Climate Change Tree Atlas

The Forest Service's online resource to help land managers chose the right tree for the right site under different climate change scenarios

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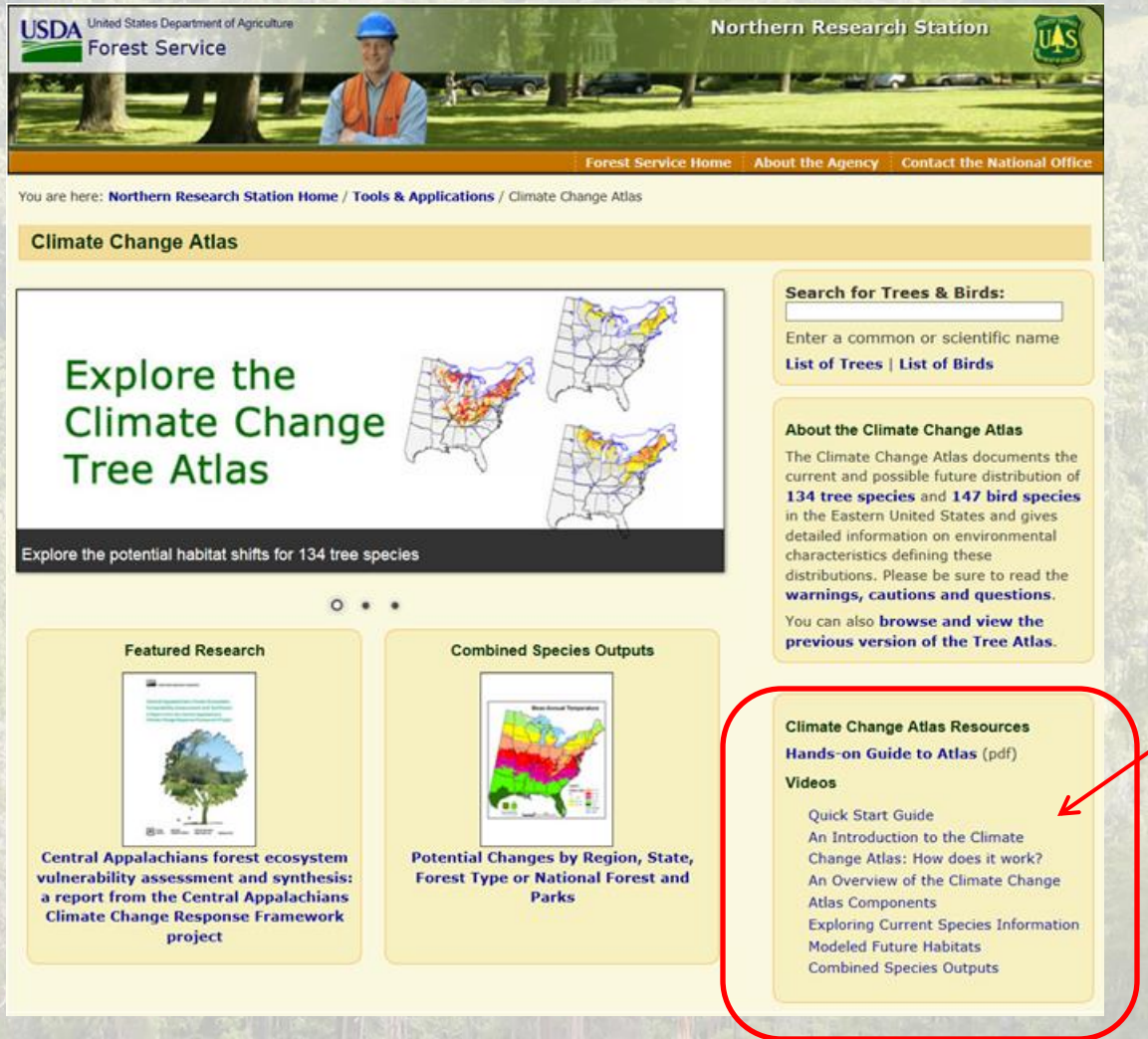
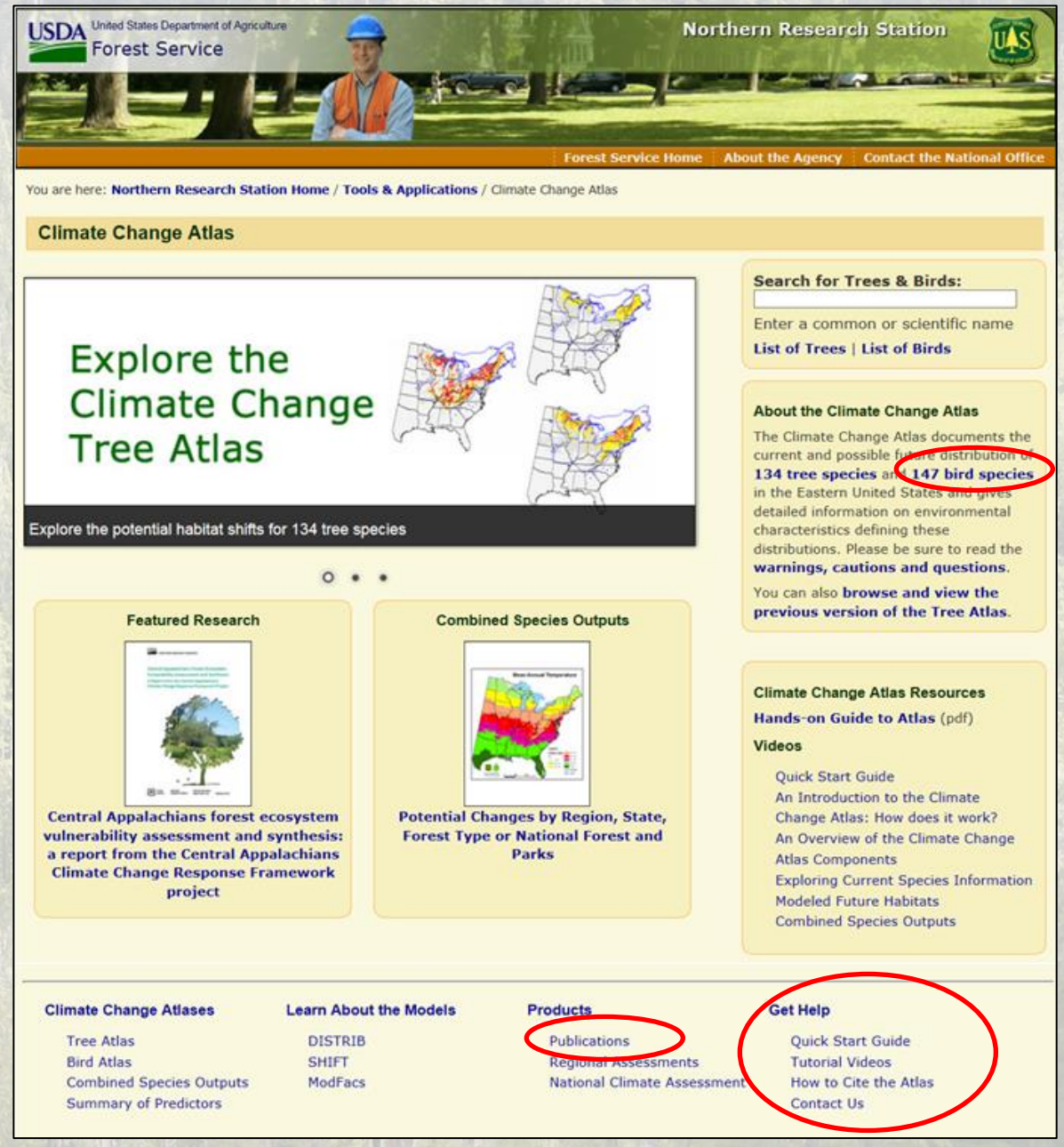
Where to Start?

http://www.fs.fed.us/nrs/atlas/

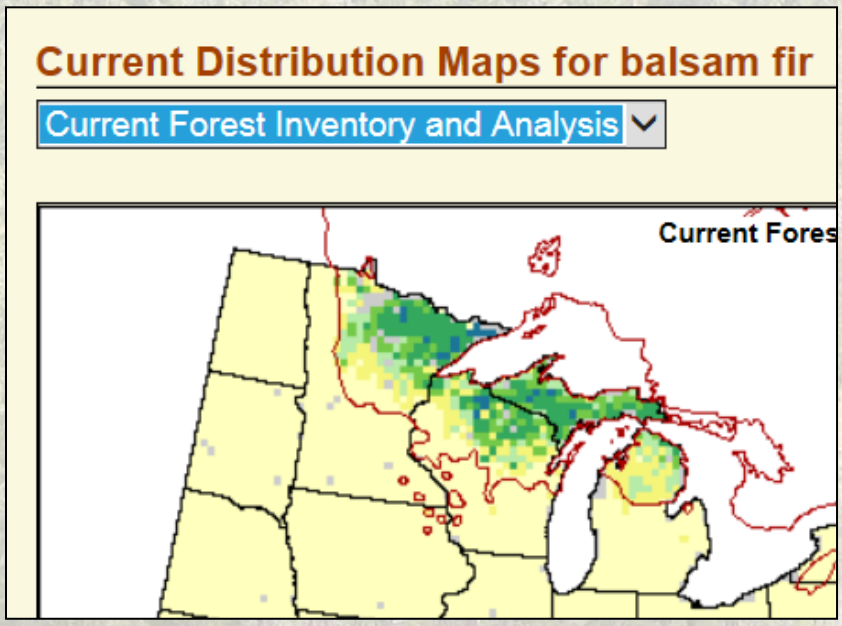


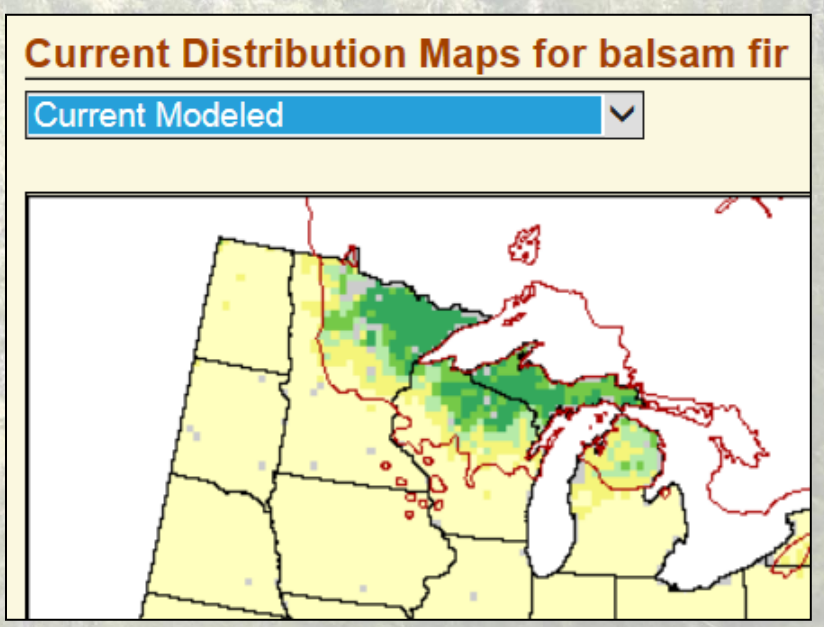
Short instructional videos and guide for the use, background, and functions of the Climate Change Atlas


USDA United States Department of Agriculture
Forest Service
Northern Research Station
Forest Service Home
About the Agency
Contact the National Office
You are here: Northern Research Station Home / Tools & Applications / Climate Change Atlas
Climate Change Atlas
Explore the Climate Change Tree Atlas
Explore the potential habitat shifts for 134 tree species
Search for Trees & Birds:
Enter a common or scientific name
List of Trees | List of Birds
About the Climate Change Atlas
The Climate Change Atlas documents the current and possible future distribution of 134 tree species and 147 bird species in the Eastern United States and gives detailed information on environmental characteristics defining these distributions. Please be sure to read the warnings, cautions and questions.
You can also browse and view the previous version of the Tree Atlas.
Featured Research
Central Appalachians forest ecosystem vulnerability assessment and synthesis: a report from the Central Appalachians Climate Change Response Framework project
Combined Species Outputs
Potential Changes by Region, State, Forest Type or National Forest and Parks
Climate Change Atlas Resources
Hands-on Guide to Atlas (pdf)
Videos
Quick Start Guide
An Introduction to the Climate Change Atlas: How does it work?
An Overview of the Climate Change Atlas Components
Exploring Current Species Information
Modeled Future Habitats
Combined Species Outputs
Climate Change Atlases
Tree Atlas
Bird Atlas
Combined Species Outputs
Summary of Predictors
Learn About the Models
DISTRIB
SHIFT
ModFacs
Products
Publications
Regional Assessments
National Climate Assessment
Get Help
Quick Start Guide
Tutorial Videos
How to Cite the Atlas
Contact Us

Species distribution models developed using

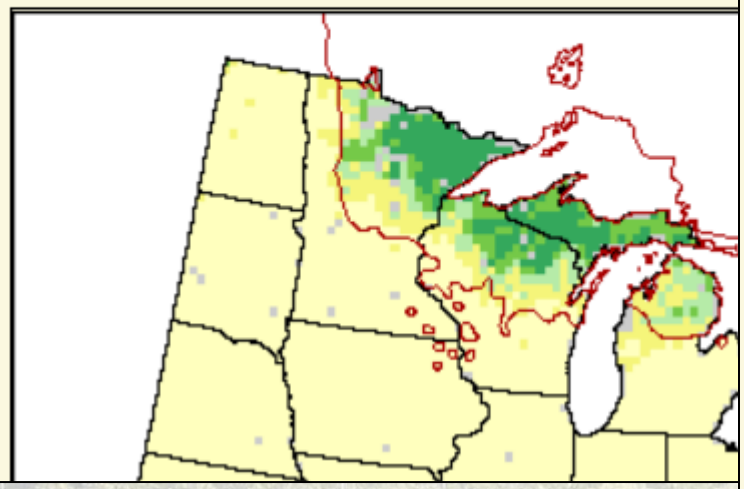
- Soils
- Elevation
- Land Use
- ~~Climate~~ **Future Climate Data**
- Existing Forest Service FIA data





Current Distribution Maps for balsam fir

Current Modeled



balsam fir (*Abies balsamea*)

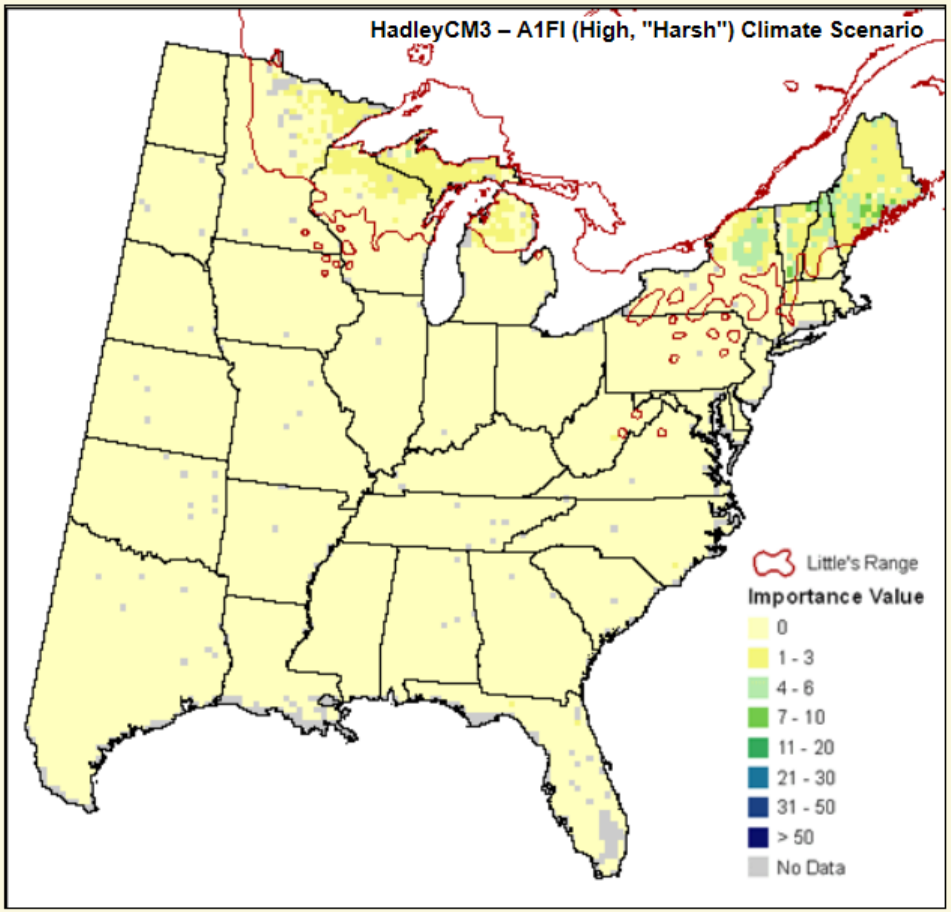
Current Distribution | Projected Future Habitat | Predictor Maps

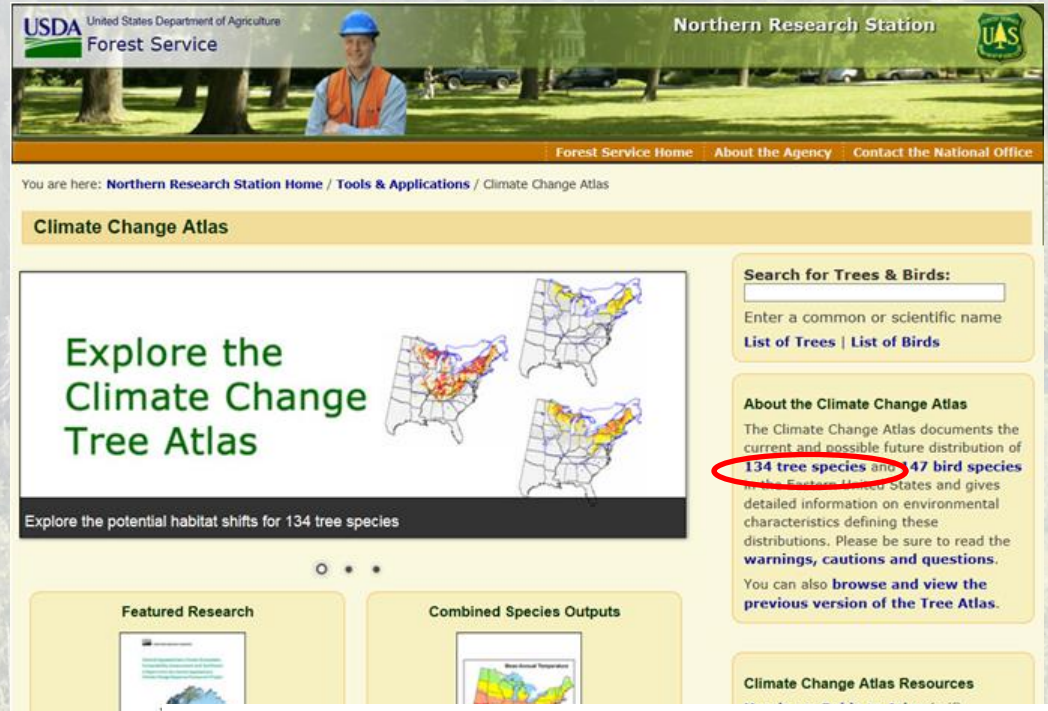
Help »

Climate Change Scenario Maps

HadleyCM3 – A1FI (High, "Harsh")

Compare Scenarios





Tree Species in the Climate Change Tree Atlas

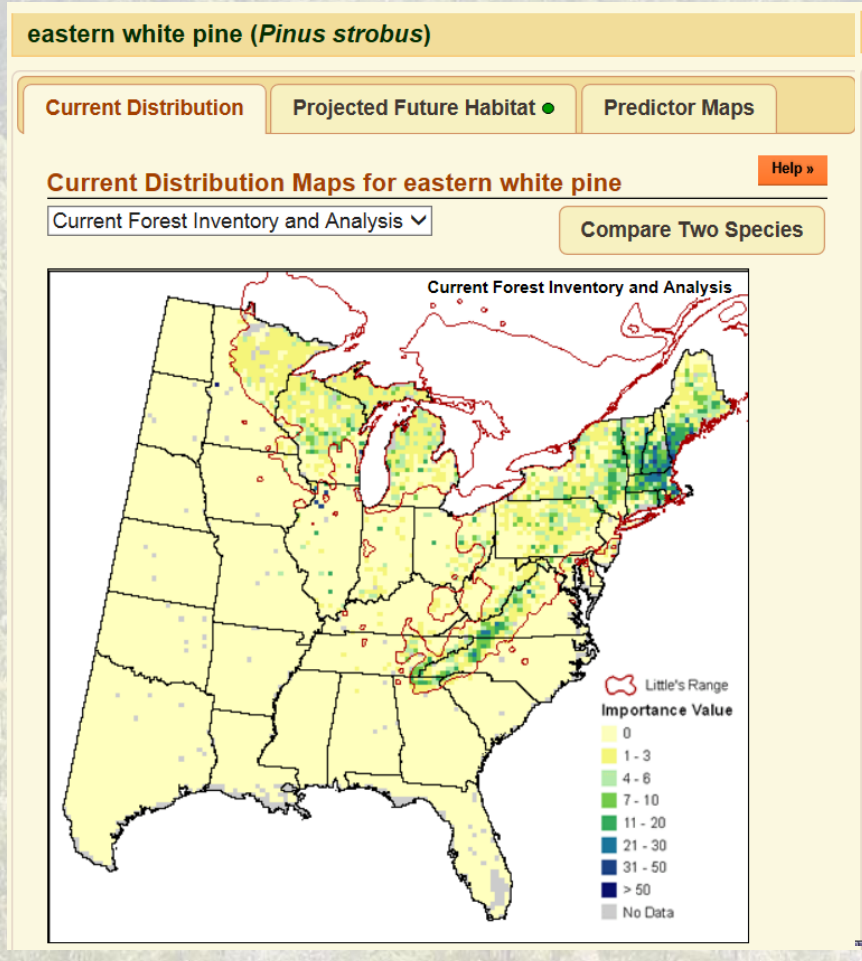
Notice:

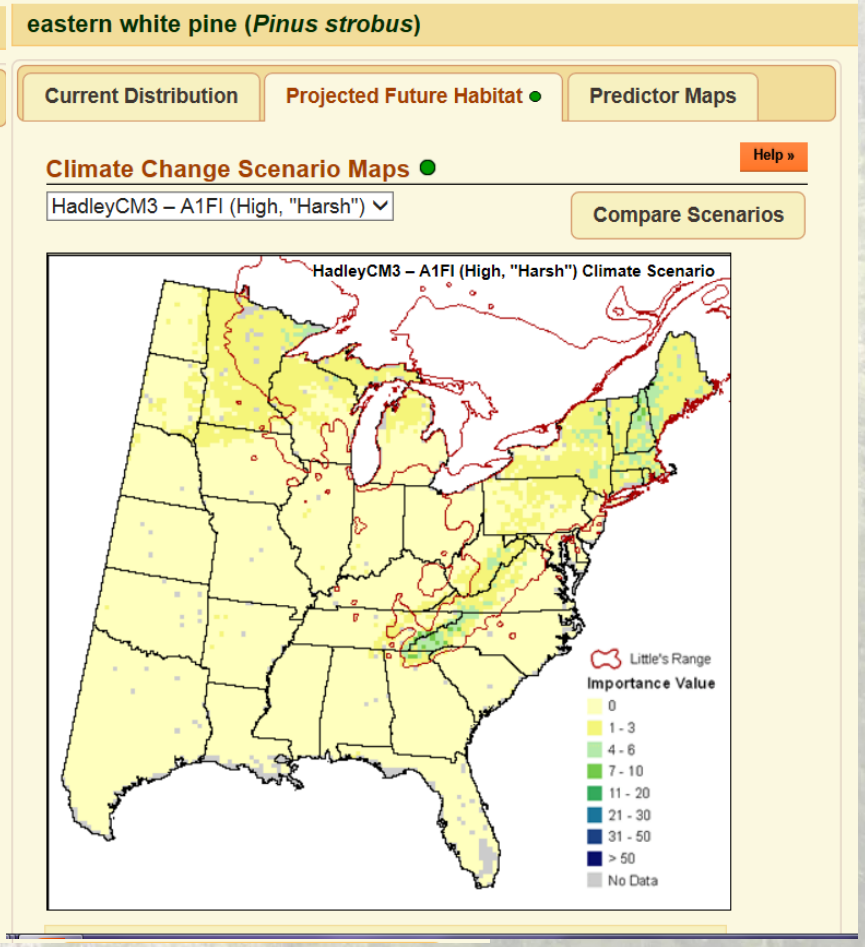
This is an updated version of the Climate Change Tree Atlas. You can also browse the previous Tree Atlas.

Show 25 entries Search:

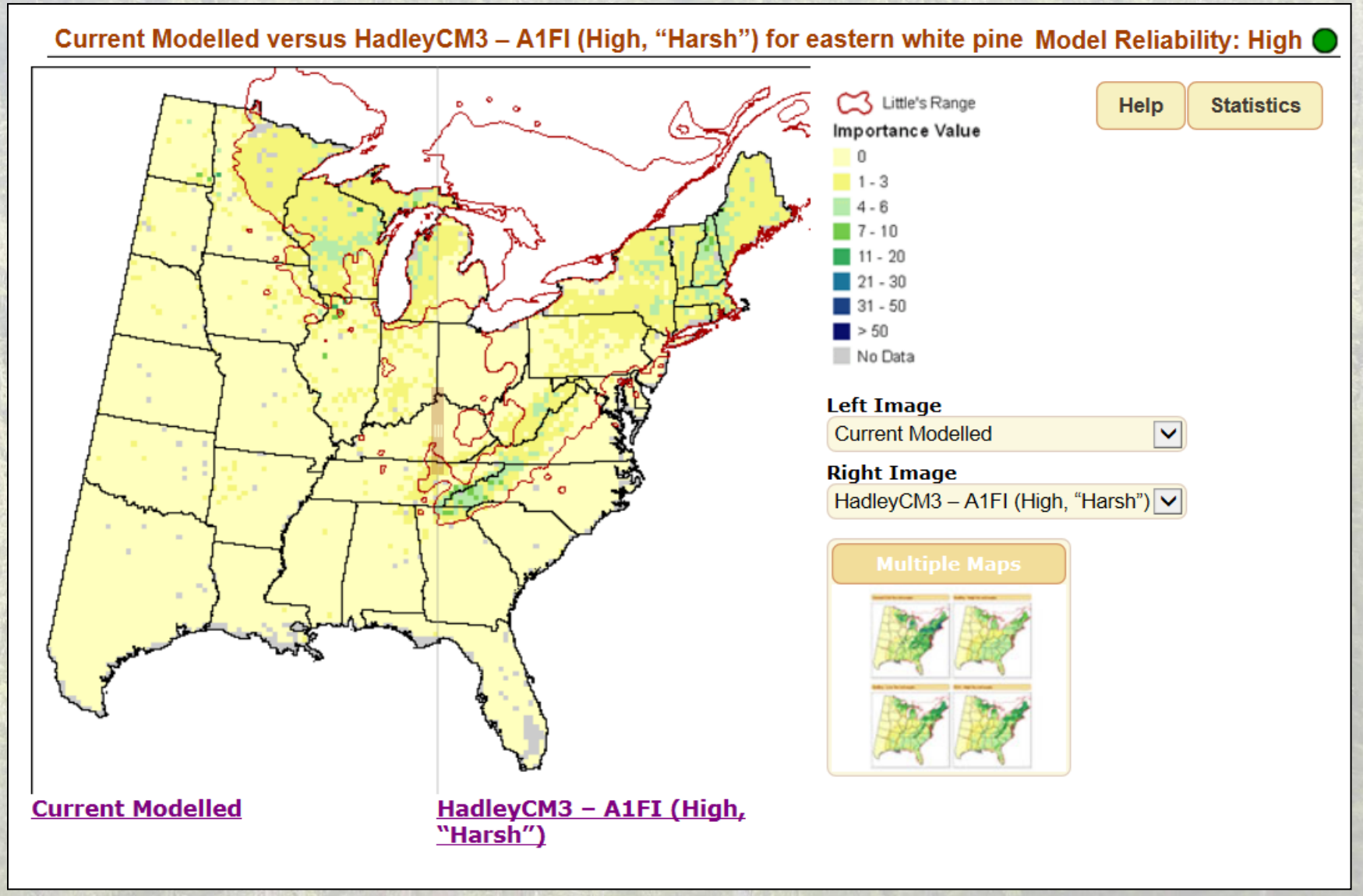
Species Number	Model Reliability	Common Name	Scientific Name
951	2 - Medium	American basswood	Tilia americana
531	3 - High	American beech	Fagus grandifolia
421	2 - Medium	American chestnut	Castanea dentata
972	2 - Medium	American elm	Ulmus americana
591	3 - High	American holly	Ilex opaca
391	2 - Medium	American hornbeam: musclewood	Carpinus caroliniana
935	2 - Medium	American mountain-ash	Sorbus americana
43	1 - Low	Atlantic white-cedar	Chamaecyparis thyoides
221	2 - Medium	bald cypress	Taxodium distichum
12	3 - High	balsam fir	Abies balsamea
741	3 - High	balsam poplar	Populus balsamifera
816	1 - Low	bear oak: scrub oak	Quercus ilicifolia
654	1 - Low	bigleaf magnolia	Magnolia macrophylla
743	3 - High	bigtooth aspen	Populus grandidentata
402	1 - Low	bitternut hickory	Carya cordiformis

Eastern White Pine Distribution and Future Suitable Habitat

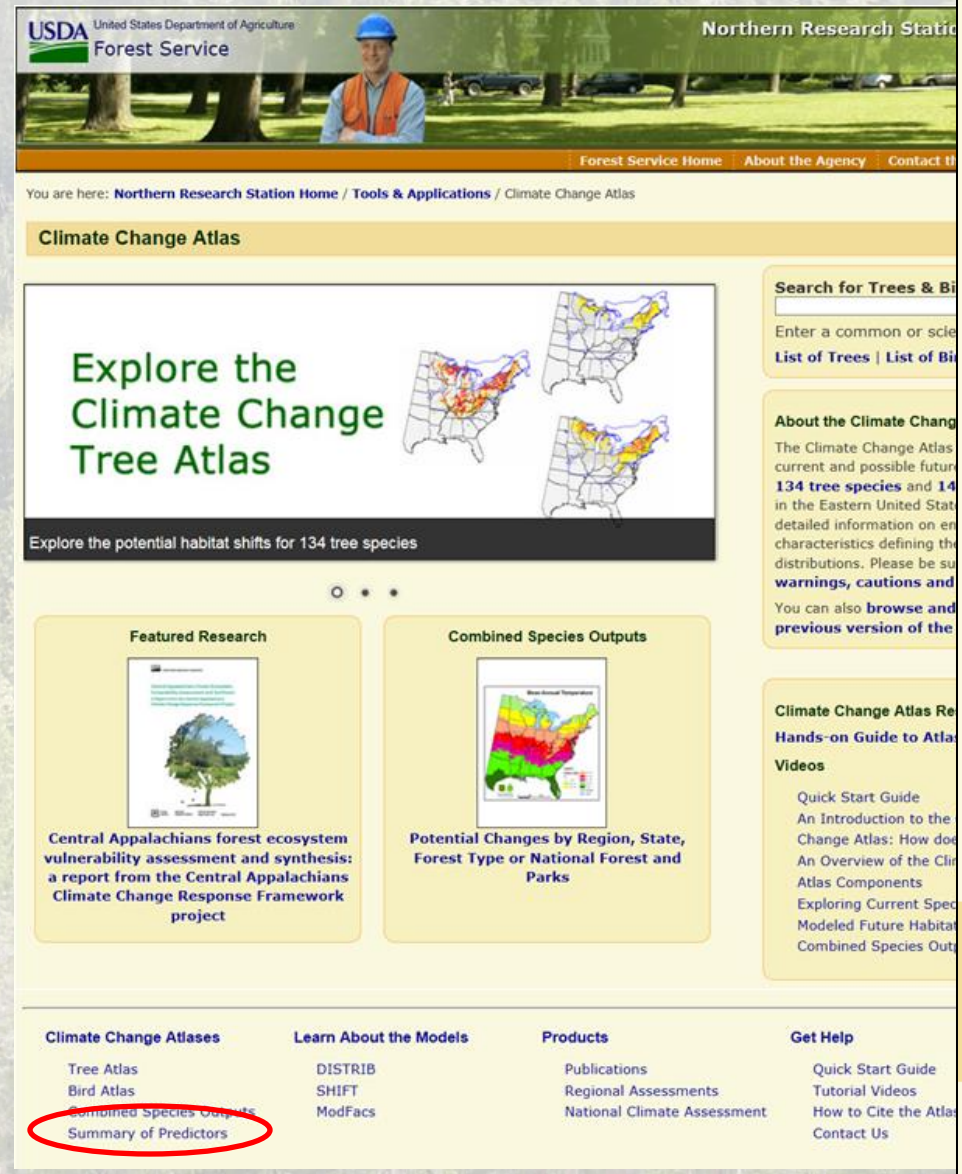


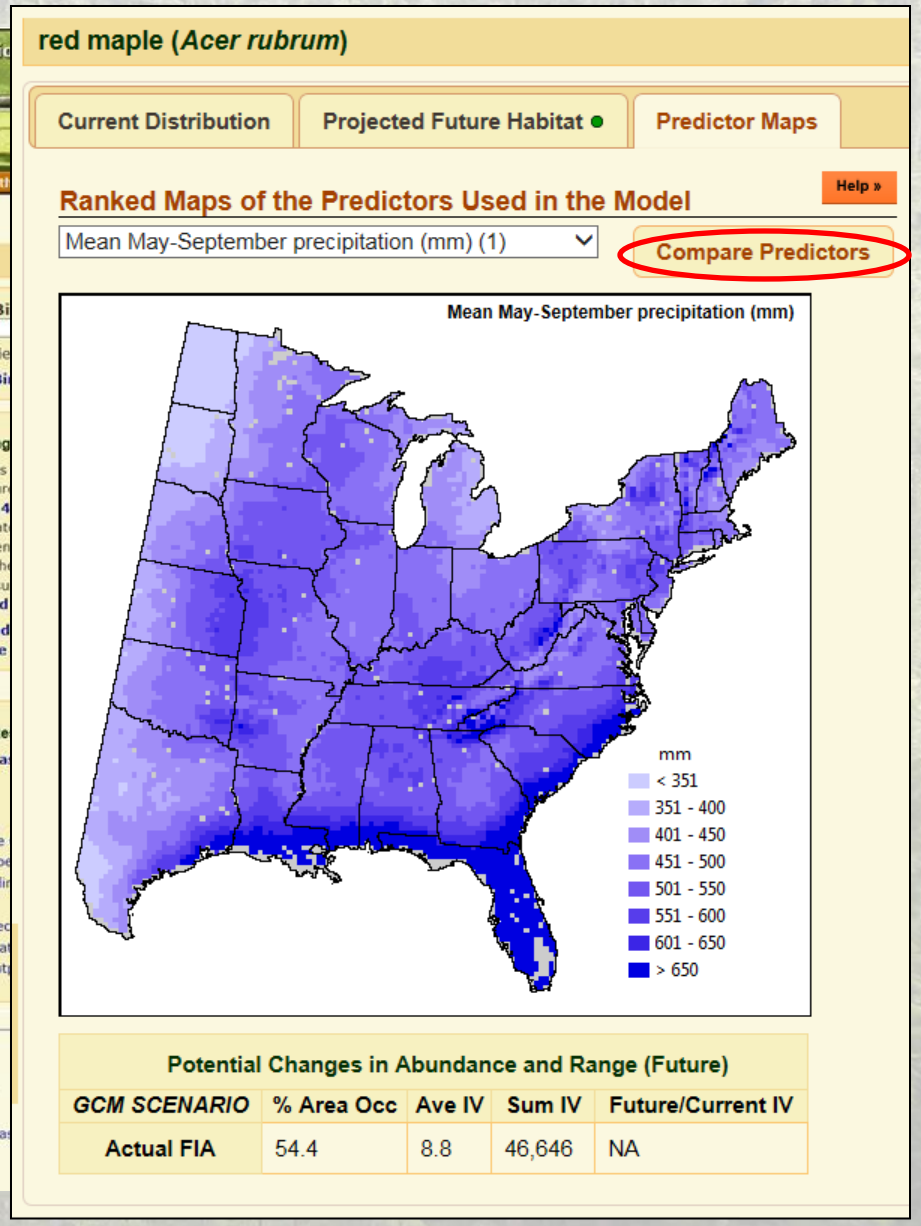


Compare Scenarios

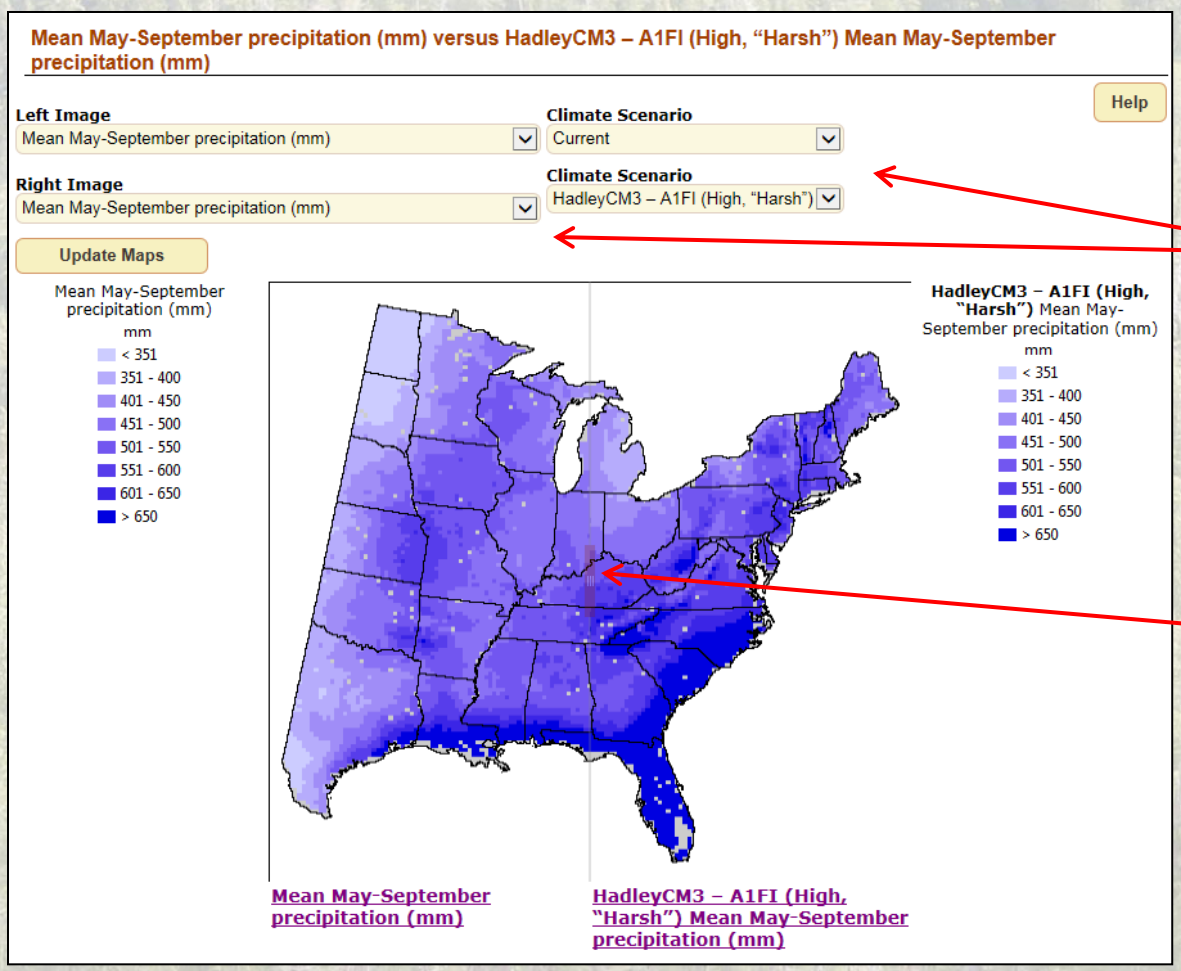


Summary of Predictors





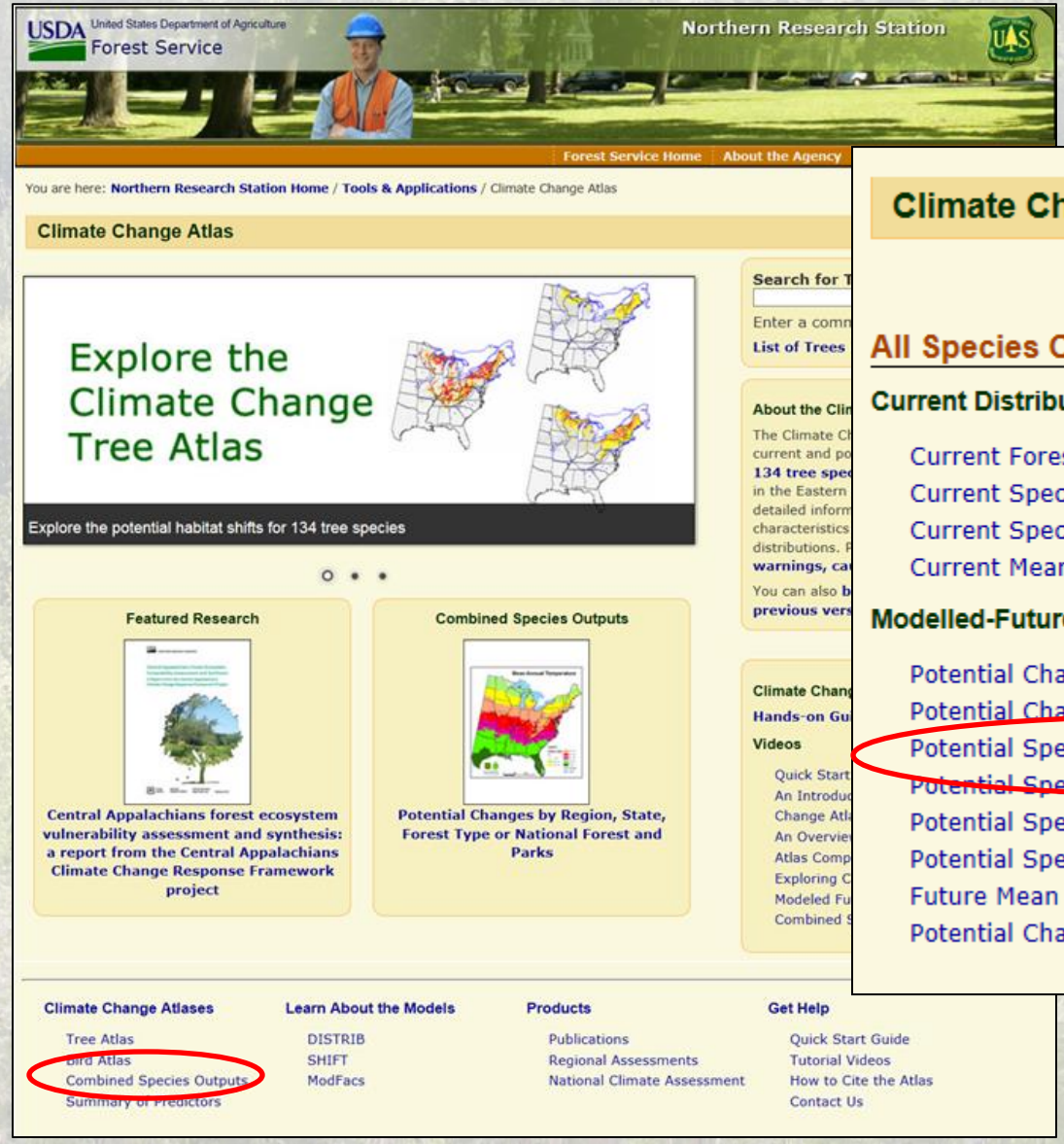
Compare Predictors

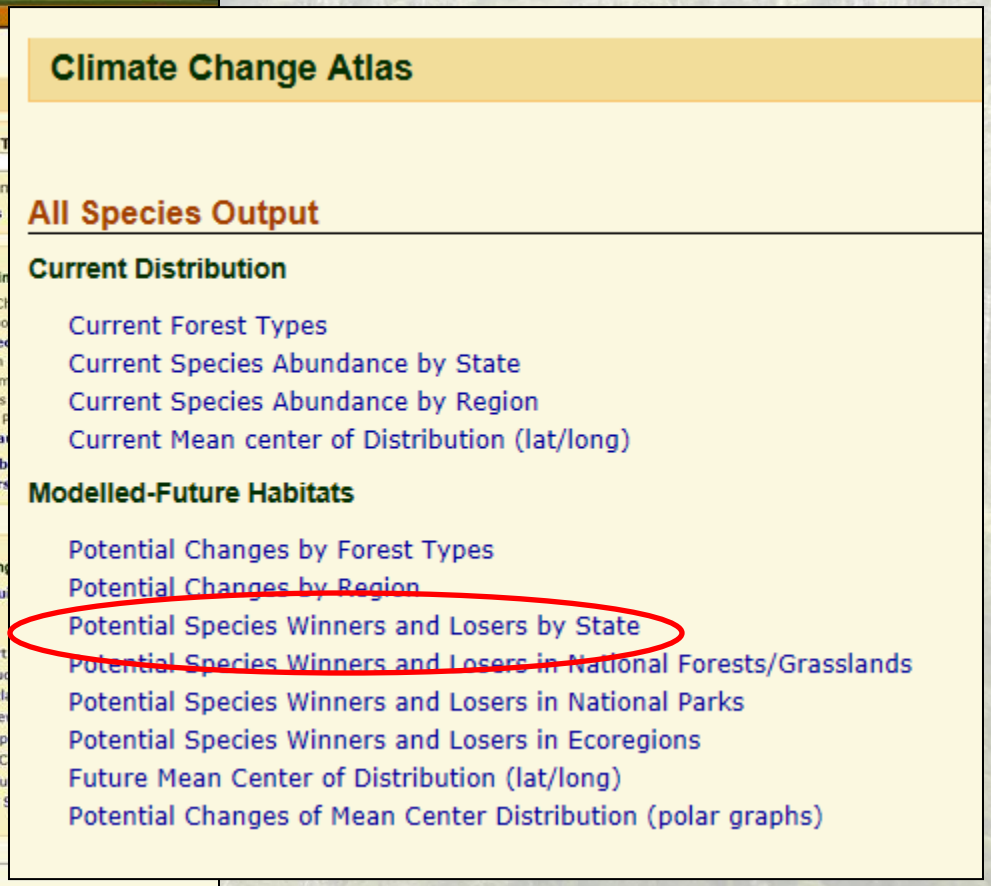


Use the drop-down menus to change the climate variables and the climate scenarios

Slide bar in the middle to compare predictors and scenarios

Species Winners and Losers





Species Winners and Losers

Species Winners and Losers by State

The links below allow you to explore products that itemize mean changes in importance values for four GCM scenarios and also look at winners and losers of species within eastern US states.

Alabama(AL); Arkansas(AR); Connecticut(CT); Delaware(DE); Florida(FL); Georgia(GA); Iowa(IA); Illinois(IL); Indiana(IN); Kansas(KS); Kentucky(KY); Louisiana(LA); Massachusetts(MA); Maryland(MD); Maine(ME); Michigan(MI); Minnesota(MN); Missouri(MO); Mississippi(MS); North Carolina(NC); North Dakota(ND); Nebraska (NE); New Hampshire(NH); New Jersey(NJ); New York(NY); Ohio (OH); Oklahoma(OK); Pennsylvania(PA); Rhode Island(RI); South Carolina(SC); South Dakota(SD); Tennessee(TN); Texas(TX); Virginia(VA); Vermont(VT); Wisconsin(WI); West Virginia(WV);

Modeled Current-Current Importance Values

"mean" IV Change from Current Modelled for: Michigan

Table of Winners & Losers: MI_mean_fz_winlose.csv

NOTE: Table is sortable (ascending & descending) by clicking on the column names

Show All entries

Spp#	SppCN	SppSN	ClimIndx	ModRely	ModCur	HadHiDif	PcmLoDif	Gcm3AvgHiDif	Gcm3AvgLoDif	IVchangeMap
12	balsam fir	Abies balsamea	3.5	1	3.47	-3.09	-2.48	-3.09	-2.96	RFmod_6pp_12.png
43	Atlantic white-cedar	Chamaecyparis thyoides	1	3	0.00	0.00	0.00	0.00	0.00	RFmod_6pp_43.png
68	eastern redcedar	Juniperus virginiana	4	2	0.05	4.06	0.74	4.18	2.08	RFmod_6pp_68.png
71	tamarack (native)	Larix laricina	2.5	1	0.84	-0.53	-0.47	-0.53	-0.47	RFmod_6pp_71.png
94	white spruce	Picea glauca	3.5	2	0.82	-0.69	-0.63	-0.69	-0.53	RFmod_6pp_94.png
95	black spruce	Picea mariana	4	1	1.47	-1.43	-1.28	-1.44	-1.42	RFmod_6pp_95.png
97	red spruce	Picea rubens	4	1	0.11	-0.05	-0.04	-0.05	-0.06	RFmod_6pp_97.png
105	jack pine	Pinus banksiana	3	1	2.44	-1.87	-1.39	-1.91	-1.62	RFmod_6pp_105.png
107	sand pine	Pinus clausa	0	2	0.00	0.00	0.00	0.00	0.00	RFmod_6pp_107.png
110	shortleaf pine	Pinus echinata	3.5	1	0.00	0.04	0.00	0.00	0.00	RFmod_6pp_110.png
111	slash pine	Pinus elliottii	2	1	0.00	0.00	0.00	0.00	0.00	RFmod_6pp_111.png
115	spruce pine	Pinus glabra	0	2	0.00	0.00	0.00	0.00	0.00	RFmod_6pp_115.png
121	longleaf pine	Pinus palustris	2.5	1	0.00	0.00	0.00	0.00	0.00	RFmod_6pp_121.png
123	Table Mountain pine	Pinus pungens	1.5	2	0.00	0.00	0.00	0.00	0.00	RFmod_6pp_123.png

Species Winners and Losers

Four Climate Change Scenarios show average importance value relative to the modeled current

"mean" IV Change from Current Modelled for: Michigan

Table of Winners & Losers: MI_mean_fz_winlose.csv

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107	sand pine	Pinus clausa	0	2	0.00	0.00	0.00	0.00	0.00	RFmod_6pp_107.png
110	shortleaf pine	Pinus echinata	3.5	1	0.00	0.04	0.00	0.00	0.00	RFmod_6pp_110.png
111	slash pine	Pinus elliottii	2	1	0.00	0.00	0.00	0.00	0.00	RFmod_6pp_111.png
115	spruce pine	Pinus glabra	0	2	0.00	0.00	0.00	0.00	0.00	RFmod_6pp_115.png
121	longleaf pine	Pinus palustris	2.5	1	0.00	0.00	0.00	0.00	0.00	RFmod_6pp_121.png
123	Table Mountain pine	Pinus pungens	1.5	2	0.00	0.00	0.00	0.00	0.00	RFmod_6pp_123.png

Species Winners and Losers

IVchangeMap loads maps to compare climate scenarios for species

"mean" IV Change from Current Modelled for: Michigan

Table of Winners & Losers: MI_mean_fz_winlose.csv

NOTE: Table is sortable (ascending & descending) by clicking on the column names

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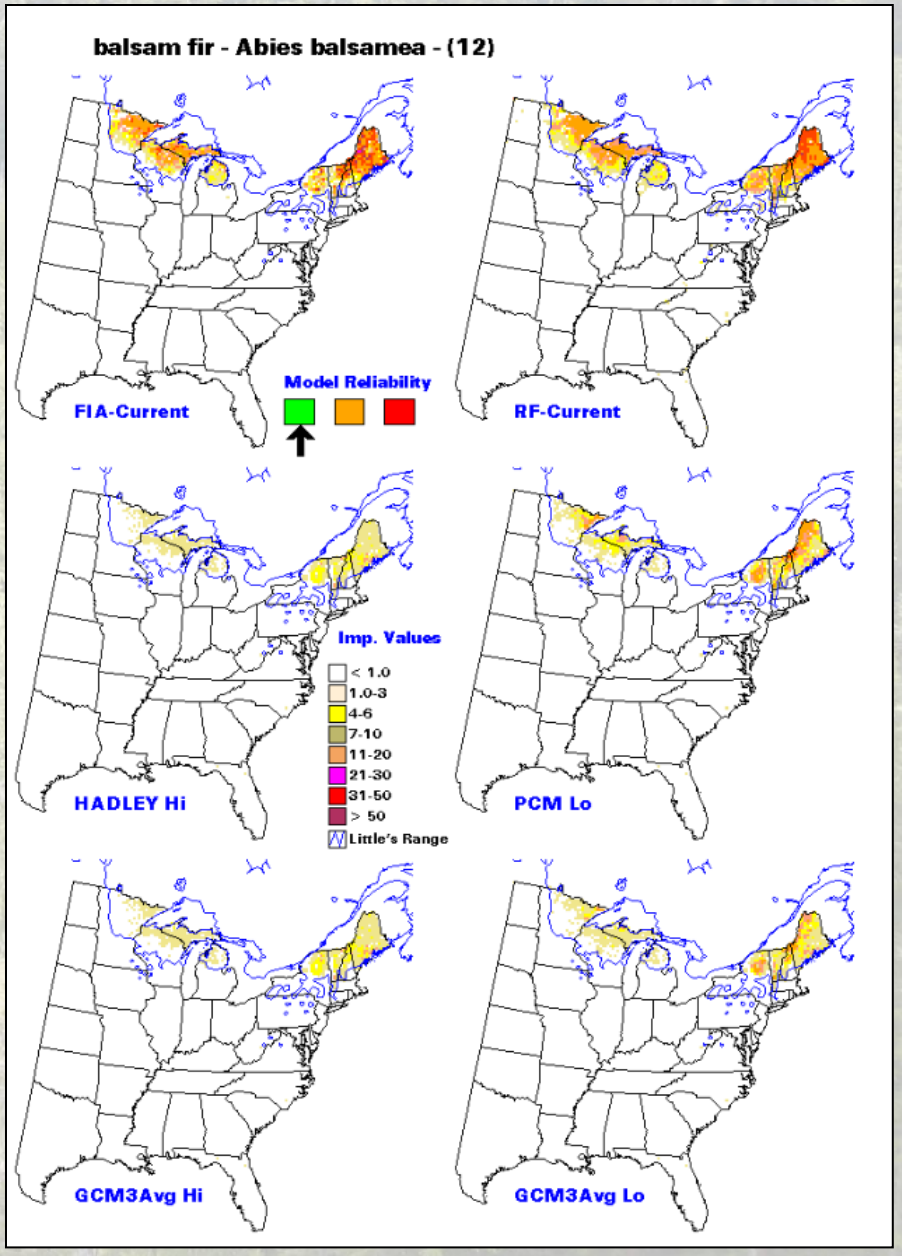
123	Table Mountain pine	Pinus pungens	1.5	2	0.00	0.00	0.00	0.00	0.00	RFmod_6pp_123.png

IVchangeMap

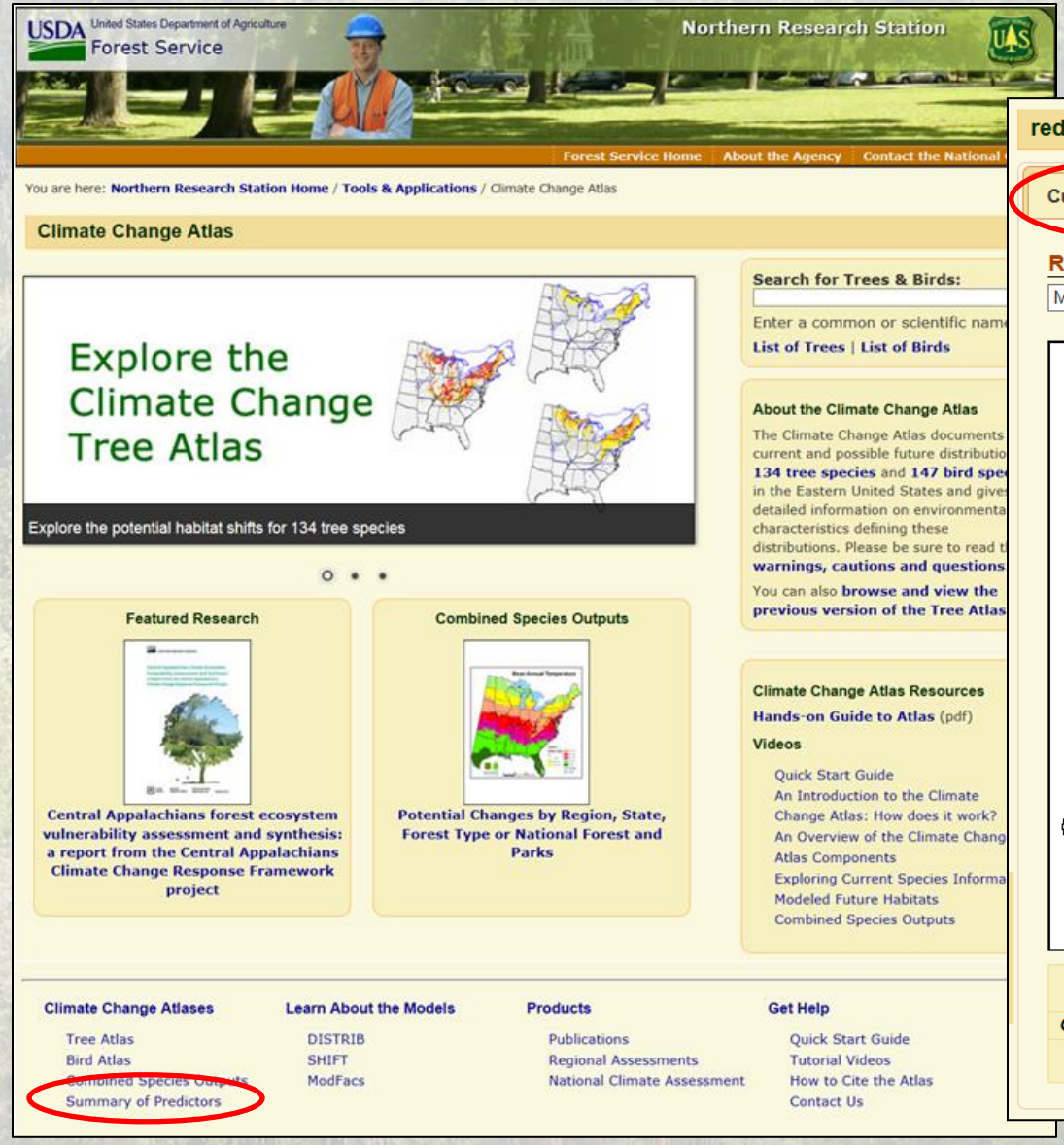
- Two maps of current distributions
  - FIA data
  - Modeled

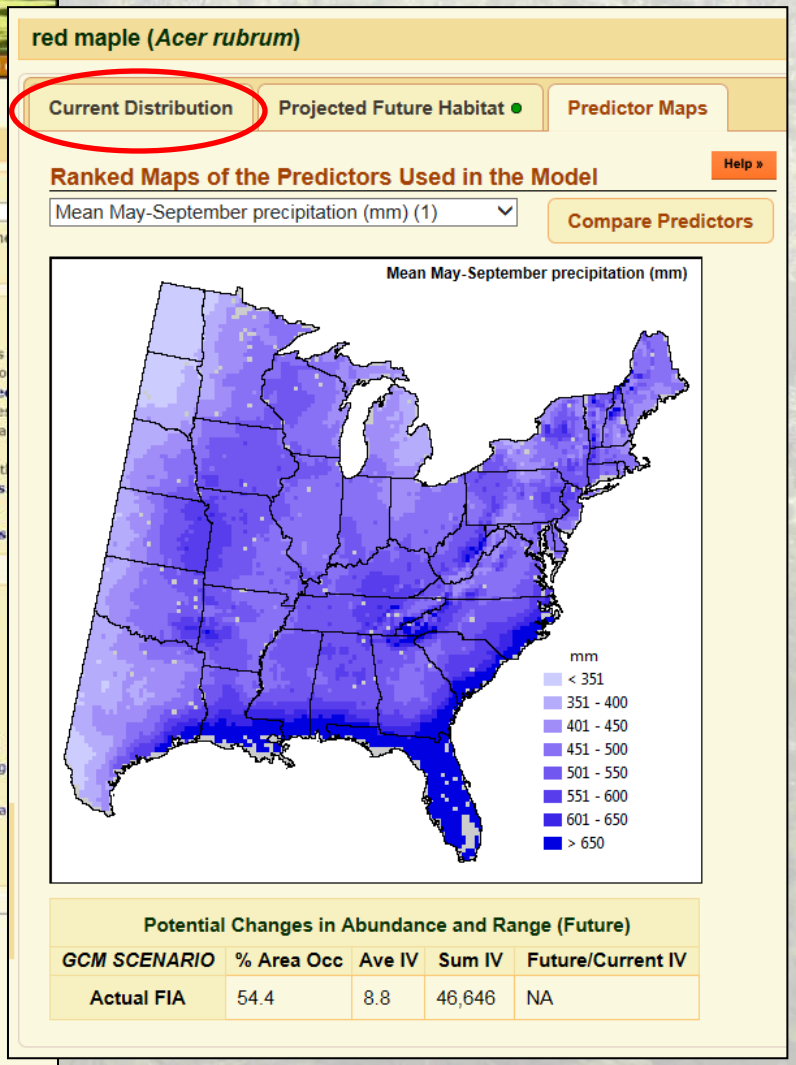
- Extremes of Climate Scenarios
  - Hadley High (most change)
  - PCM Low (least change)

- Averages of Scenarios
  - Average high emissions
  - Average low emissions



Habitat Changes by Species





Habitat Changes by Species

red maple (*Acer rubrum*)

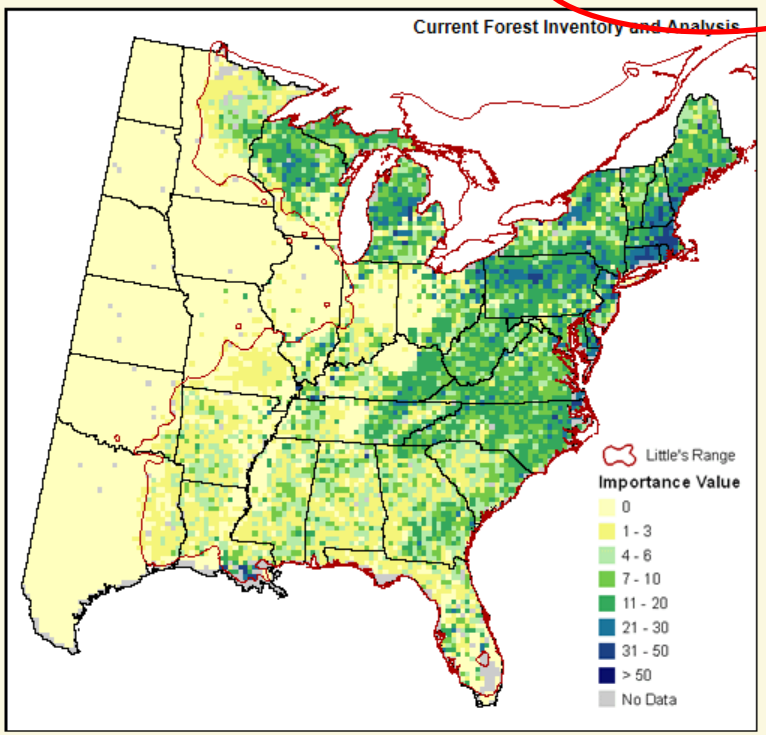
Current Distribution | Projected Future Habitat ● | Predictor Maps

Current Distribution Maps for red maple

Help »

Current Forest Inventory and Analysis

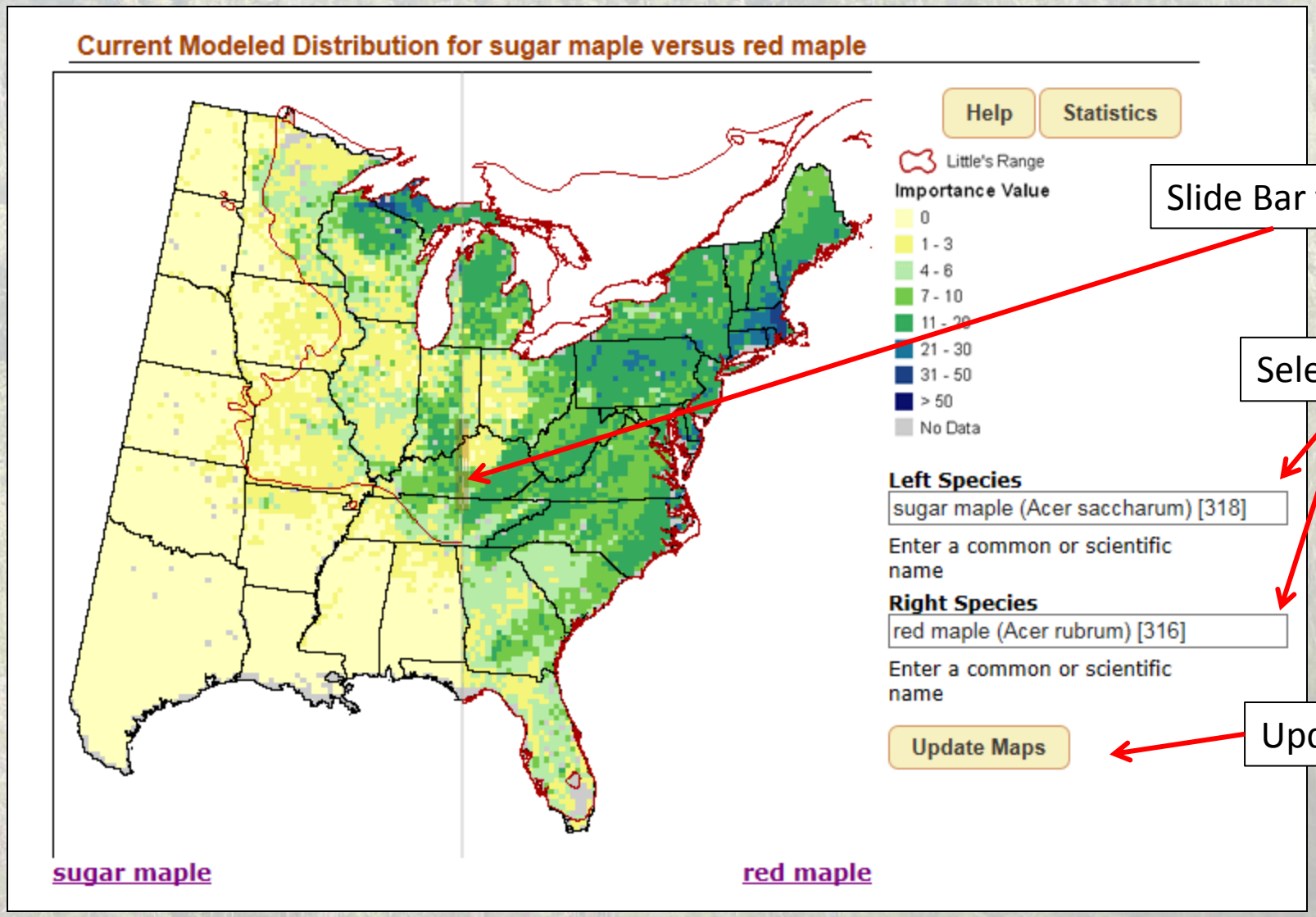
Compare Two Species



Potential Changes in Abundance and Range (Future)

GCM SCENARIO	% Area Occ	Ave IV	Sum IV	Future/Current IV
Actual FIA	54.4	8.8	46,646	NA

Habitat Changes by Species



Compare Climate Scenarios

red maple (*Acer rubrum*)

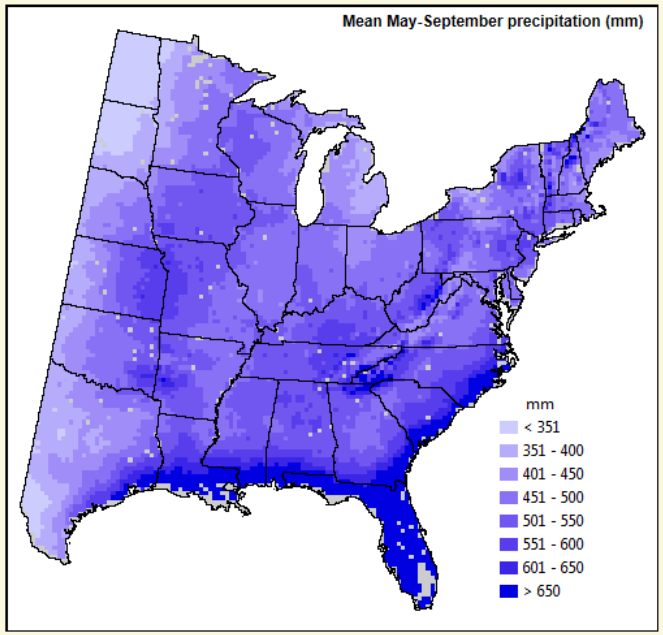
Current Distribution | Projected Future Habitat | Predictor Maps

Ranked Maps of the Predictors Used in the Model

Help »

Mean May-September precipitation (mm) (1)

Compare Predictors



Potential Changes in Abundance and Range (Future)				
GCM SCENARIO	% Area Occ	Ave IV	Sum IV	Future/Current IV
Actual FIA	54.4	8.8	46,646	NA

red maple (*Acer rubrum*)

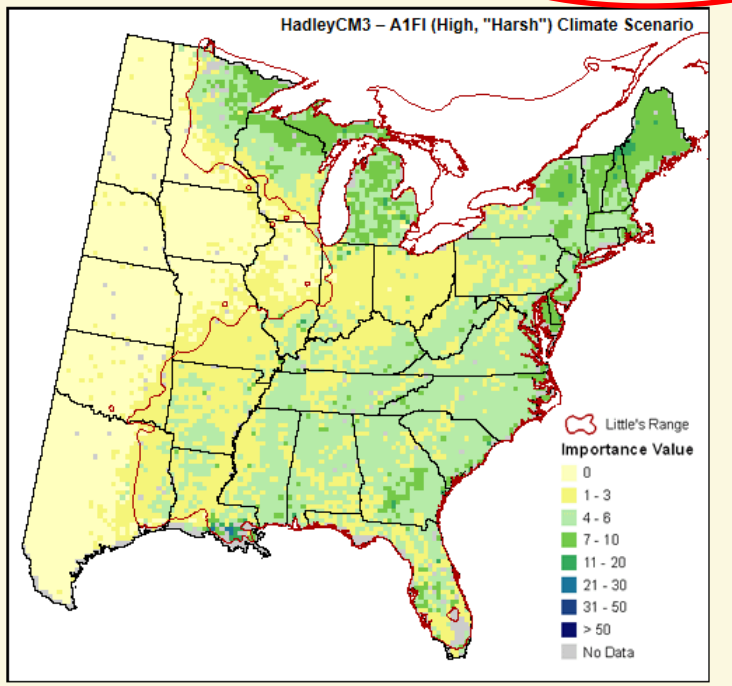
Current Distribution | Projected Future Habitat | Predictor Maps

Climate Change Scenario Maps

Help »

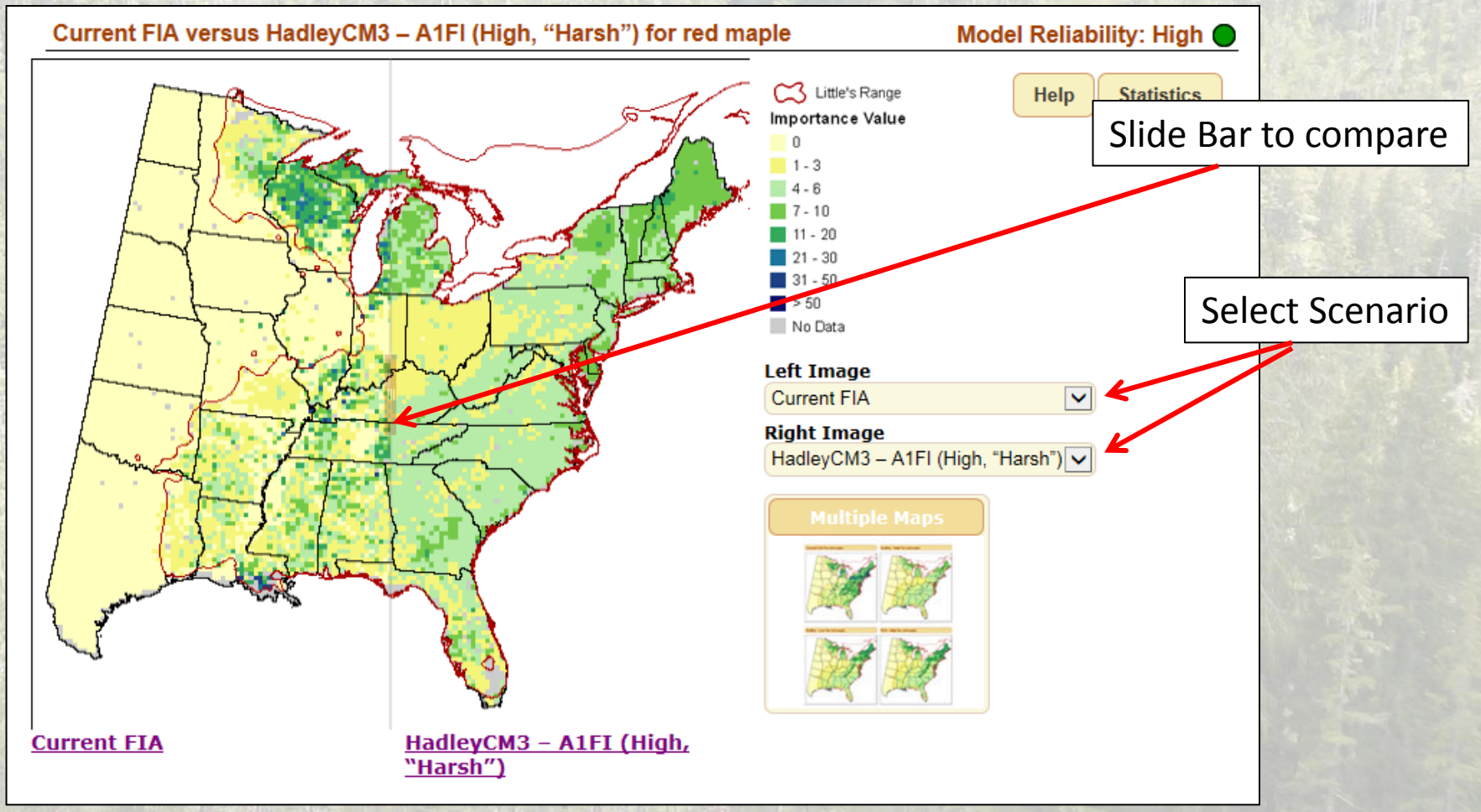
HadleyCM3 – A1FI (High, "Harsh")

Compare Scenarios



Potential Changes in Abundance and Range (Future)				
GCM SCENARIO	% Area Occ	Ave IV	Sum IV	Future/Current IV
Hadley-Hi	69.7	4.2	28,275	0.59

Compare Climate Scenarios



Questions?