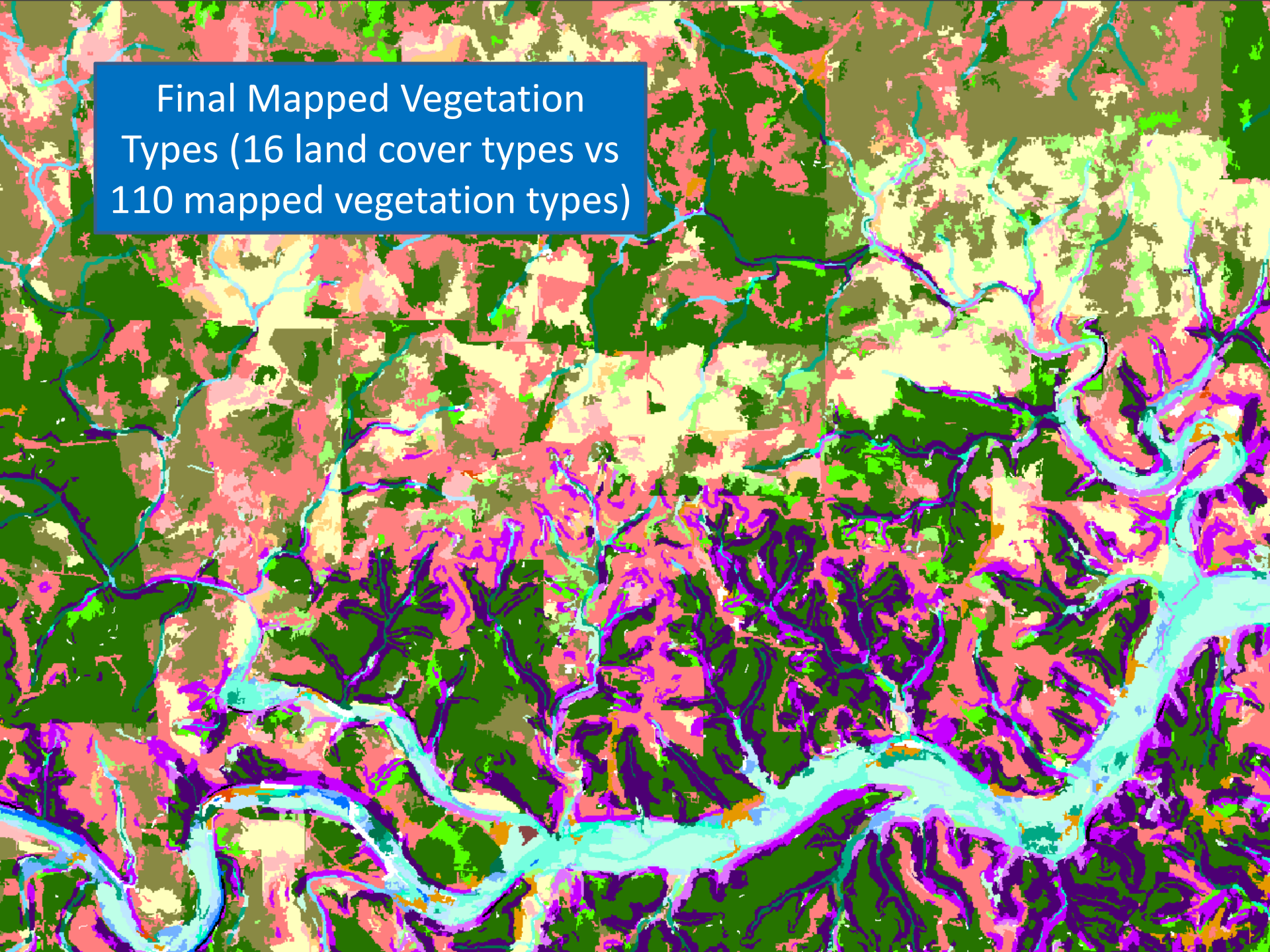
Pixel Based



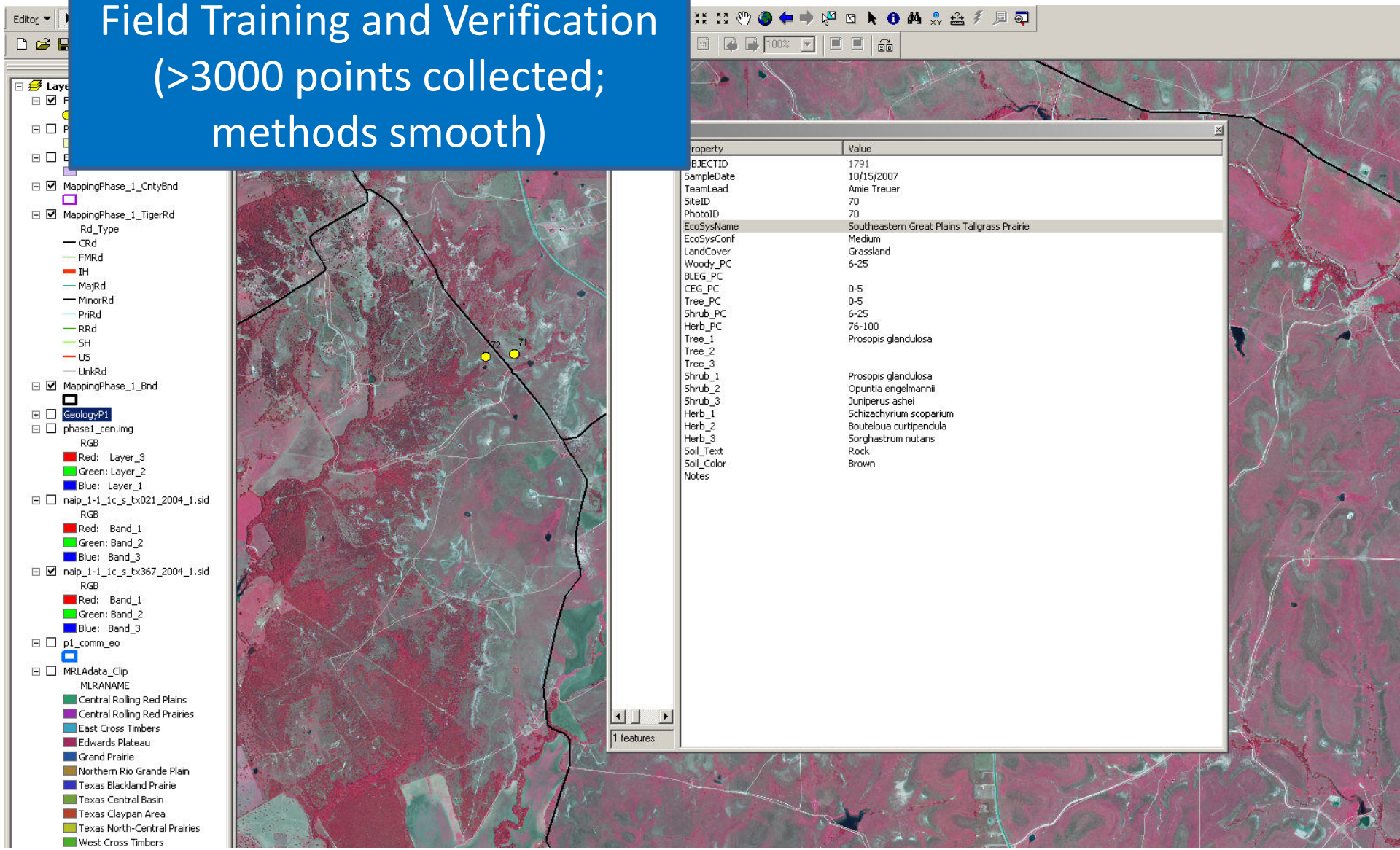
SSURGO Soil Groups or
Ecological Site Types

Slopes >20%

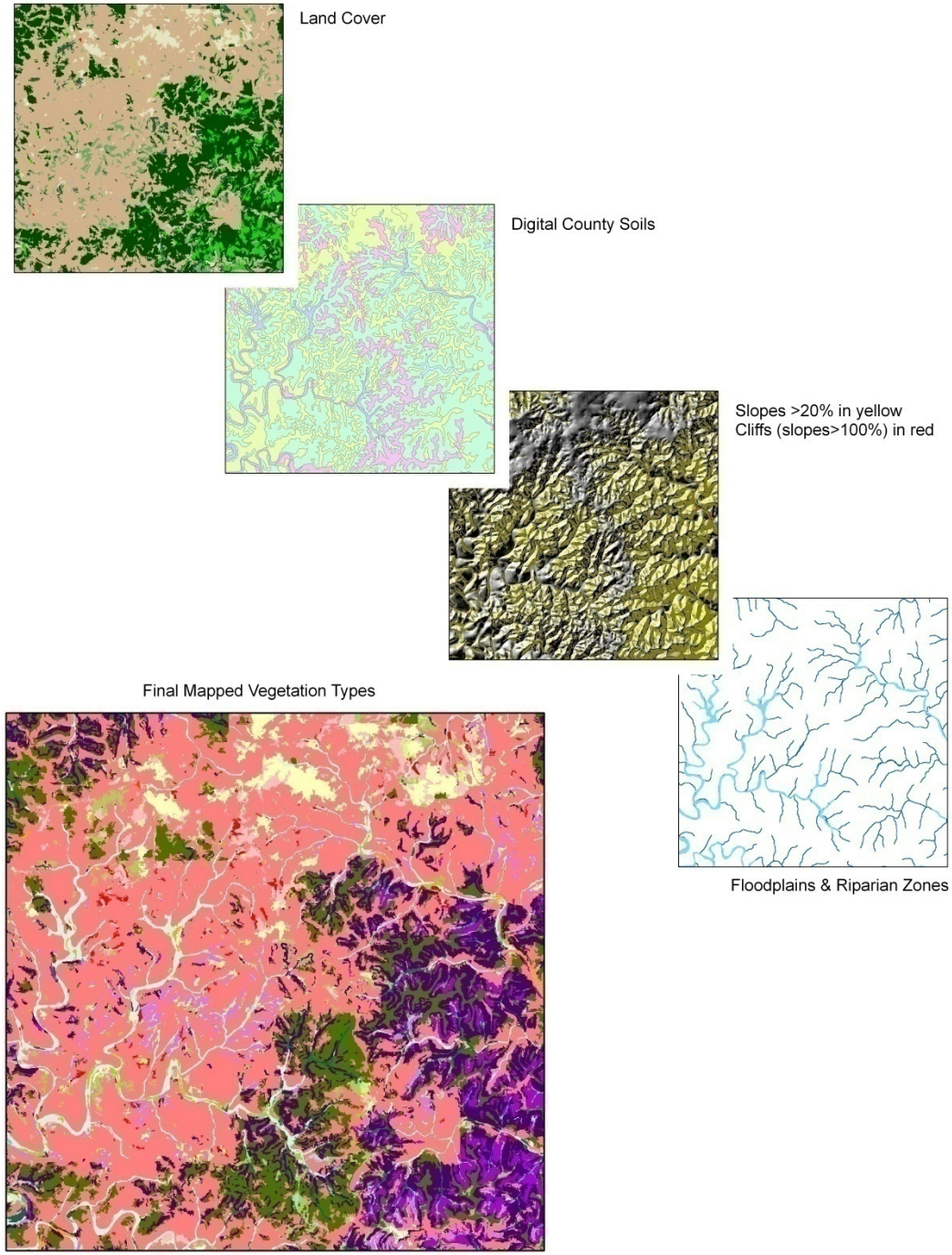
Final Mapped Vegetation Types (16 land cover types vs 110 mapped vegetation types)



Field Training and Verification (>3000 points collected; methods smooth)

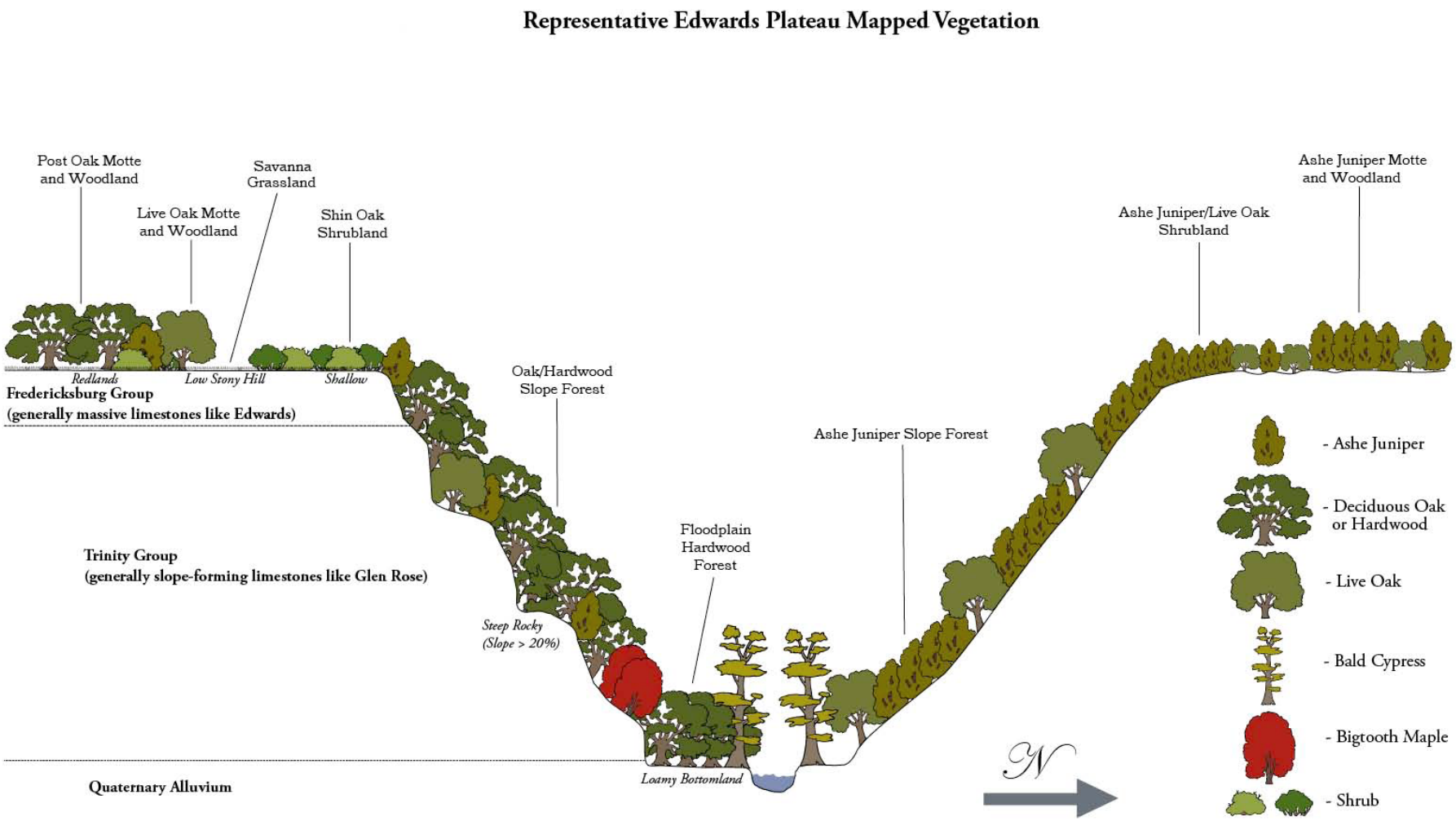


Ecosystem Modeling



- Interpret current land cover using NRCS soils Ecological Site Types
- Add slope & cliff classes from 10 m DEM
- Model riparian classes from hi-res NHD
- Determine floodplain classes from soils

Modeling Mapped Subsystems



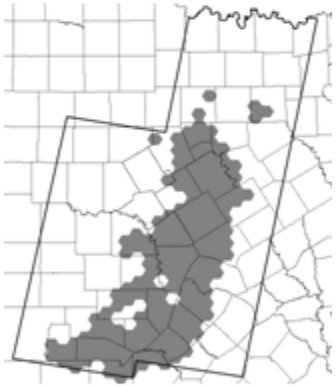
Edwards Plateau: Deciduous Oak / Evergreen Motte and Woodland

Area in Phase 1: 680,115 acres (275,230 ha)

Description of Mapped Type: This mixed woodland type contains significant variation, but deciduous oaks such as Texas oak, white shin oak, or lacey oak (west) are often important in the overstory, together with Ashe juniper, plateau live oak, cedar elm, or sugar hackberry. The understory often contains Ashe juniper and plateau live oak, and Texas persimmon, agarito, and Texas mountain-laurel are common.

Interpretive Booklet in Review

Where to Visit:



Balcones Canyonland National Wildlife Refuge: U. S. Fish and Wildlife Service

Government Canyon State Natural Area: Texas Parks and Wildlife Department

Dinosaur Valley State Park: Texas Parks and Wildlife Department

Barton Creek Habitat Preserve: The Nature Conservancy

Honey Creek State Natural Area: Texas Parks and Wildlife Department

Pedernales Falls State Park: Texas Parks and Wildlife Department

Guadalupe River State Park: Texas Parks and Wildlife Department

Barton Creek Greenbelt: City of Austin

Meridian State Park: Texas Parks and Wildlife Department

Ecological Systems Classification

1383 Edwards Plateau Limestone Savanna and Woodland (CES303.660)

Classifiers

Conf.: 2 - Moderate **Classification Status:** Standard
Primary Division: Western Great Plains (303)
Land Cover Class: Forest and Woodland
Spatial Scale & Pattern: Large patch
Required Classifiers: Natural/Semi-natural; Vegetated (>10% vasc.); Upland
Non-Diagnostic Classifiers: Forest and Woodland (Treed); Ridge/Summit/Upper Slope; Sedimentary Rock; Temperate [Temperate Continental]; Unglaciated; Alkaline Soil; Calcareous; Ustic
FGDC Crosswalk: Vegetated, Tree-dominated, Closed tree canopy, Mixed evergreen-deciduous closed tree canopy
National Mapping Codes: EVT 2383; ESLF 4326; ESP 1383

Concept

Summary: This upland system occurs primarily on limestone soils in the Edwards Plateau and forms the matrix within this ecoregion. It can also occur on limestone in the shortgrass regions of Texas and north into Oklahoma in areas such as the Arbuckle Mountains. This system is typified by a mosiac of evergreen oak forests, woodlands and savannas over shallow soils of rolling uplands and adjacent upper slopes within the Edwards Plateau and Lampasas Cutplain. Species such as *Quercus fusiformis* or *Juniperus ashei* dominate the canopy of this system. Other species may include *Quercus buckleyi, Quercus laceyi, Ulmus crassifolia, Fraxinus texensis, Quercus sinuata, Quercus vaseyana*, and *Diospyros texana*. Certain uplands have mottes of *Quercus fusiformis* dominating savanna-like woodlands. Understory species can contain various species of *Bouteloua, Schizachyrium scoparium, Nassella leucotricha*, and/or *Carex planostachys*. Grasslands dominated by *Schizachyrium scoparium* occur in small patches within more closed woodlands and in larger patches in open savanna-like woodlands with scattered trees. Grasslands in this system tend to grade from short-grass communities in the west to mixed-grass communities to the east. Substrate (limestone) determines the range of this system within given examples. Some disturbed areas on hard-bedded limestone of the western plateau are now dominated by mesquite woodland. Natural mesquite woodlands are believed to have occurred on the deeper soils of adjacent riparian systems.
Classification Comments: Distribution in Oklahoma needs to be reviewed. This system is described as a mosaic of grassland and woodland communities.
Similar Ecologi

- Edwards Plat
- Llano Uplift

Technical Descriptions of all Ecological Systems

Edwards Plateau: Ashe Juniper Motte and Woodland (35)
Edwards Plateau Limestone Ashe Juniper Motte and Woodland

Description: These relatively closed woodlands are very common on uplands on limestone in the Edwards Plateau and adjacent ecoregions. *Juniperus ashei* (Ashe juniper) is the clear dominant in the canopy and a conspicuous component of the shrub layer as well. Occurrences containing thick stands of juniper are sometimes referred to as "cedar breaks." *Quercus fusiformis* (plateau live oak) is often a significant component in the canopy, and other species such as *Quercus buckleyi* (Texas oak), *Quercus sinuata* var. *breviloba* (white shin oak), *Quercus vaseyana* (Vasey shin oak), *Quercus laceyi* (Lacey oak), *Ulmus crassifolia* (cedar elm), and *Celtis* spp. (hackberry) may also be common. The shrub layer may be dense and dominated by *Juniperus ashei* (Ashe juniper), but *Mahonia trifoliolata* (agarito), *Diospyros texana* (Texas persimmon), and other species may be present. Dense canopy cover often leads to a sparse to nearly absent herbaceous layer, sometimes with only *Carex planostachys* (cedar sedge) present. In the southwestern portion of the Edwards Plateau, *Pinus remota* (papershell pinyon) and *Quercus laceyi* (Lacey oak) may be a common in the overstory. These sites tend to appear more open, but retain *Juniperus ashei* (Ashe juniper) as a significant component of the overstory and shrub layers. Pinyon woodlands tend to occur on relatively xeric sites and have a sparse herbaceous layer with species such as *Bouteloua curtipendula* (sideoats grama), *Hilaria belangeri* (curlymesquite), *Erioneuron pilosum* (hairy tridens), and others. Approximately 16% of the system consists of this vegetation type.

Important Lessons

- Use of See5 decision trees for classification
- Generation of training data from NAIP
- Generation of image objects from eCognition using NAIP
- Interpretation of SSURGO soils for modeling; soils data need correction
- Generation of DEM-based variables for classification and modeling
- GIS techniques for modeling
- Generation of interpretive materials