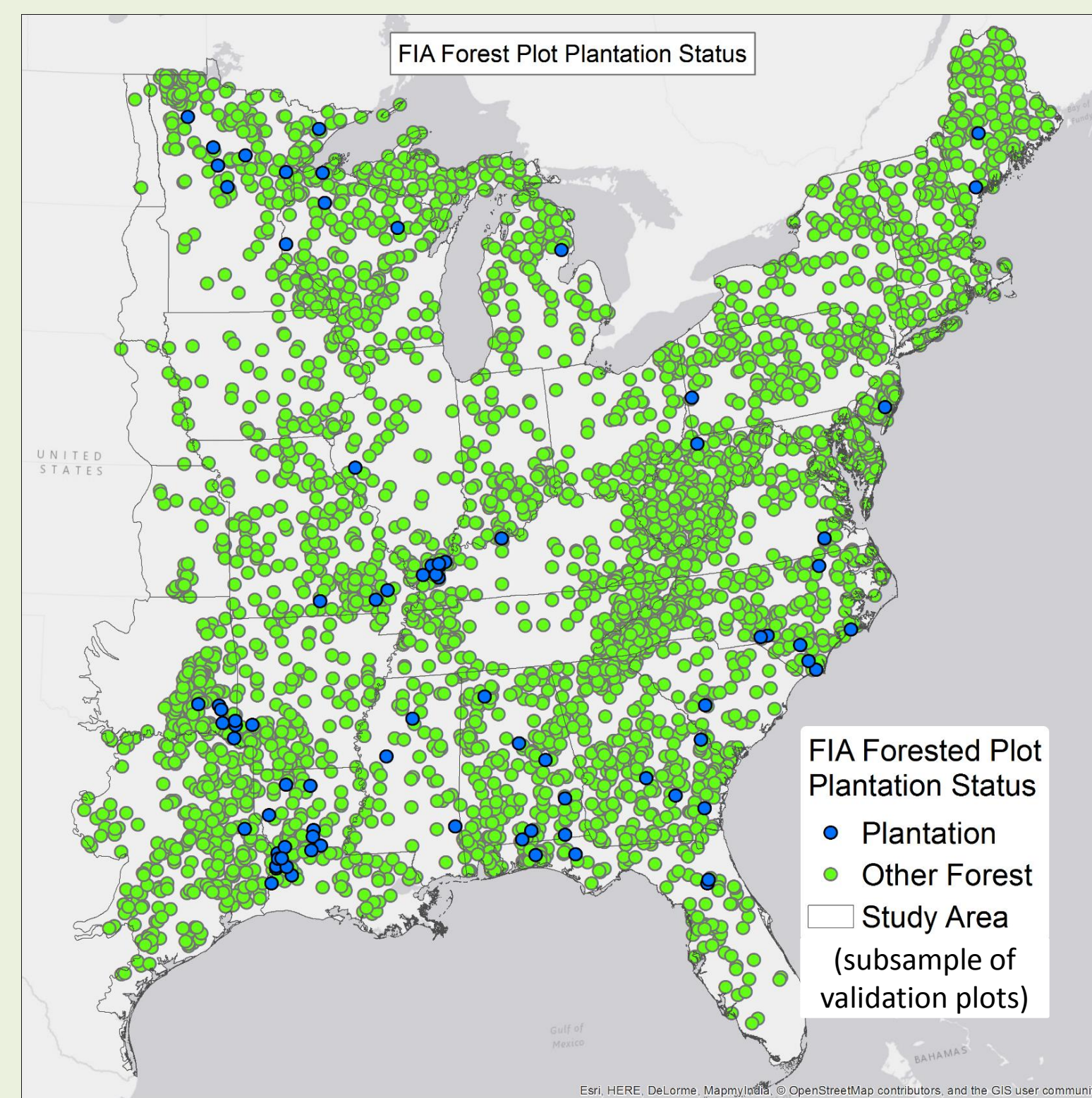


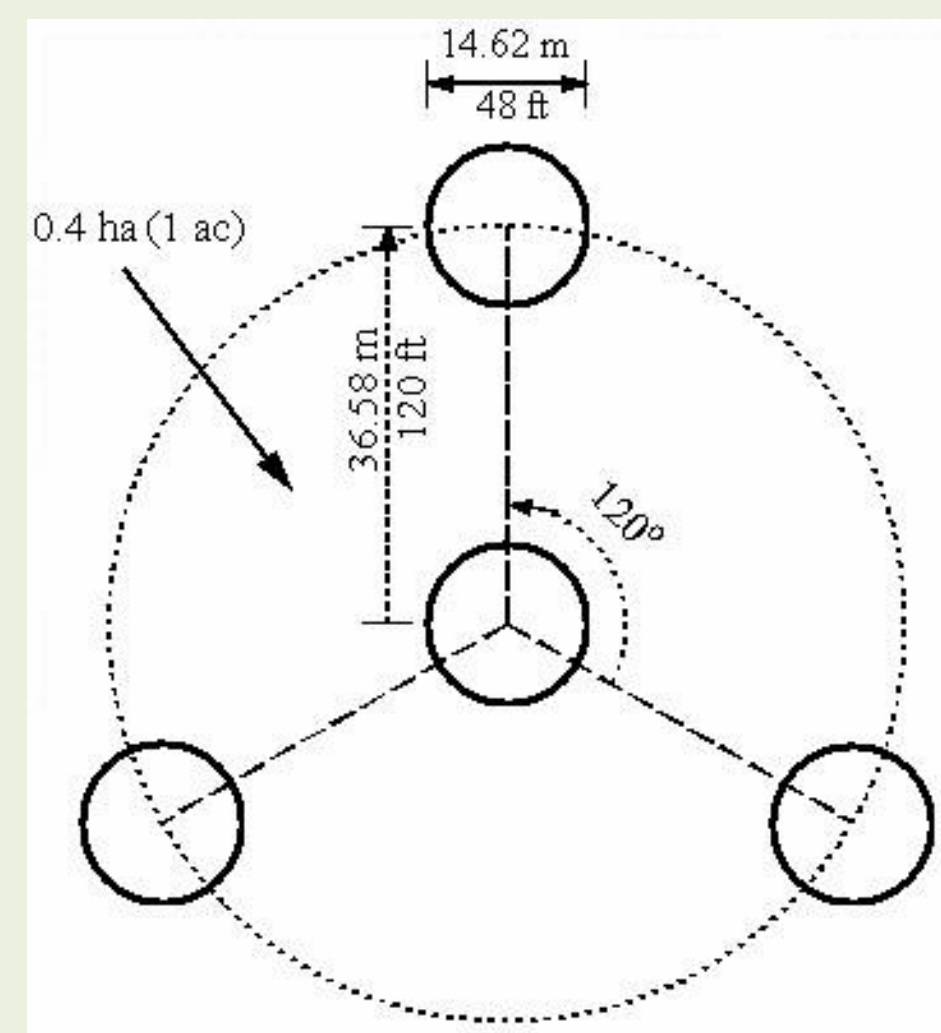
NatureServe and FIA have developed a computerized algorithm (key) for assigning USNVC natural forest macrogroups and forest plantations to FIA data. This integration increases the utility of FIA by sharing data with partners, reporting forest area estimates by NVC type, and relating FIA to other NVC-based datasets, such as wildlife-habitat matrices. All forested P2 plots **in the eastern U.S.** can now be classified to macrogroup and plantation type.

The U.S. Department of Agriculture, Forest Service's **Forest Inventory and Analysis Program (FIA)** provides nationwide data, information, and knowledge on forest composition and structure, a rich resource for assessment and conservation.

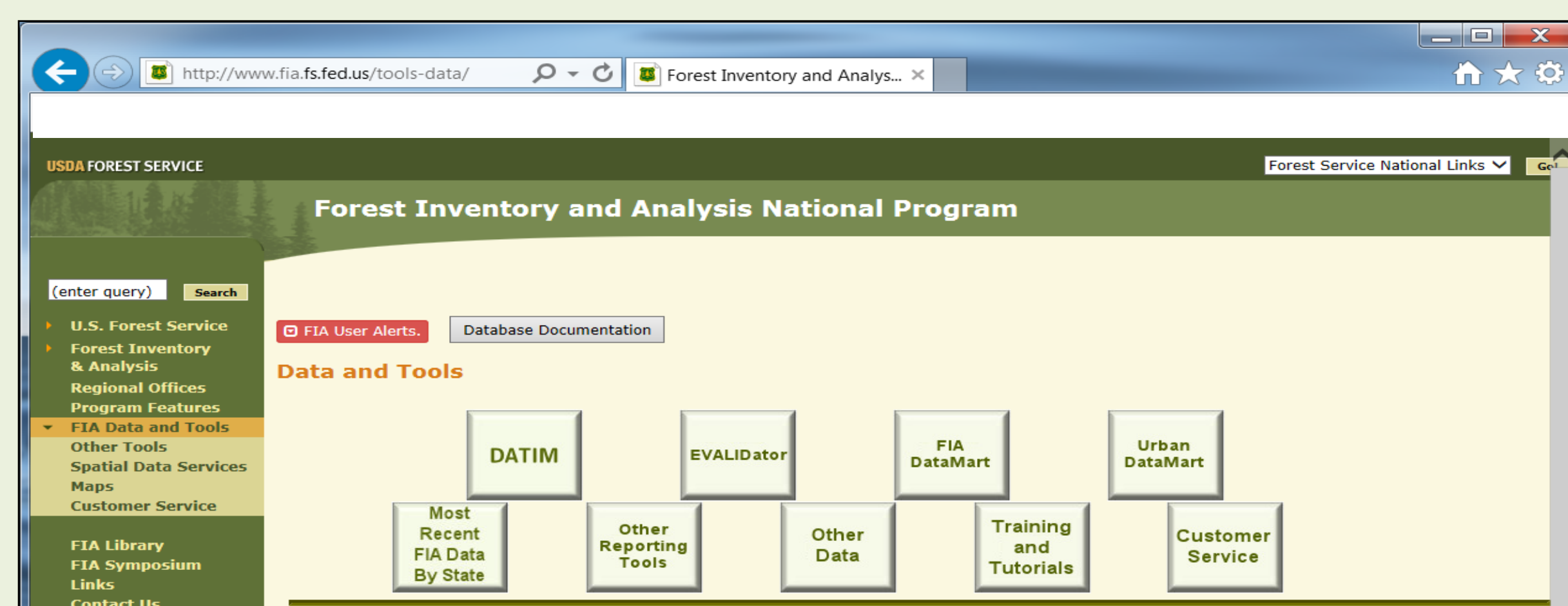


- FIA "Phase 2" (P2) plots provide a statistically representative field sample of forests across all ownership categories of the U.S.
- Over 160,000 permanent P2 FIA plots are distributed across the eastern U.S.
- About 45 percent of the area is forested, with nearly 138 million hectares of 'natural' forest and 22 million hectares of 'plantation' (stands with clear evidence of artificial regeneration).

- Each FIA cluster-plot consists of one central and three peripheral subplots which are remeasured once per reporting cycle. Mensurational variables are collected at the plot, subplot, condition (stand/patch), and individual tree level.

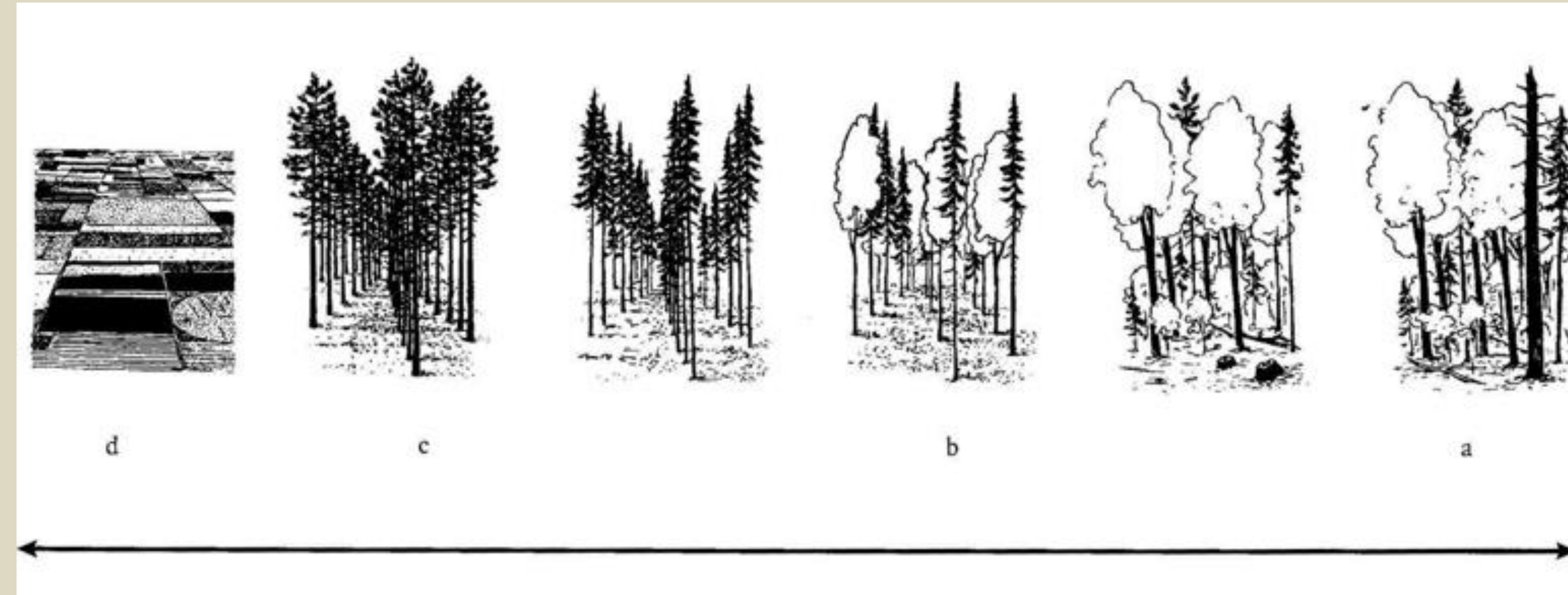


- FIA products are temporally and spatially scalable, and publicly distributed in various forms on the FIA website:
<http://www.fia.fs.fed.us/>



U.S. National Vegetation Classification

The U.S. National Vegetation Classification (USNVC) system integrates ecological and cultural factors into 8-level hierarchies of cultural and natural types that comprise a federal standard for reporting vegetation information (see usnvc.org).



Forest are shaped by a combination of natural and cultural processes, leading to a range of conditions from (semi-) natural forest (a), to forest plantation (c) (adapted from Palik and Engstrom 1999, Fig. 3.4)

- For natural forests, we use the macrogroup (level 5) concepts, based on tree, shrub and herb species and their response to ecological factors (Table 1).
- For forest plantations, we use the cultural type (level 7) concepts, based largely on dominant planted species (Table 1).

Table 1. List of 27 macrogroups and 11 plantation types in eastern U.S. (some names abbreviated)

1. FOREST & WOODLAND	7. AGRICULTURAL & DEVELOPED VEGETATION
1.A.1. Tropical Dry Forest & Woodland	7.A.2. FOREST PLANTATION & AGROFORESTRY
M134. Caribbean Coastal Lowland Dry Forest	CTY009. Native Northern Pine Plantation
1.A.5. Mangrove	CTY010. Native Northern Spruce-Fir Plantation
M005. Western Atlantic & Caribbean Mangrove	CTY011. Native Miscellaneous Northern Conifer Plantation
1.B.1. Warm Temperate Forest & Woodland	CTY012. Native Southern Pine Plantation
M007. Longleaf Pine Woodland	CST013. Native Miscellaneous Southern Conifer Plantation
M885. Southeastern Coastal Plain Evergreen Forest	CTY014. Exotic Northern Conifer Plantation
M008. Southern Mesic Mixed Broadleaf Forest	CTY015. Exotic Southern Conifer Plantation
M305. Southeastern North American Ruderal Forest	CTY016. Native Northern Hardwood Plantation
1.B.2. Cool Temperate Forest & Woodland	CTY017. Native Southern Hardwood Plantation
M016. Southern & South-Central Oak - Pine Forest & Woodland	CTY018. Exotic Northern Hardwood Plantation
M502. Appalachian-Northeastern Oak - Hardwood - Pine Forest	CTY019. Exotic Southern Hardwood Plantation
M883. Appalachian-Interior-Northeastern Mesic Forest	
M012. Central Midwest Oak Forest, Woodland & Savanna	
M882. Central Midwest Mesic Forest	
M159. Laurentian-Acadian Pine - Hardwood Forest & Woodland	
M014. Laurentian-Acadian Mesic Hardwood - Conifer Forest	
M013. Eastern North American Ruderal Forest	
M151. Great Plains Forest & Woodland	
1.B.3. Temperate Flooded & Swamp Forest	
M029. Central Hardwood Floodplain Forest	
M503. Central Hardwood Swamp Forest	
M504. Laurentian-Acadian-North Atlantic Coastal Flooded & Swamp Forest	
M028. Great Plains Flooded & Swamp Forest	
M302. Eastern North American Ruderal Flooded & Swamp Forest	
M161. Pond-cypress Basin Swamp	
M033. Southern Coastal Plain Basin Swamp & Flatwoods	
M032. Southern Coastal Plain Evergreen Hardwood - Conifer Swamp	
M031. Southern Coastal Plain Floodplain Forest	
M154. Southern Great Plains Floodplain Forest & Woodland	
M310. Southeastern North American Ruderal Flooded & Swamp Forest	
1.B.5. Boreal Flooded & Swamp Forest	
M299. North American Boreal Conifer Poor Swamp	

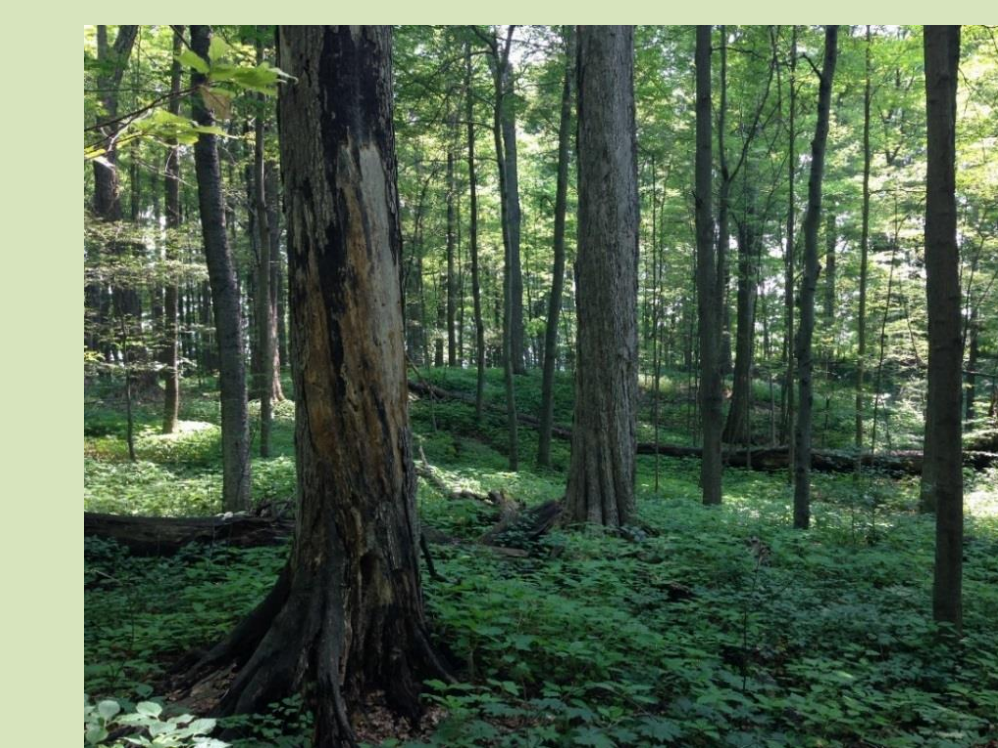
FIA-USNVC Algorithm

- USNVC macrogroup and plantation type was assigned to each FIA forested condition for plots within the eastern United States.
- Assignments were based on a computer algorithm similar to FIA's forest type procedure.
- Because shrub and herb data are not collected on FIA's P2 plots, we supplemented FIA data with ancillary information. Criteria used in each macrogroup assignment include any of the following:

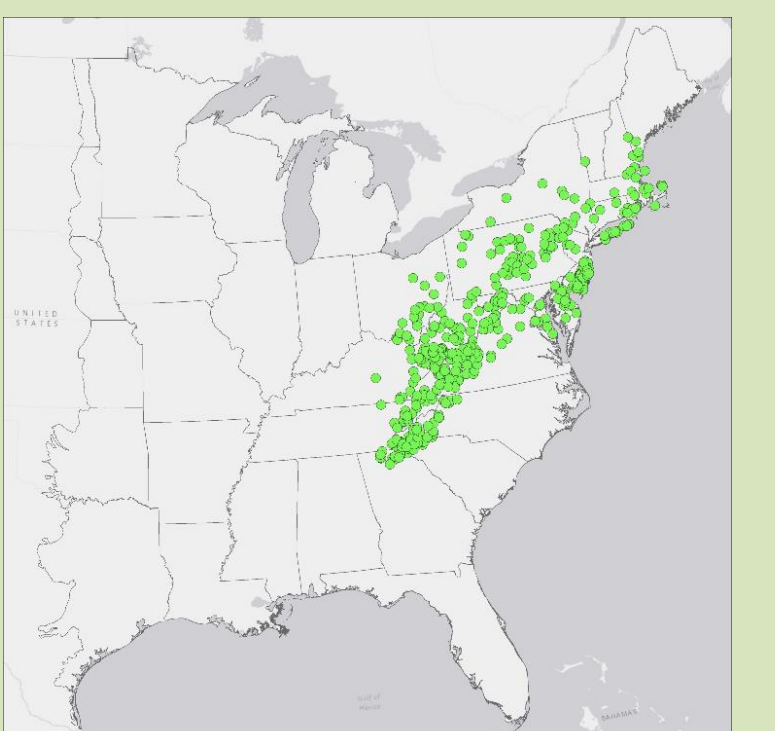
FIA	Plot	ECOSUBCD	Ecosubsection code
FIA	Condition	PHYSCLCD STDORGCD STDORGSP	Physiographic class code (hydric, riverine, other) Stand origin code (natural vs. artificial regeneration) Stand origin species code (planted tree species)
FIA	Tree	SPCD DIA TPA_UNADJ	Tree species code Tree diameter (inches) Trees per acre (unadjusted by plot sampling probability)
NVC	Tree	WETLAND_INDICATOR_SCORE RUDERAL/EXOTIC SOFTWOODHARDWOOD	USFWS wetland indicator status NatureServe status, (intact / disturbed / non-native) S - softwood, H - hardwood

Examples of FIA Plot Data Assigned to Macrogroup.

Appalachian-Northeastern Oak - Hardwood - Pine Forest & Woodland (M502).



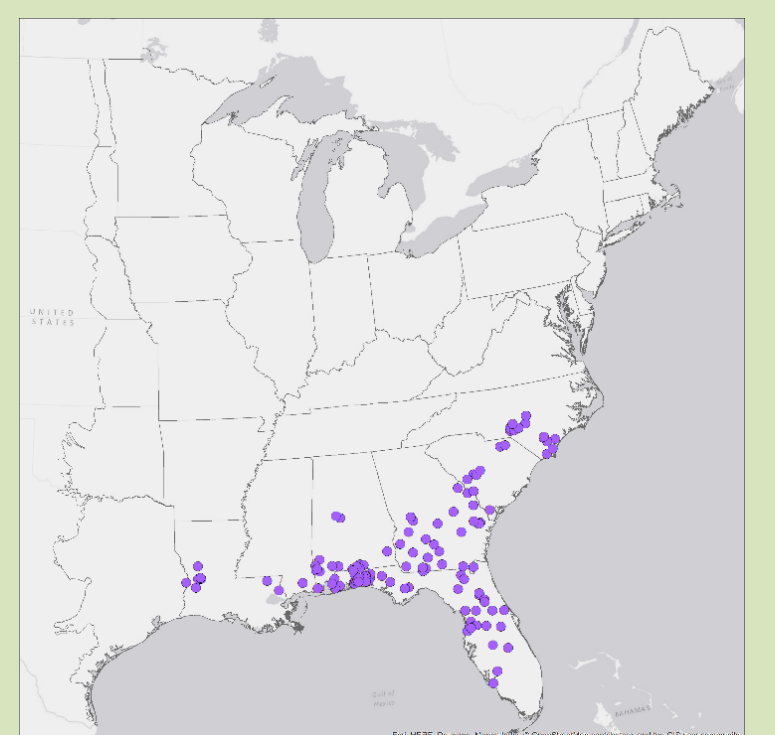
1. Natural and Ruderal Forest
2. Upland Forest & Woodland
3. Temperate & Boreal Forest
4. Eastern North American Temperate & Boreal Forest
5. Eastern North American Forest & Woodland Division
6. Eastern Cool Temperate Natural Forest & Woodland
7. Central Forest macrogroups
8. Appalachian-Northeastern Oak - Hardwood - Pine Forest & Woodland (M502)



Longleaf Pine Woodland (M007)



1. Natural and Ruderal Forest
2. Upland Forest & Woodland
3. Temperate & Boreal Forest
4. Eastern North American Temperate & Boreal Forest
5. Southeastern Longleaf Pine Woodland (M007)



NEXT STEPS: Complete the Key for Western U.S. Forests

For More Information:

Menard, S., D. Faber-Langendoen, M. Nelson, K. Nimerfro, J. Garner, M. Miller, and J. Vissage. 2017. *Integrating the U.S. National Vegetation Classification in the U.S. Forest Service FIA Program*. Report to USFS-FIA program. NatureServe, Arlington, VA. 104 pp.

NatureServe - A Network Connecting Science with Conservation: <http://www.natureserve.org/>
USDA Forest Service, Forest Inventory and Analysis Program: <http://www.fia.fs.fed.us/>
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