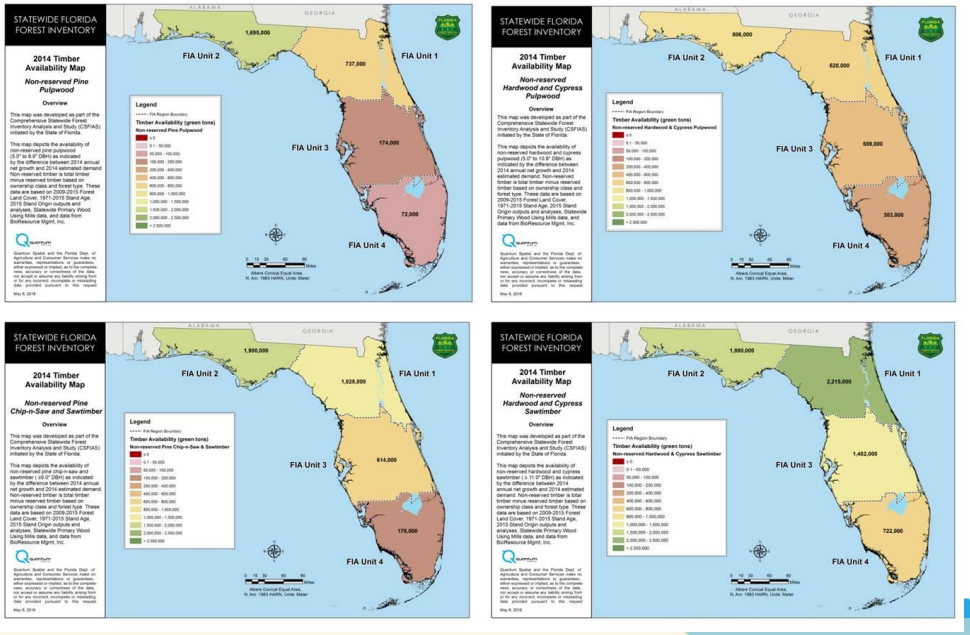
Comprehensive Statewide Forest Inventory Analysis Project

quantum SPATIAL



Andrew Brenner, Chad Lopez, Mark Yoders, John Cothrun, Brian Condon

FLORIDA FOREST SERVICE Agriculture & Consumer Services

F4 TECH

Bio Resource

Overview

- Introductions
- Objective of 2015 update
- Summary of results
- Key observations
- Possible future directions

Project Objectives 2015 Update

- Comprehensive stratified inventory to identify available timber resources over Florida
- FIA used as inventory data source
- Update forest land cover map that has forest cover type, stand age class and origin as stratifiers
- Update the ownership of the forest resources
- Update current biomass removals
- Assess balance between timber growth and timber removals

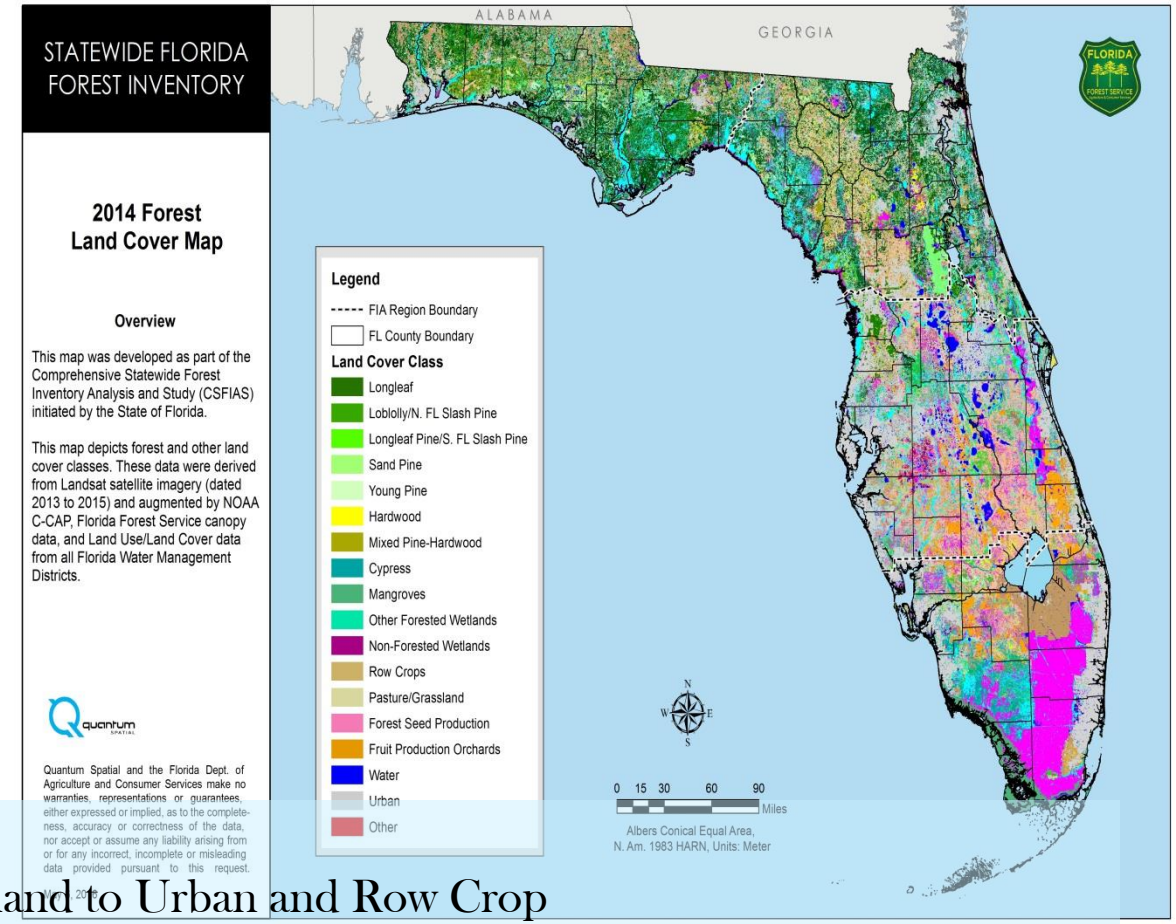
Key Changes in for 2015 Update

- Approach used was the same as 2014 study

No Changes

Forest Cover Type

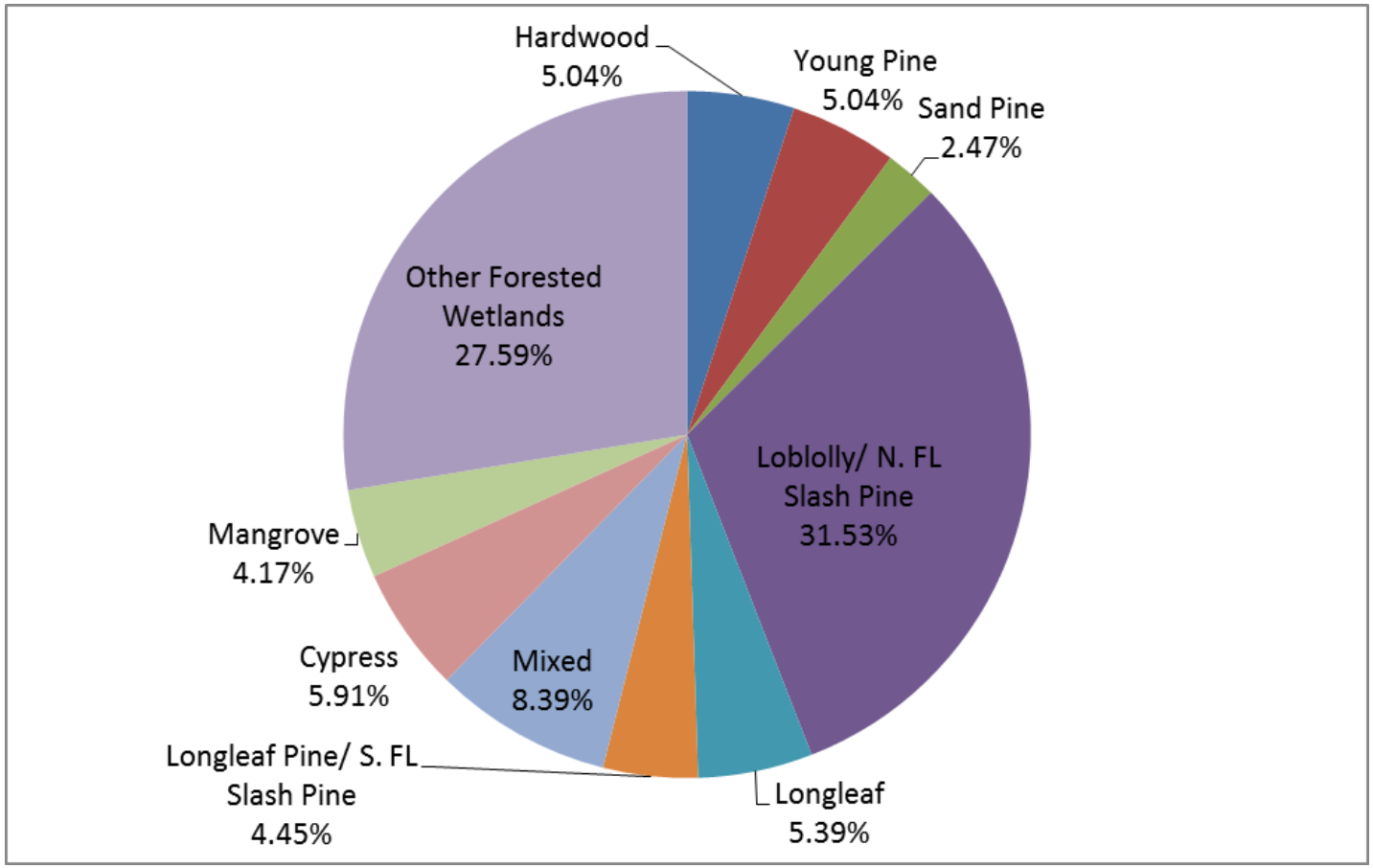
- Forestland cover in Florida totals 16.96 million acres, or 47% of all terrestrial area
  - 49% is pine
  - 45% is hardwood or mixed hardwood-pine
  - 6% is cypress.
- Other land cover
  - agriculture and fruit orchards (20%)
  - non-forested wetlands (12%)
  - urban areas (17%)
  - inland water (4%)



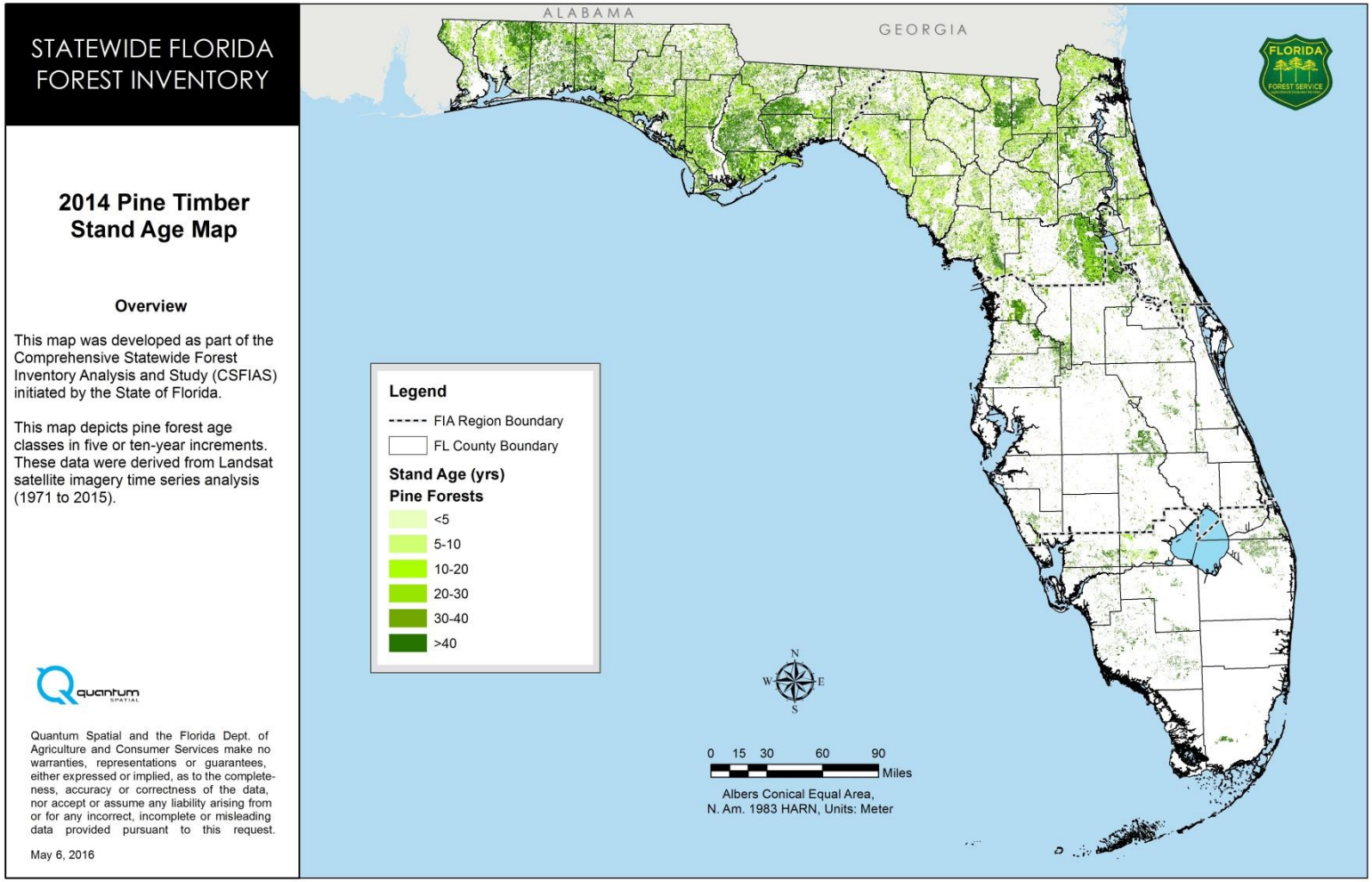
Changes from 2013:

1) Loss of 4,893 acres of forestland to Urban and Row Crop
2) Loss of 400 acres of forested wetland

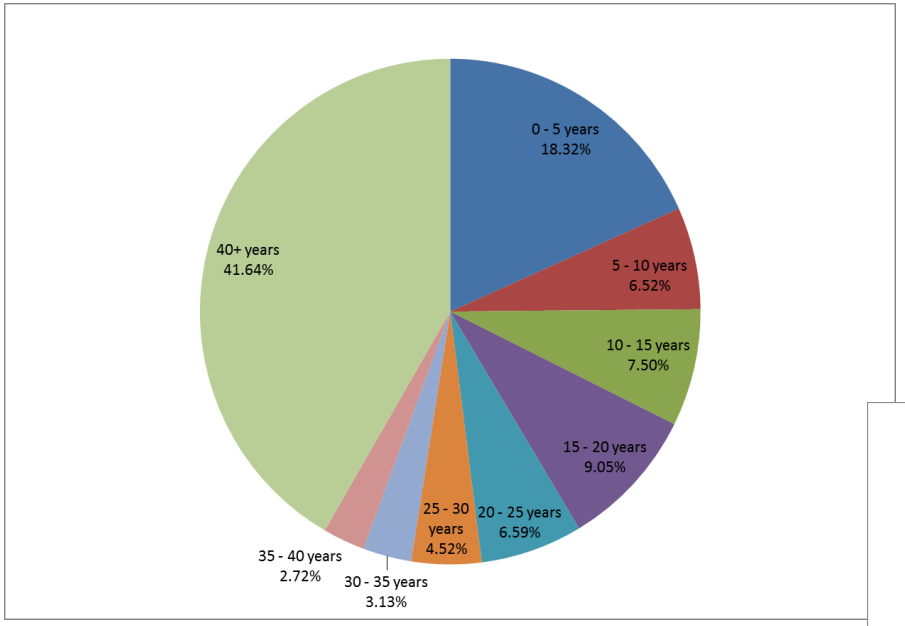
Forest Cover Type



Stand Age

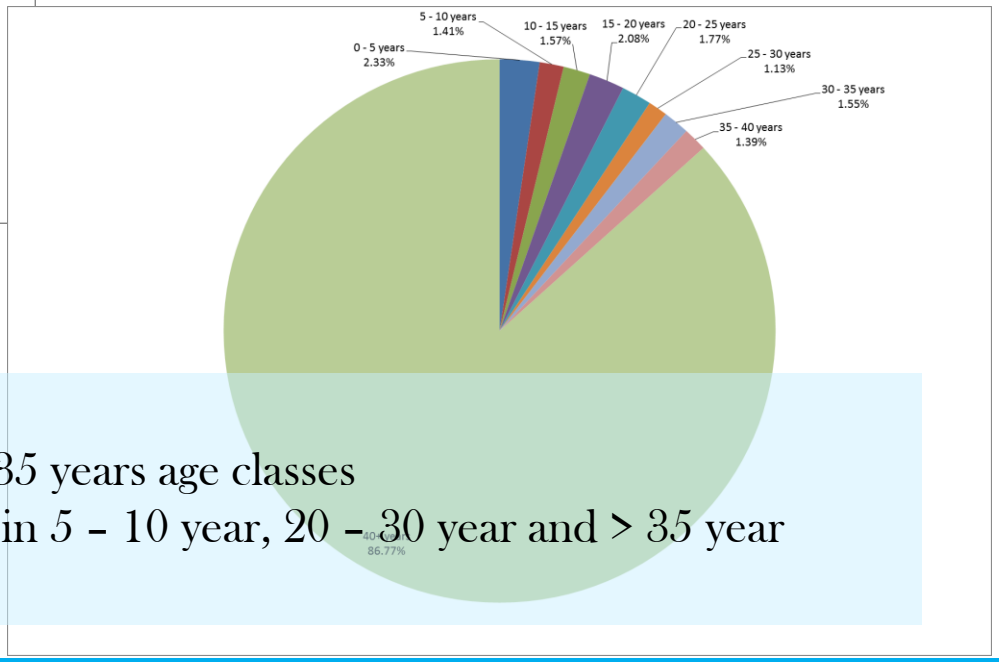

STATEWIDE FLORIDA FOREST INVENTORY
2014 Pine Timber Stand Age Map
Overview
This map was developed as part of the Comprehensive Statewide Forest Inventory Analysis and Study (CSFIAS) initiated by the State of Florida.
This map depicts pine forest age classes in five or ten-year increments. These data were derived from Landsat satellite imagery time series analysis (1971 to 2015).
Quantum Spatial and the Florida Dept. of Agriculture and Consumer Services make no warranties, representations or guarantees, either expressed or implied, as to the completeness, accuracy or correctness of the data, nor accept or assume any liability arising from or for any incorrect, incomplete or misleading data provided pursuant to this request.
May 6, 2016
ALABAMA
GEORGIA
FLORIDA
FOREST SERVICE
Legend
FIA Region Boundary
FL County Boundary
Stand Age (yrs)
Pine Forests
<5
5-10
10-20
20-30
30-40
>40
N
W
E
S
0 15 30 60 90
Miles
Albers Conical Equal Area,
N. Am. 1983 HARN, Units: Meter

Stand Age



Pine

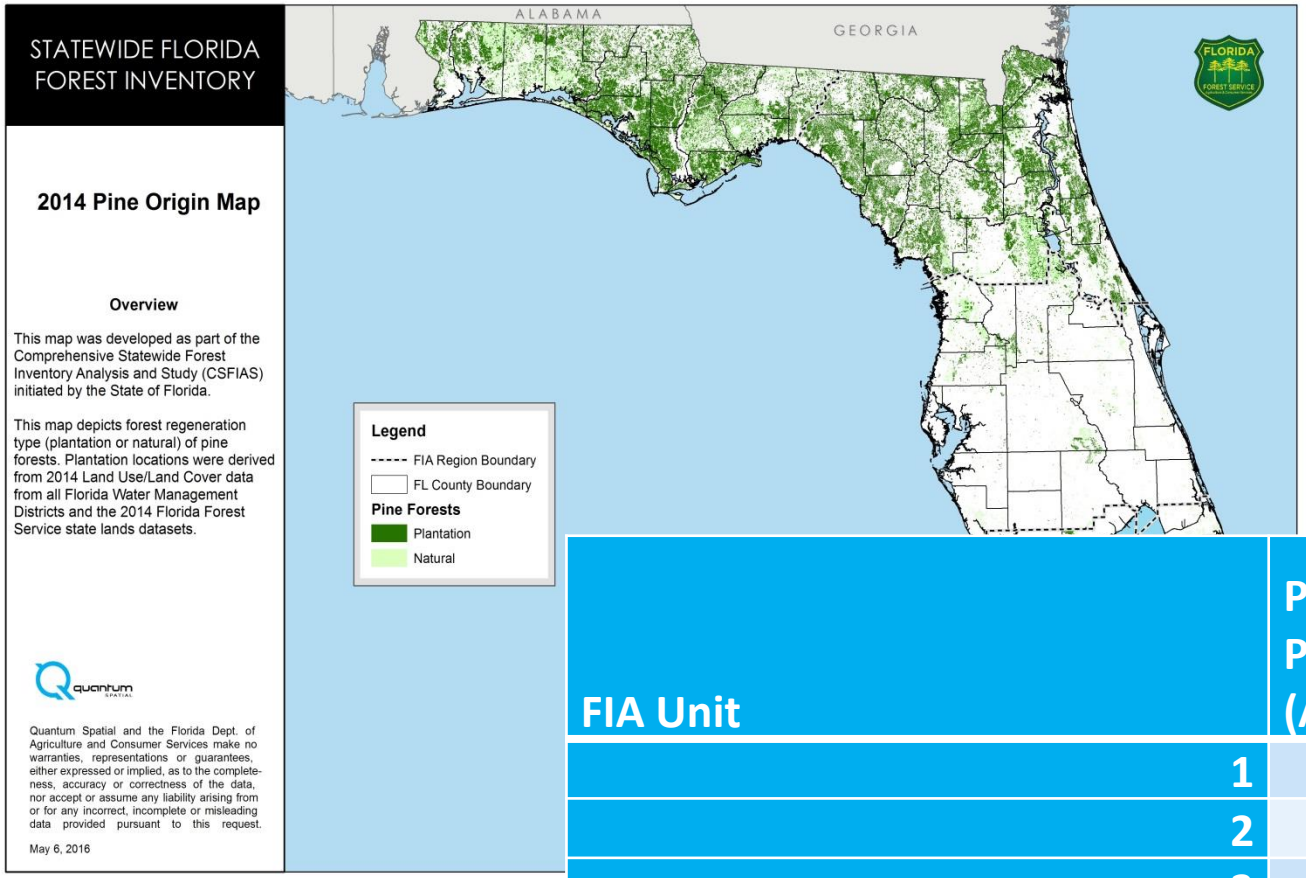
Hardwood & Cypress



Changes from 2013:

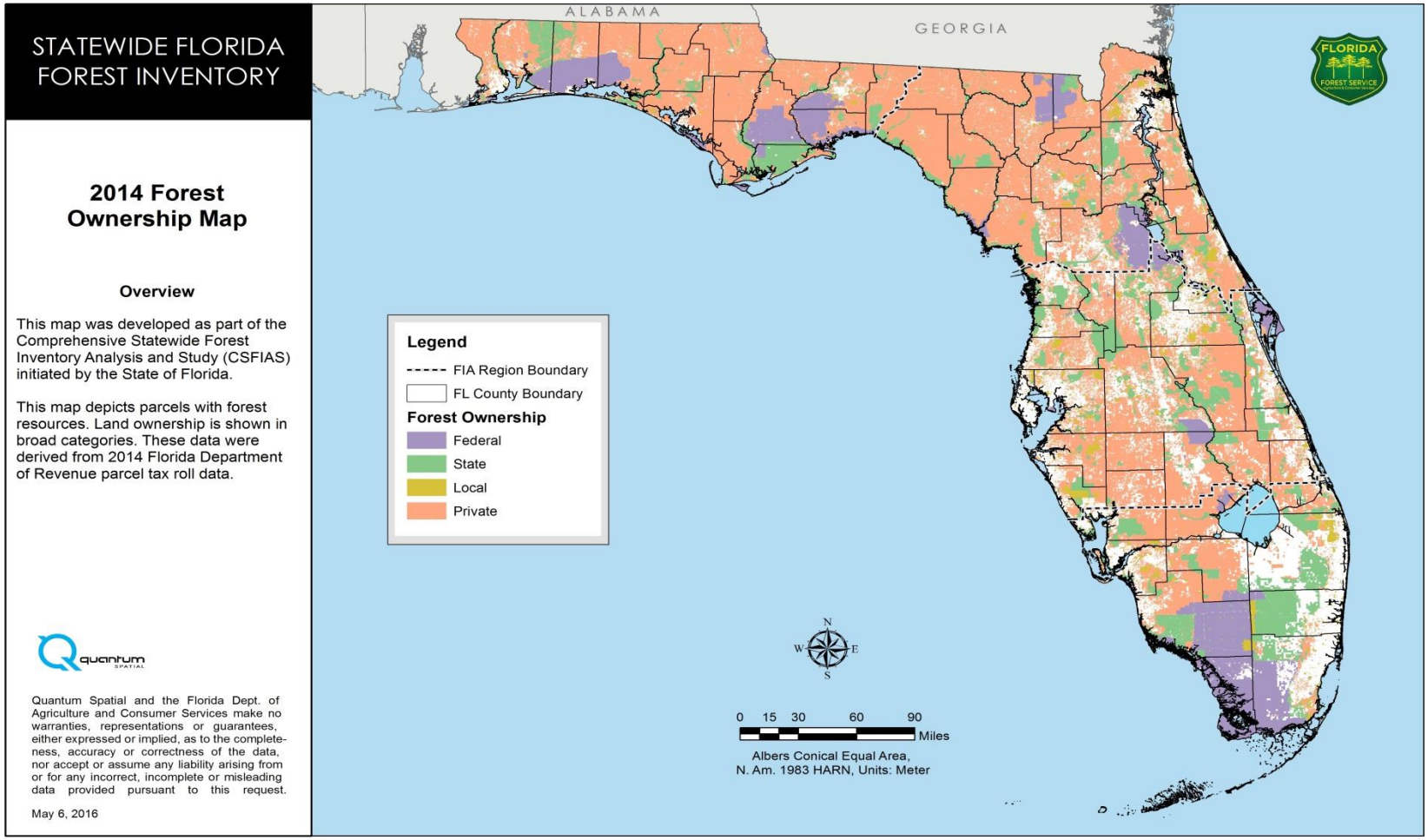
1) For Pine increases in 0 – 5 years, 20 – 35 years age classes
2) For Hardwoods and Cypress increases in 5 – 10 year, 20 – 30 year and > 35 year classes

Origin Layer

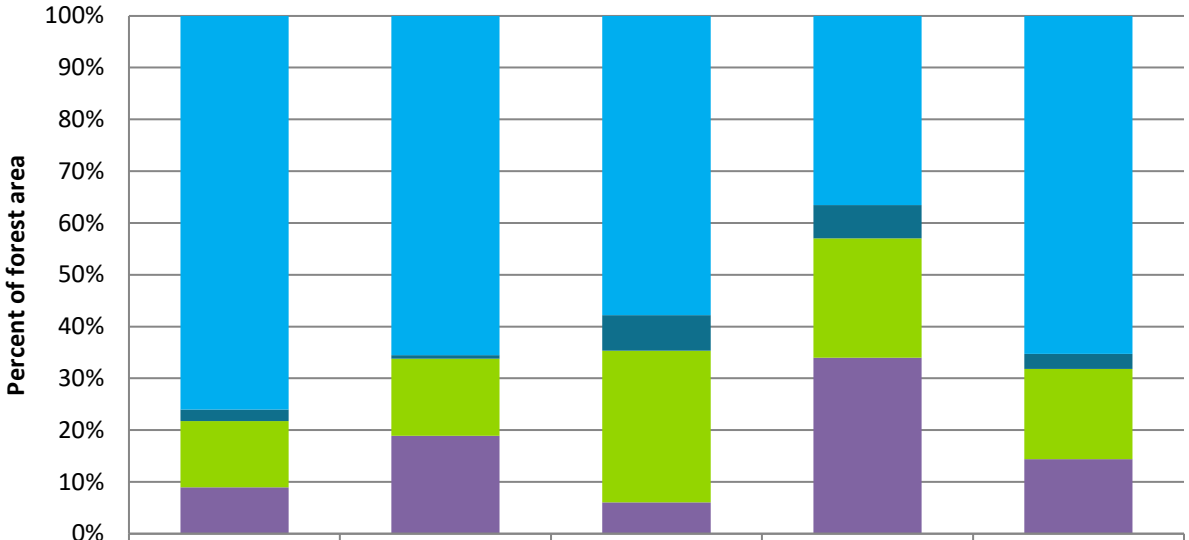


FIA Unit	Pine Plantation (Acres)	% of Total Pine (acres)
1	2,972,816	78.3%
2	2,513,377	70.2%
3	177,697	28.3%
4	60,844	21.3%
Total	5,724,734	69.1%

Forest Ownership



Forest Ownership Breakdown

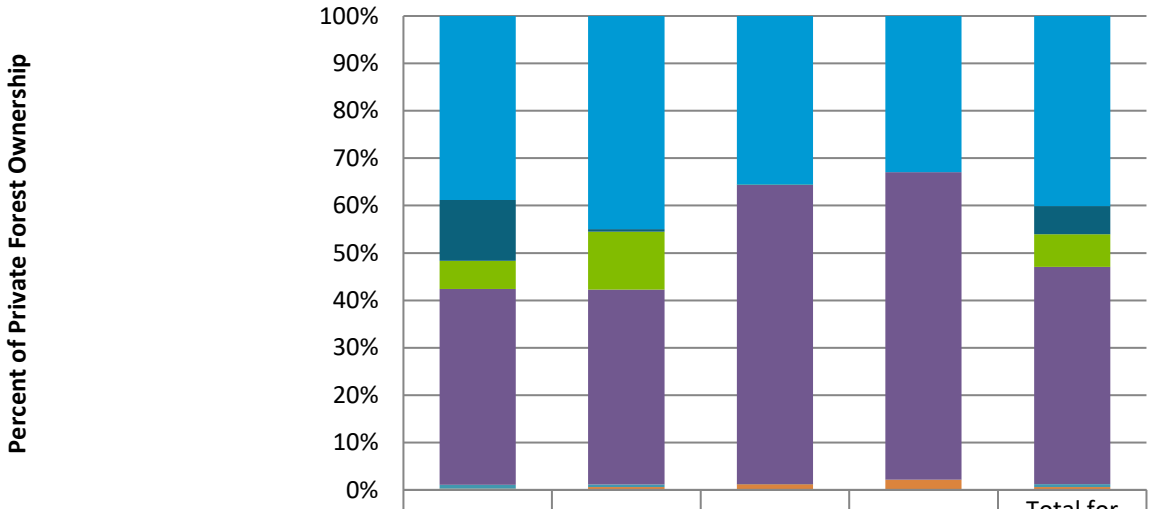


	FIA 1	FIA 2	FIA 3	FIA 4	Total for State
Private	4,727,601	3,585,297	1,577,124	606,227	10,496,249
Local	139,532	36,570	186,824	106,949	469,875
State	796,993	816,147	799,328	382,672	2,795,140
Federal	555,393	1,035,264	165,089	563,770	2,319,516
Total	6,219,519	5,473,278	2,728,365	1,659,618	16,080,780

Changes from 2013:

1) Federal ownership increased by 3,102 acres
2) Private ownership increased by 49,802 acres
3) State ownership decreased by 35,259 acres

Private Ownership



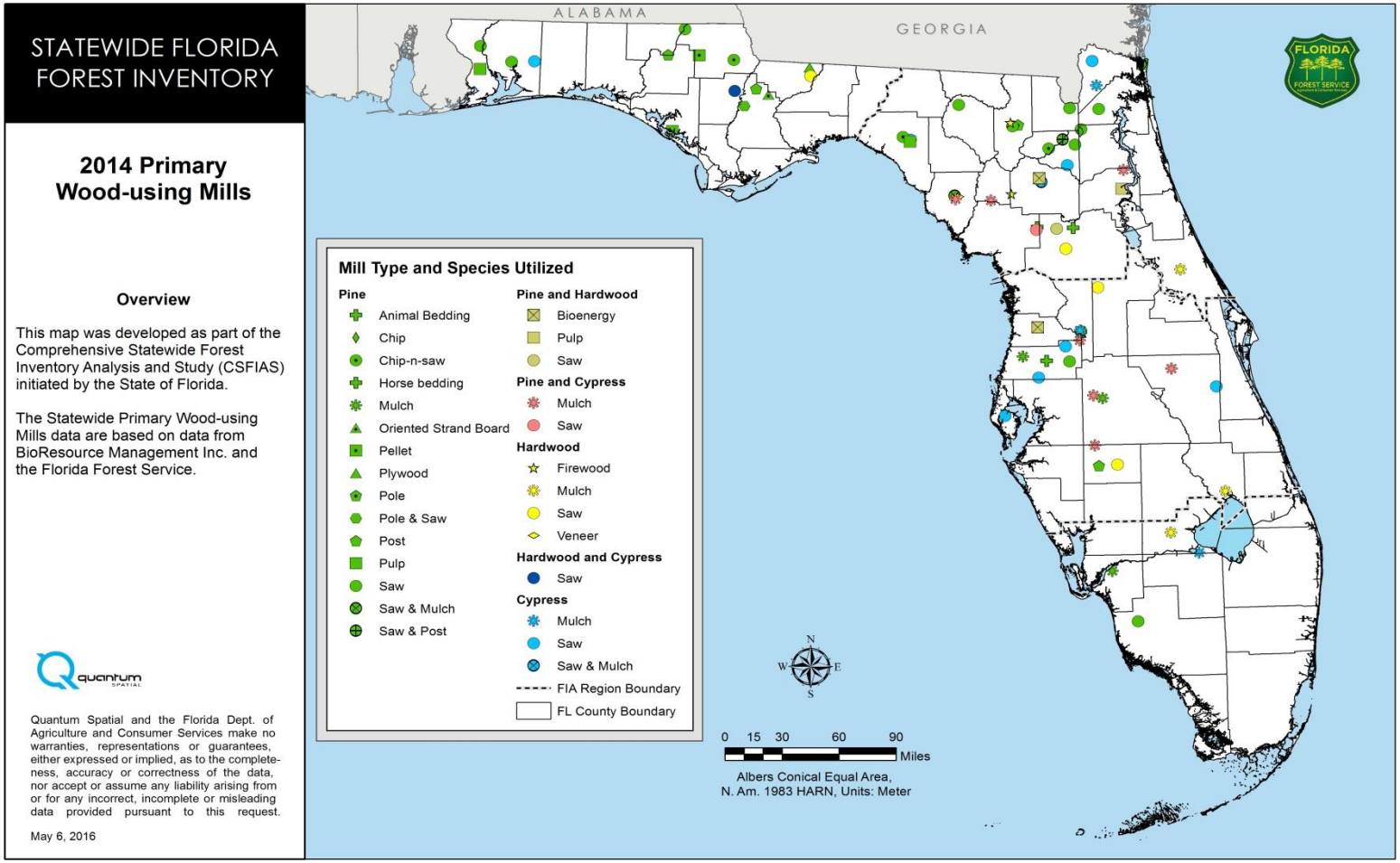
	FIA Unit 1	FIA Unit 2	FIA Unit 3	FIA Unit 4	Total for State
Private nonindustrial, non-corporate (individual and family)	1,834,992	1,612,932	561,014	199,779	4,208,717
Private nonindustrial, corporate REIT	605,685	18,774	0	0	624,459
Private nonindustrial, corporate TIMO	283,617	436,994	13	0	720,624
Private nonindustrial, corporate other	1,952,335	1,475,718	997,702	393,583	4,819,338
Private, forest products industry	39,939	20,878	3	0	60,820
Private, conservation land	3,603	18,740	18,391	12,865	53,599
Private, other	7,430	1,261	1	0	8,692
Total for State	4,727,601	3,585,297	1,577,124	606,227	10,496,249

Primary Mills

- 77 mills included up from 65 mills statewide
- Types range from pulp to mulch and bedding, included bioenergy
- 1 idle

Mill type	Number of mills
Animal Bedding	1
Bioenergy	2
Chip	2
Chip-n-saw	4
Firewood	2
Horse bedding	2
Mulch	19
Oriented Strand Board	1
Pallets	1
Pellet	1
Plywood	1
Pole	2
Pole and Saw	1
Post	3
Pulp	6
Saw	25
Saw & Mulch	2
Saw & Post	1
Veneer	1
Grand Total	77

Mill Locations



Standing Timber

	% of Standing Pine Timber within FIA unit		% of Standing Hardwood and Cypress Timber within FIA unit	
FIA Unit	Pulpwood	Chip-n-Saw & Sawtimber	Pulpwood	Sawtimber
1	39.9%	60.1%	35.3%	64.7%
2	35.0%	65.0%	36.3%	65.0%
3	25.6%	74.4%	35.0%	65.0%
4	27.0%	73.0%	42.8%	57.2%
	Standing Timber (green tons)			
State of Florida	148,469,359	264,989,204	221,843,427	377,162,924
	35.91%	64.09%	37.0%	63.0%

Changes from 2013:

1) Pine Pulpwood decrease by 2.8 million tons
2) Pine sawtimber increase by 9.0 million tons
3) Hardwood and Cypress increase by 8.2 million tons

Standing Timber

STATEWIDE FLORIDA FOREST INVENTORY

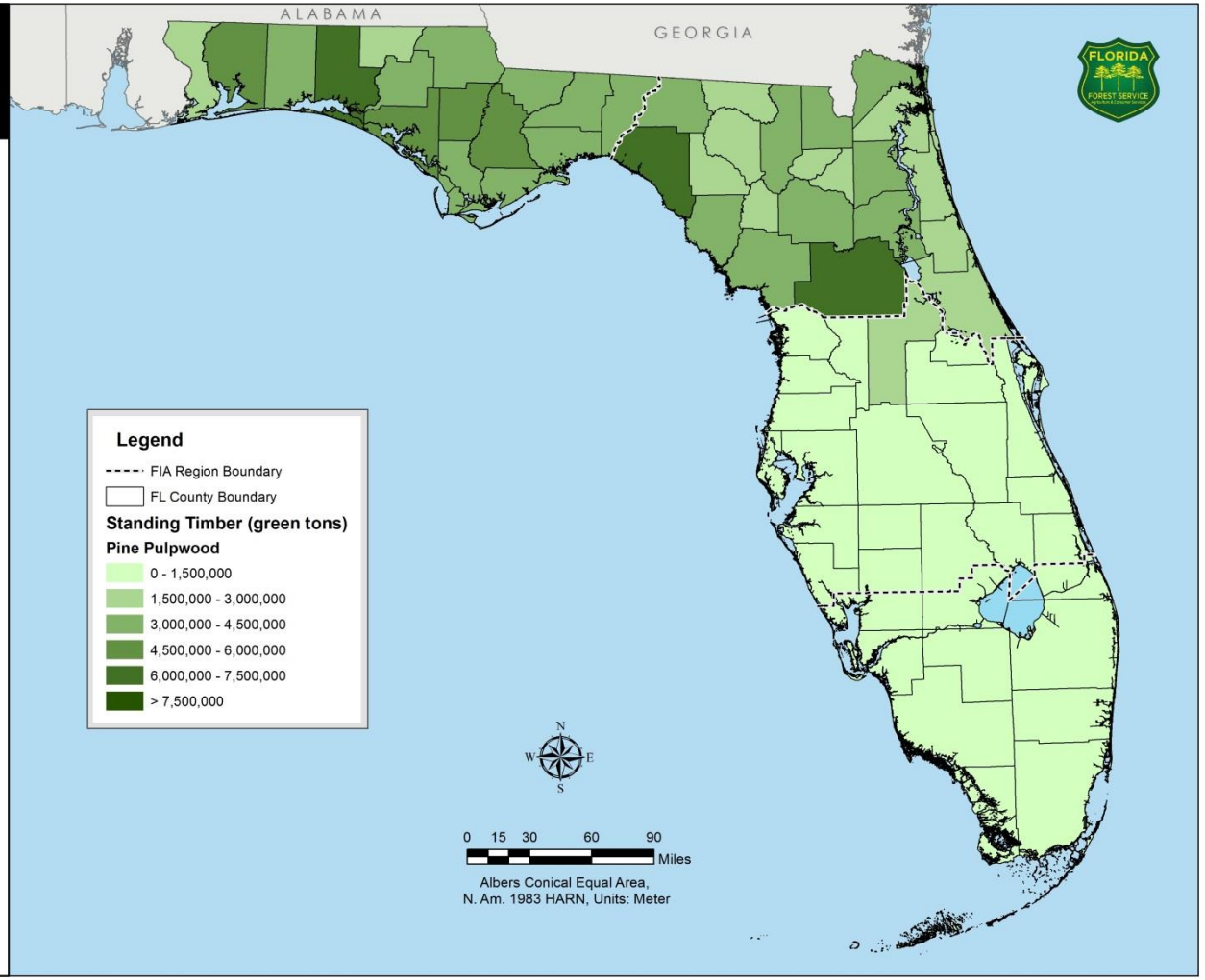
2014 Standing Timber Map

Pine Pulpwood

Overview

This map was developed as part of the Comprehensive Statewide Forest Inventory Analysis and Study (CSFIAS) initiated by the State of Florida.

This map depicts distribution of pine pulpwood (5.0" to 8.9" DBH) standing timber in green tons for each Florida County. These data are based on the 2013-2015 Forest Land Cover, 1971-2015 Stand Age analysis, and 2014 FIA data.



Quantum Spatial and the Florida Dept. of Agriculture and Consumer Services make no warranties, representations or guarantees, either expressed or implied, as to the completeness, accuracy or correctness of the data, nor accept or assume any liability arising from or for any incorrect, incomplete or misleading data provided pursuant to this request.

May 6, 2016

Impact of Reserved Timber

Variable	Pine Pulpwood (1000 Green Tons)	Pine Sawtimber (1000 Green Tons)	Pine Total (1000 Green Tons)	Hardwood & Cypress Pulpwood (1000 Green Tons)	Hardwood & Cypress Sawtimber (1000 Green Tons)	Hardwood & Cypress Total (1000 Green Tons)
2014 Florida Total NRT Green Tons of Stock Biomass	145,200	256,843	402,043	188,442	339,935	528,378
2014 Florida Stock Total	148,469	264,989	413,458	221,843	377,162	599,006
Difference of Stock from NRT Stock	-3,268	-8,146	-11,414	-33,400	-37,227	-70,628
Difference of Stock from NRT Stock	-2.3%	-3.2%	-2.8%	-17.7%	-11.0%	-13.4%

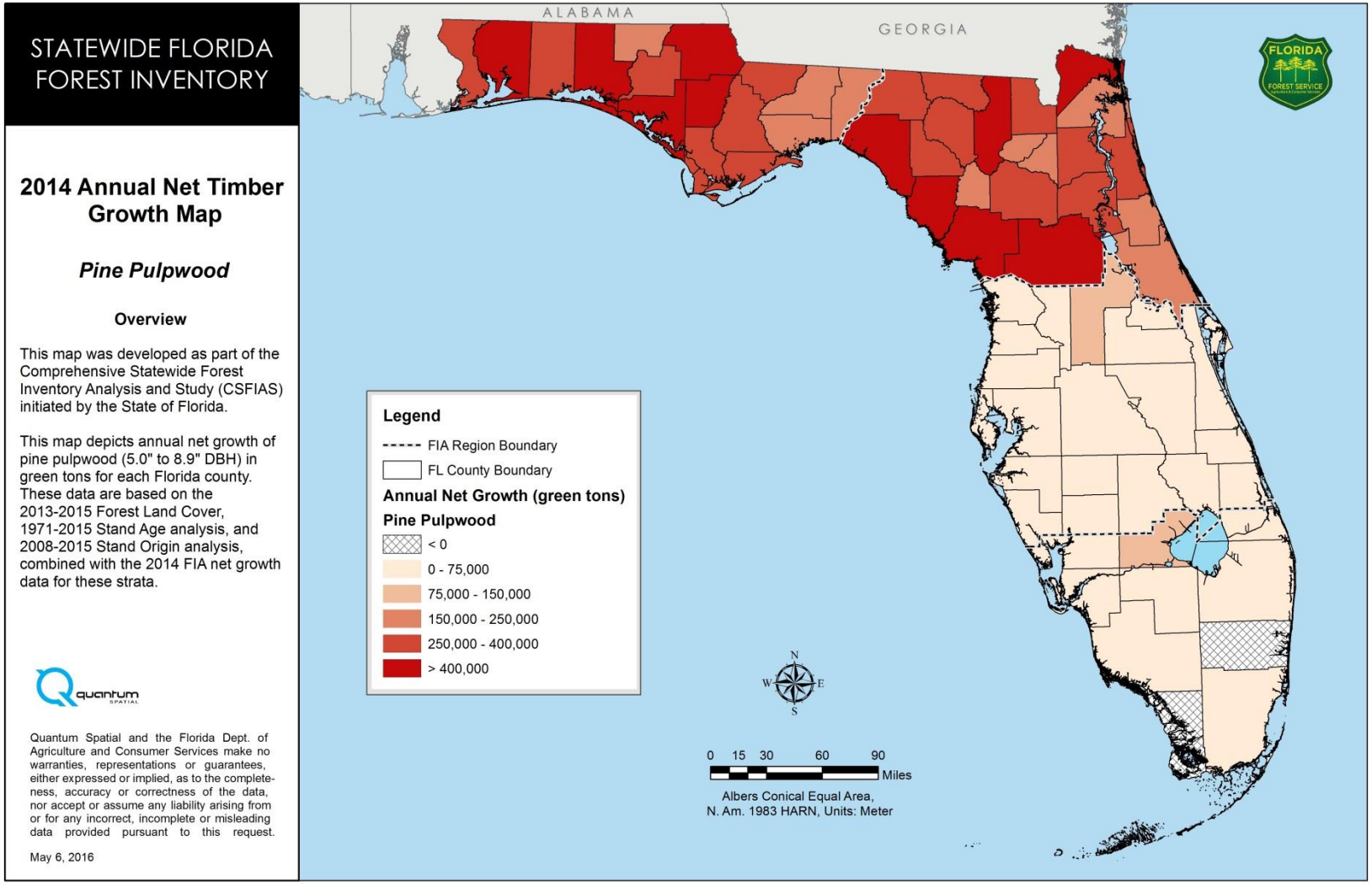
Net Growth

	% of Non-reserved Net Growth Pine Timber within FIA unit		% of Non-reserved Net Growth Hardwood and Cypress Timber within FIA unit	
FIA Unit	Pulpwood	Chip-n-Saw & Sawtimber	Pulpwood	Sawtimber
1	63.2%	36.8%	37.3%	62.7%
2	57.9%	42.1%	36.8%	63.2%
3	39.3%	60.7%	31.7%	68.3%
4	46.3%	53.7%	34.1%	65.9%
	Net Annual Growth (green tons)			
Green Tons	12,548,360	8,611,504	3,610,829	6,547,235
Percent	40.1%	27.5%	11.5%	20.9%

Changes from 2013:

1) Pine pulpwood increase by 1.1 million tons
2) Pine sawtimber increase by 0.07 million tons
3) Hardwood and Cypress increase by 0.6 million tons

Net Growth


STATEWIDE FLORIDA FOREST INVENTORY
2014 Annual Net Timber Growth Map
Pine Pulpwood
Overview
This map was developed as part of the Comprehensive Statewide Forest Inventory Analysis and Study (CSFIAS) initiated by the State of Florida.
This map depicts annual net growth of pine pulpwood (5.0" to 8.9" DBH) in green tons for each Florida county. These data are based on the 2013-2015 Forest Land Cover, 1971-2015 Stand Age analysis, and 2008-2015 Stand Origin analysis, combined with the 2014 FIA net growth data for these strata.
Quantum Spatial and the Florida Dept. of Agriculture and Consumer Services make no warranties, representations or guarantees, either expressed or implied, as to the completeness, accuracy or correctness of the data, nor accept or assume any liability arising from or for any incorrect, incomplete or misleading data provided pursuant to this request.
May 6, 2016
ALABAMA
GEORGIA
FLORIDA
FOREST SERVICE
Legend
FIA Region Boundary
FL County Boundary
Annual Net Growth (green tons)
Pine Pulpwood
< 0
0 - 75,000
75,000 - 150,000
150,000 - 250,000
250,000 - 400,000
> 400,000
N
W
E
S
0 15 30 60 90
Miles
Albers Conical Equal Area,
N. Am. 1983 HARN, Units: Meter

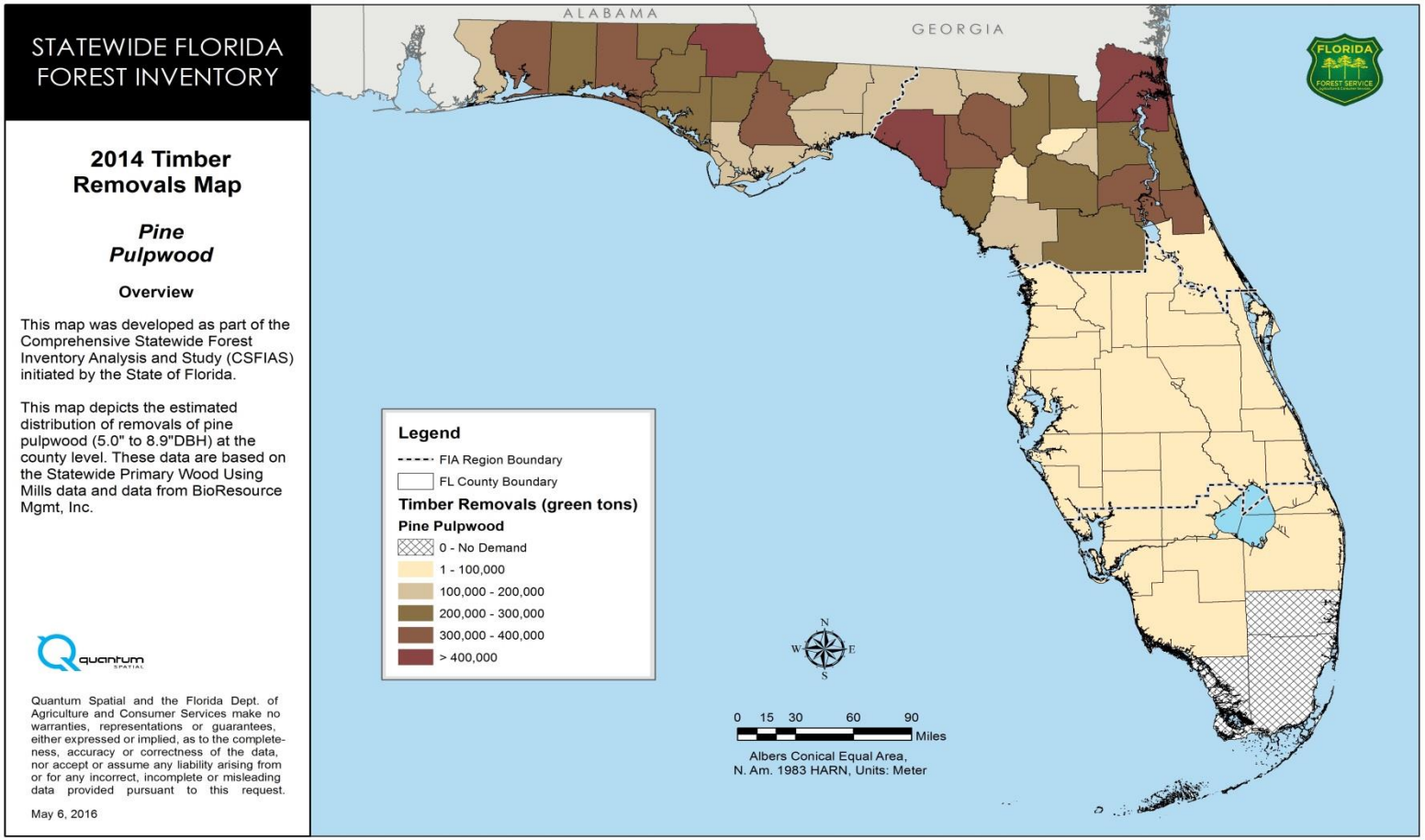
Timber Removals

	% of Pine Removals within FIA unit		% of Hardwood and Cypress Removals within FIA unit	
FIA Unit	Pulpwood	Chip-n-Saw & Sawtimber	Pulpwood	Sawtimber
1	67.7%	32.3%	86.7%	13.3%
2	64.5%	35.5%	82.6%	17.4%
3	81.0%	19.0%	72.2%	27.8%
4	94.7%	5.3%	98.8%	1.2%
	Annual Removals (green tons)			
Green Tons	9,871,902	4,891,170	1,323,109	248,093
Percent	60.4%	29.9%	8.1%	1.5%

Changes from 2013:

1) Pine pulpwood decrease by 0.09 million tons
2) Pine sawtimber increase by 0.23 million tons
3) Hardwood and Cypress increase by 0.27 million tons

Pulpwood Removals



Sustainability Index

	Pine Sustainability		Hardwood and Cypress Sustainability	
FIA Unit	Pulpwood	Chip-n-Saw & Sawtimber	Pulpwood	Sawtimber
1	1.13	1.38	1.81	19.84
2	1.45	1.91	3.46	28.24
3	1.66	10.98	4.54	25.45
4	1.83	37.62	5.23	832.10
	Sustainability			
Florida	1.27	1.76	2.73	26.39

Changes from 2013:

1) Pine pulpwood increase by 0.09
2) Pine sawtimber decrease by 0.08
3) Hardwood and Cypress pulpwood decrease by 0.62
4) Hardwood and Cypress sawtimber increase by 0.08

Pine Pulpwood Sustainability

STATEWIDE FLORIDA FOREST INVENTORY

2014 Forest Sustainability Map

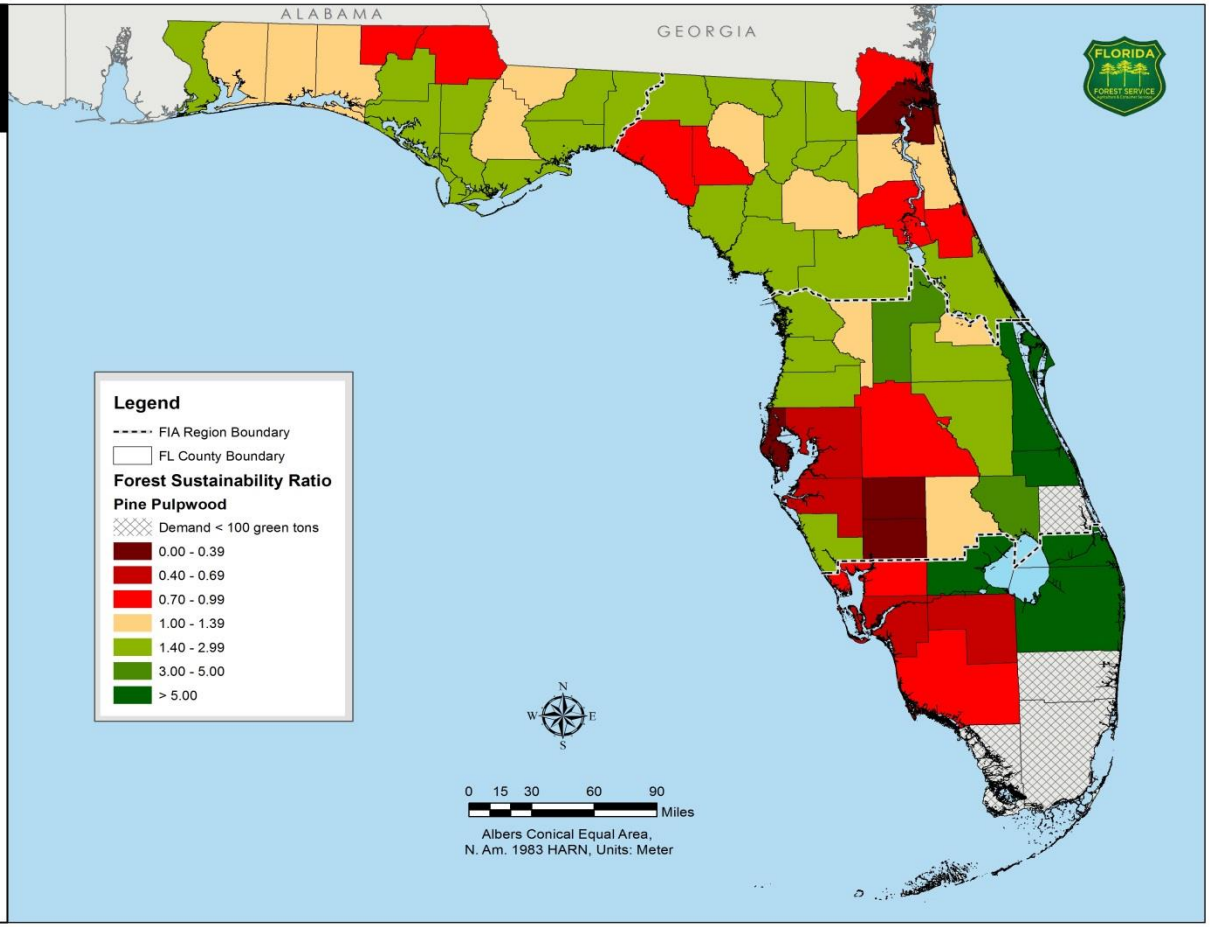
Pine Pulpwood

Overview

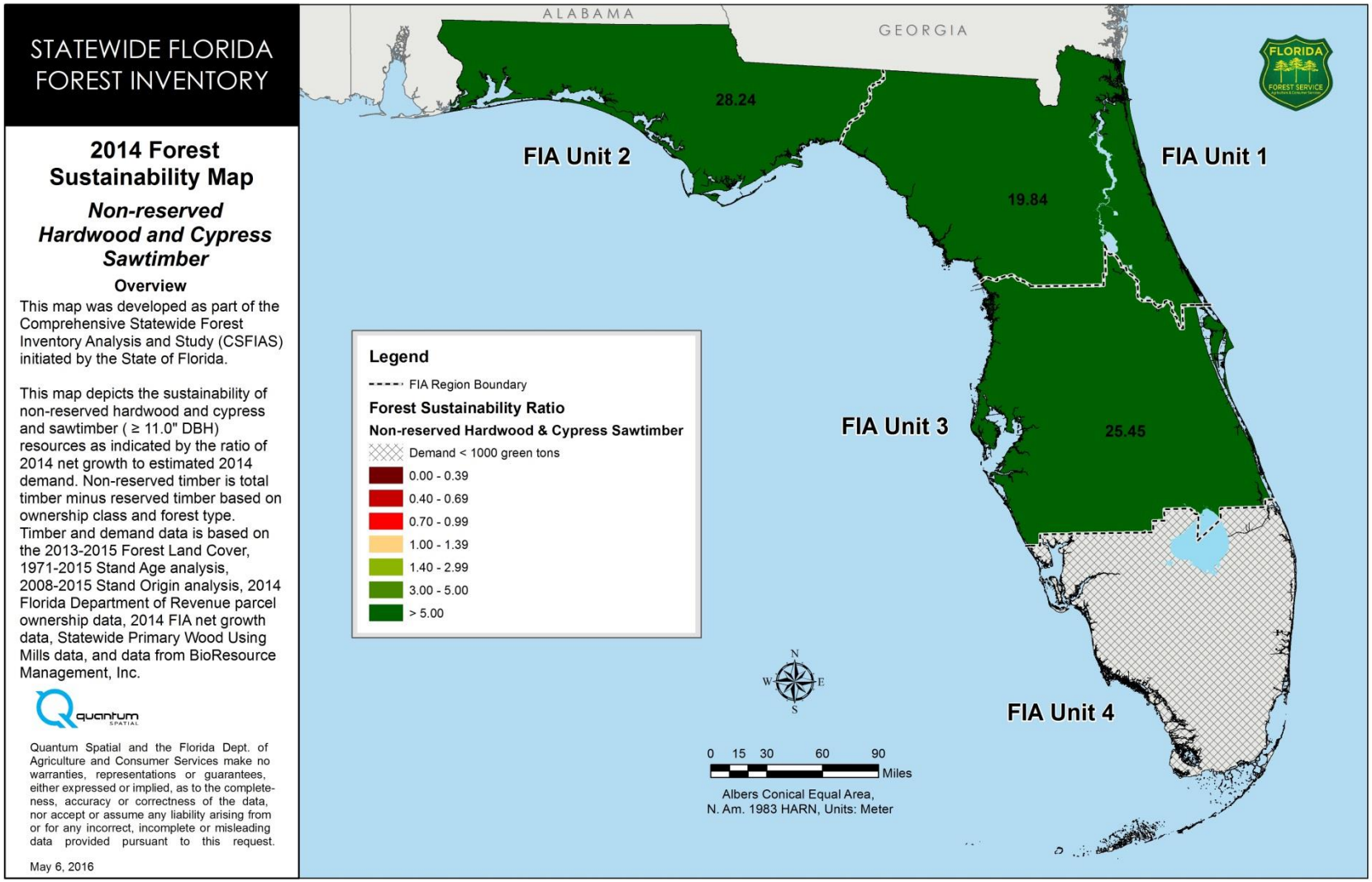
This map was developed as part of the Comprehensive Statewide Forest Inventory Analysis and Study (CSFIAS) initiated by the State of Florida.

This map depicts the sustainability of pine pulpwood (5.0" to 8.9" DBH) resources as indicated by the ratio of 2014 net growth to estimated 2014 demand. These data are based on 2013-2015 Forest Land Cover, 1971-2015 Stand Age analysis, 2008-2015 Stand Origin analysis, 2014 Florida Department of Revenue parcel ownership data, 2014 FIA net growth data, Statewide Primary Wood Using Mills data, and data from BioResource Management, Inc.

May 6, 2016



Sustainability Index



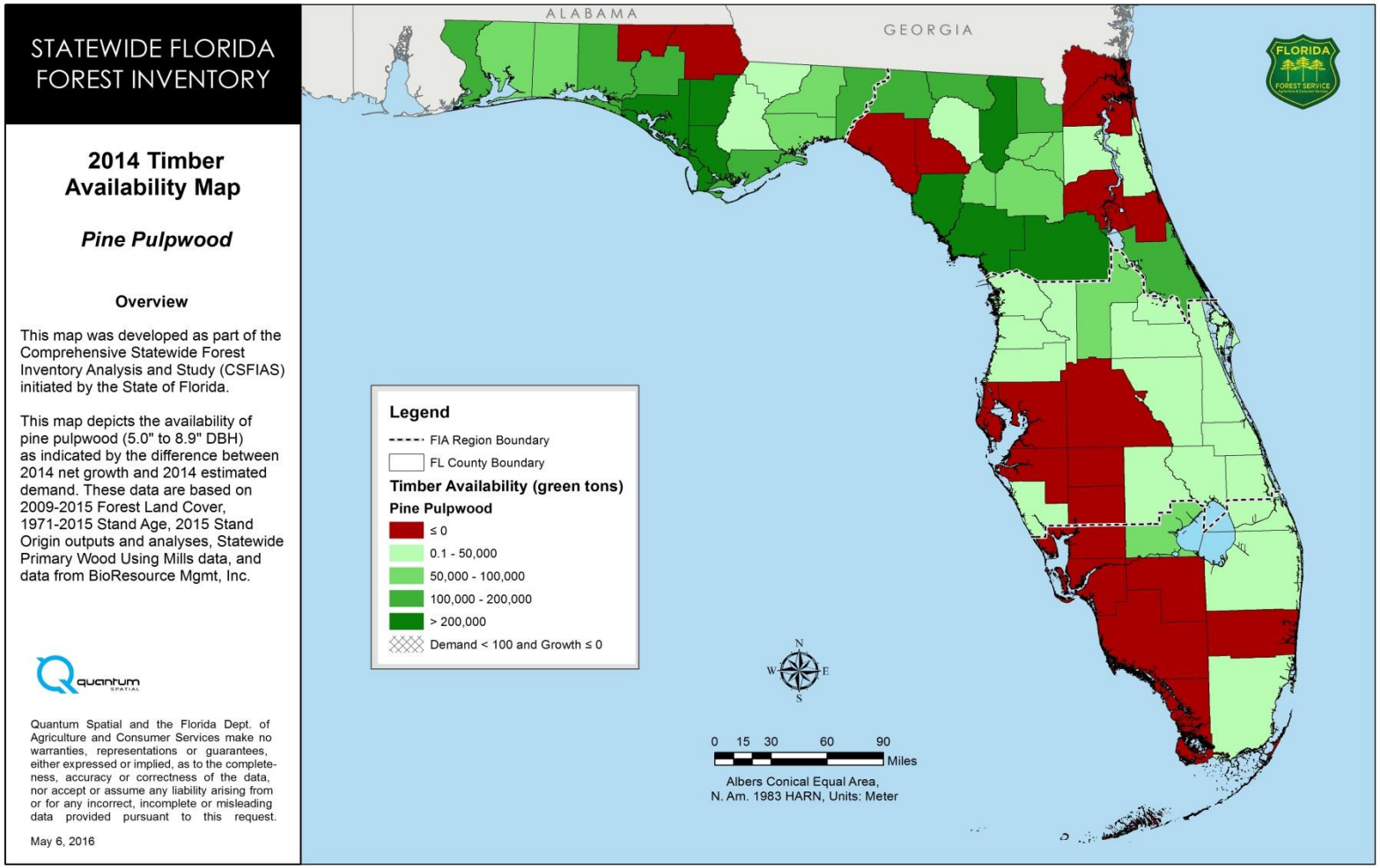
Timber Availability

	Green Tons			
	Pine Availability		Hardwood and Cypress Availability	
FIA Unit	Pulpwood	Chip-n-Saw & Sawtimber	Pulpwood	Sawtimber
1	736,564	1,028,398	619,722	2,214,934
2	1,694,159	1,899,984	806,306	1,880,300
3	174,026	613,523	558,579	1,481,619
4	71,708	178,428	303,113	722,289
	Availability			
Florida	2,676,457	3,720,334	2,287,720	6,299,142

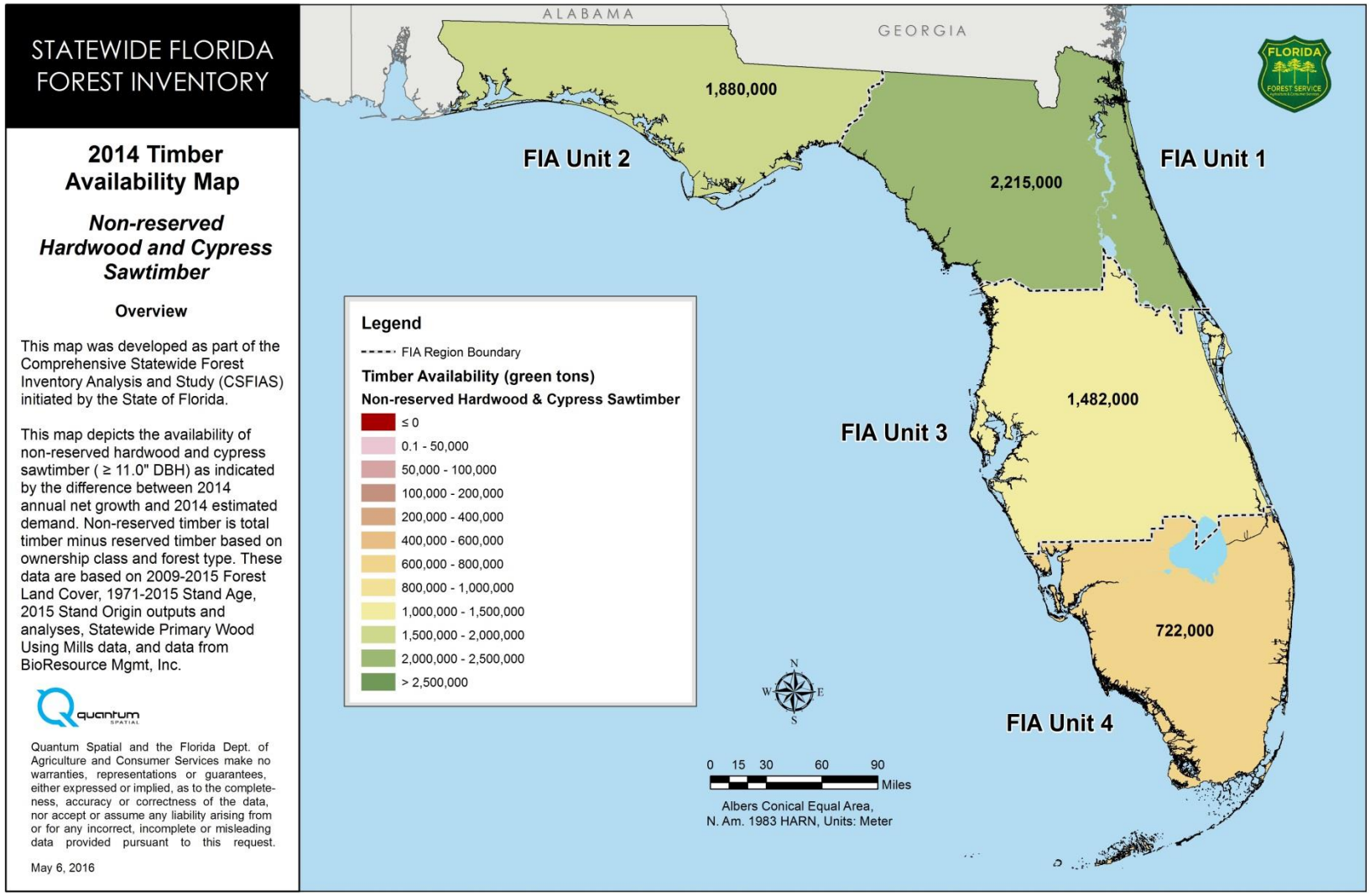
Changes from 2013:

1) Pine pulpwood increase by 0.83 million green tons
2) Pine sawtimber decrease by 0.18 million green tons
3) Hardwood and Cypress pulpwood decrease by 0.22 million green tons
4) Hardwood and Cypress sawtimber increase by 0.52 million green tons

Pine Pulpwood Availability



Availability of all Four Product Types



Pine Pulpwood Resource

- Productivity and removals remain high
- Sustainability Index close to or below 1 for many counties Northeast Florida
- Localized depletions are taking place throughout Northern Florida probably increasing travel distances from field to mill
- Sustainability is > 1 at FIA unit level for all units
- Northeast Florida under greatest pressure, followed by Northwest Florida
- Slight change in demand and growth patterns show trend making the resource more sustainable
- Too early to see if a real trend

Pine Chip-and-saw & Sawtimber Resource

- Generally sustainable condition
- Sustainability indices greater than 1.38, availability in N Florida exceeds 4 million tons
- Some localized issues
- Increased utilization of resource and lower growth leading to lower sustainability
- Still considerable resource remaining
- Overall a sustainable resource

Hardwood & Cypress Pulpwood and Sawtimber

- Lower productivity but markets are limited for both pulpwood and sawtimber
- Sustainability and availability are high over all Florida
- Increasing utilization of hardwood resources in Northern Florida decreasing sustainability but still significant resource available
- Possible trend to higher utilization that could reduce pressure on pine pulpwood
- May also have resulted from increasing number of small mills in assessment

Future Analyses

- Project has provided an assessment of the resource and can show geographic and resource trends
- Improved technologies – higher resolution imagery and analysis techniques can improve the inventory data significantly and be able to track on a three year basis detailed changes and identify localized deficits
- Can be carried out in partnership with other organizations
- Will ensure good decisions are made on sustainable use of resource
- Provide essential information for planning

Questions and Discussions