GRM: Change Estimation
Task Team Update

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2017 FIA User's Group Meeting
Madison, WI

GRM Task Team Members

Team lead: Jeff Turner, SRS

Current team membership by region:

NRS	RMRS	PNWRS	SRS	UNLV
Paul Sowers	John Shaw	Olaf Keugler	Jeff Turner	Brian Cordova
Mark Hatfield	Mark Rubey	Glenn Christensen		
Chuck Barnett	Andrea Wilson	Kurt Campbell		
Pat Miles	Kyle Dodson	Hugh Luce		
		Jason Brown		

What's the Point?

FIA users want to summarize growth, removal, and mortality by all kinds of stuff:

- Ownership
  - Public, private
- Size class
  - Stand size
  - Tree diameter classes
- Temporal bases
  - Previous attributes
  - Current attributes
  - Changes within classes that change (accounting method)
- Across time periods and geographic areas that span multiple plot designs and protocols

Why is there a GRM Task Team?

- FIA has been providing annual GRM rate estimates…
  - Only in the east
    - NOTE: RMRS has a regional GM method, but not R
  - Only in terms of volume, which is estimated for the
    - merchantable bole in cubic feet
    - sawlog in board feet (International 1/4” log rule)
- The western units now have remeasured plots
  - Need methods for mid-point estimates for removal and mortality trees
  - Required adding nuances for the macroplot in PNWRS
- Users need change estimates expressed in terms of biomass and carbon
  - Added microplot for change in biomass and carbon on saplings
  - Included changes for total above ground, tops/limbs, stumps and below ground

Accomplishments

- GRM task team added PNWRS and RMRS to the production NIMS GRM compilation system in the summer 2015
  - Produced volume estimates just like in the east
  - Added new GRM data tables

Accomplishments

Biomass and carbon change estimation:

- Added new data tables to both NIMS and FIADB:
  - TREE_GRM_COMPONENT
  - TREE_GRM_MIDPOINT
  - TREE_GRM_BEGIN
  - TREE_GRM_THRESHOLD

Why not just add Biomass/Carbon GRM to TREE Table?

- These biomass estimates include microplot saplings
  - Below ground
  - Above ground

- Requires additional TPA GRM columns for microplot estimates

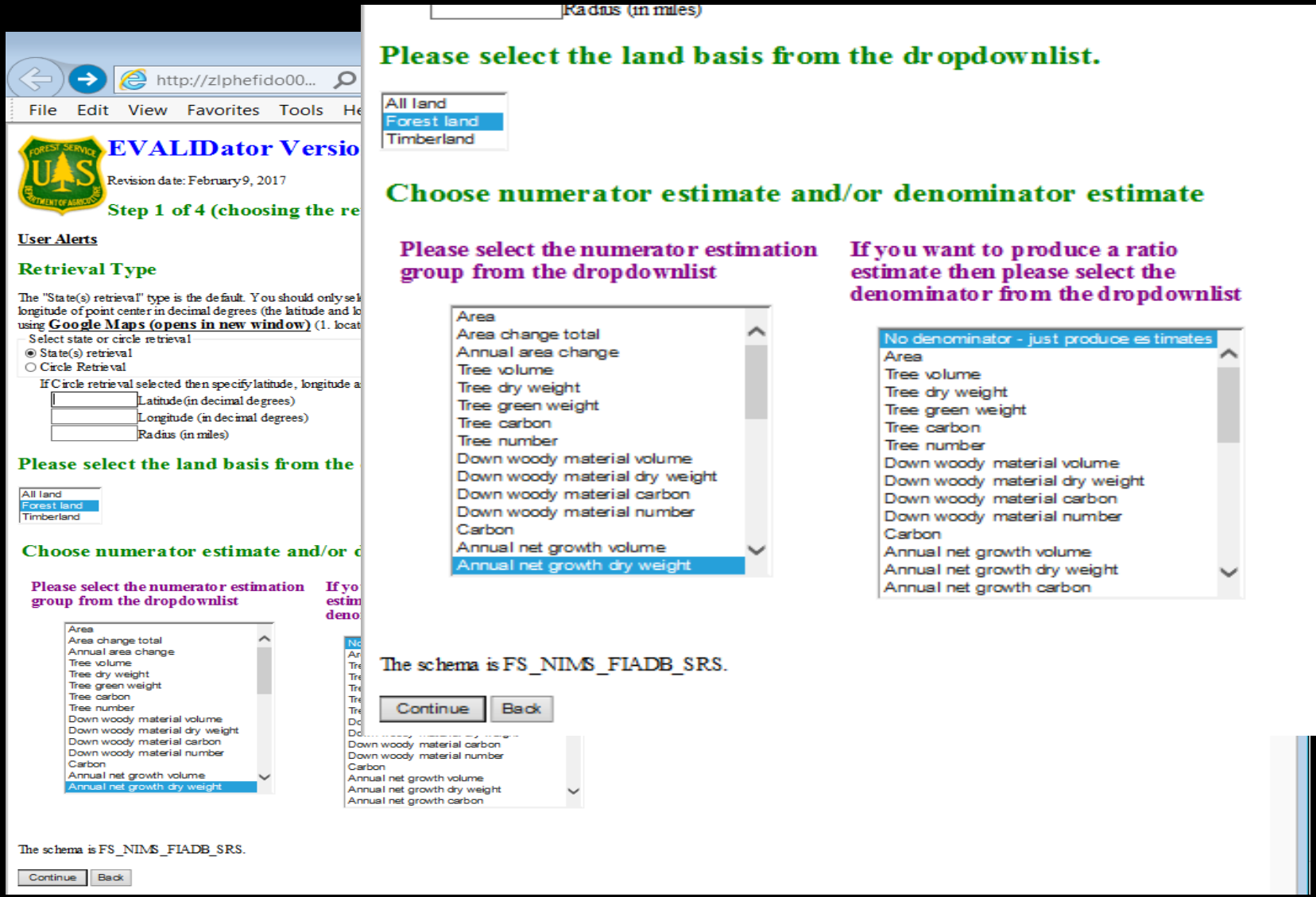
- There are six unique tree portion estimates for CRM biomass (and carbon)
  - Below ground
  - Above ground
  - Stump
  - Bole
  - Sawlog
  - Top and limbs

- Would require 30 new GRM biomass attributes for all live:
  - GROWDRYBIO_BG_AL, GROWDRYBIO_AG_AL, etc.
  - Plus another set for growing-stock and sawlog estimates
  - CRM carbon is simply one-half of the CRM biomass (no need to store those)

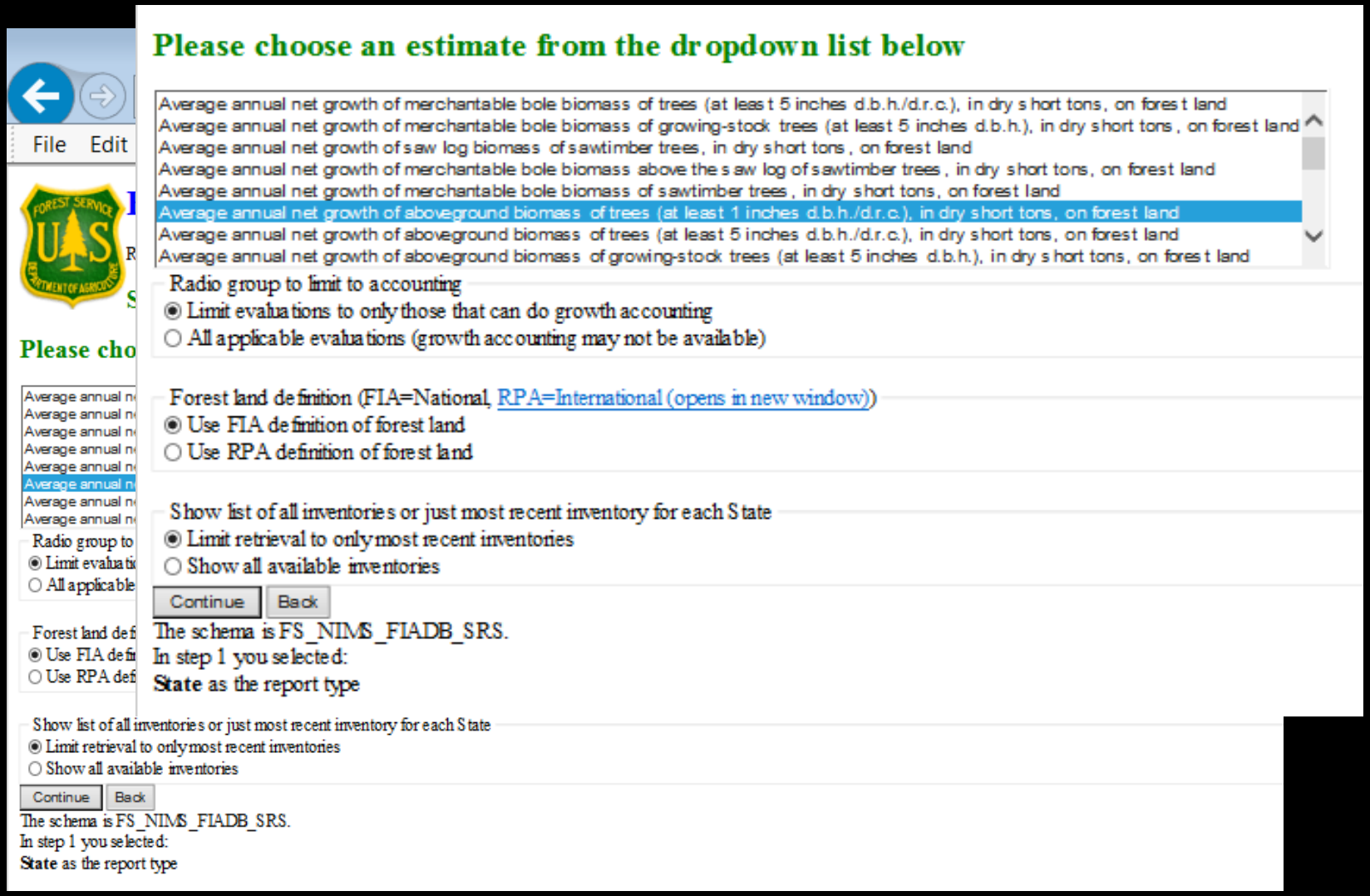
Accomplishments

- GRM in EVALIDator (ver. 1.7.0.00), due spring 2017:
  - Uses new computational method
  - Adds biomass and carbon estimates
  - New volume estimates:
    - Sawlog in cubic feet
    - Sawlog top in cubic feet
    - Merchantable bole on sawtimber trees in cubic feet

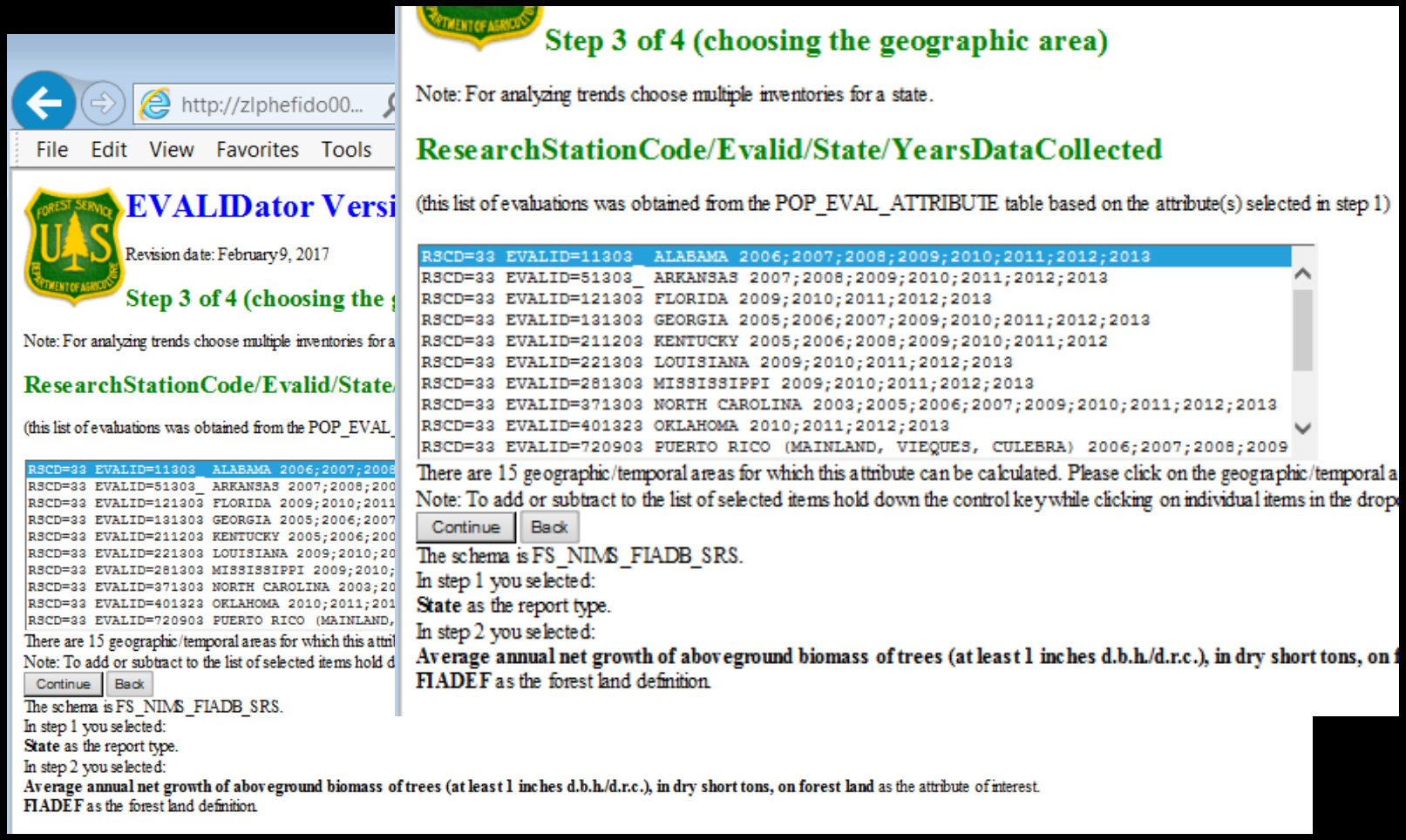
Demo Calculating Net Growth: Biomass



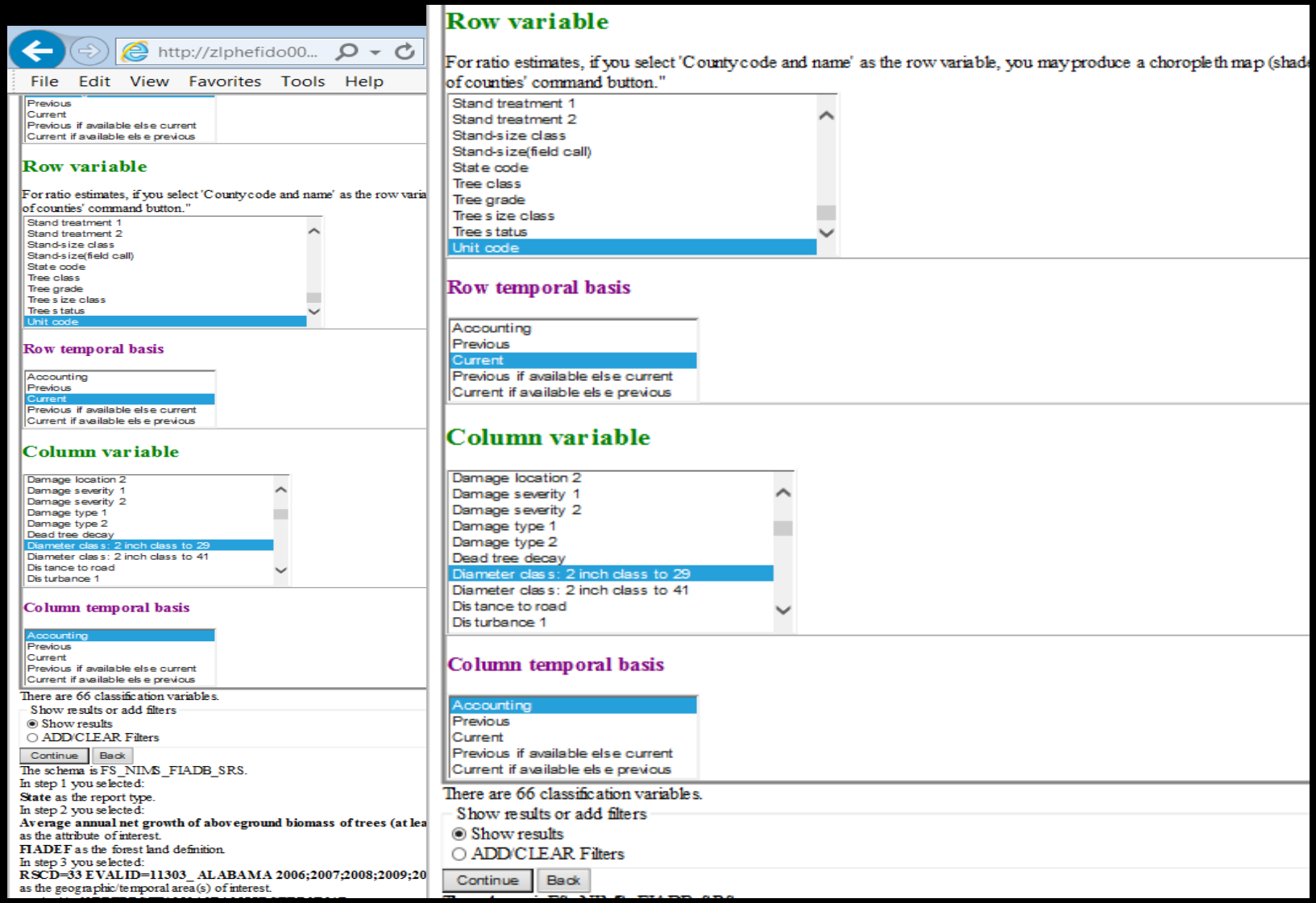
Demo Calculating Net Growth: Biomass



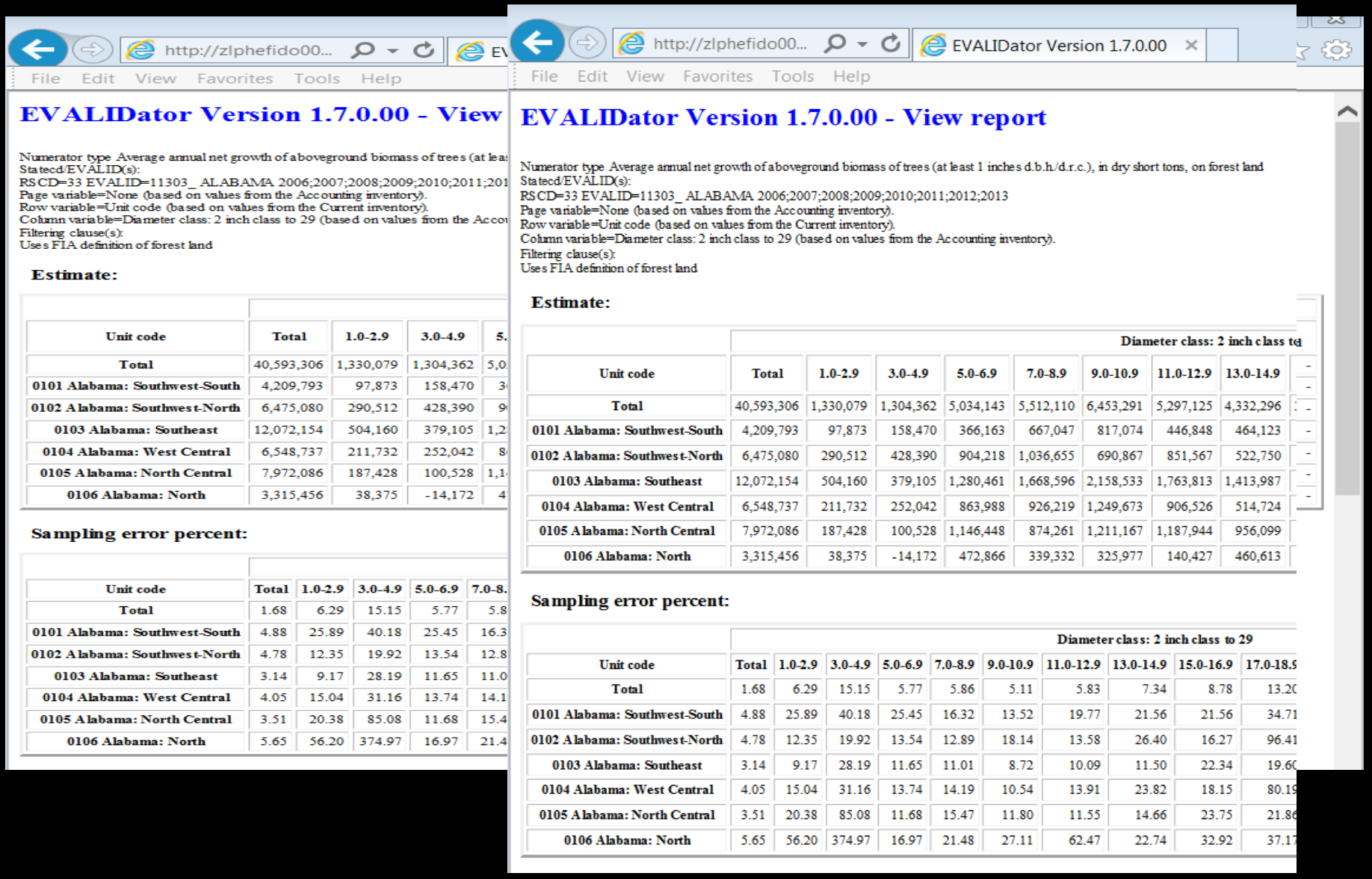
Demo Calculating Net Growth: Biomass



Demo Calculating Net Growth: Biomass



Demo Calculating Net Growth: Biomass



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EVALIDator Version 1.7.0.00 - View

Numerator type Average annual net growth of aboveground biomass of trees (at lea
Stated/EVALID(s):
RSCD=33 EVALID=11303_ ALABAMA 2006;2007;2008;2009;2010;2011;201
Page variable=None (based on values from the Accounting inventory).
Row variable=Unit code (based on values from the Current inventory).
Column variable=Diameter class: 2 inch class to 29 (based on values from the Acco
Filtering clause(s):
Uses FIA definition of forest land

Estimate:

Unit code	Total	1.0-2.9	3.0-4.9	5.
Total	40,593,306	1,330,079	1,304,362	5,0
0101 Alabama: Southwest-South	4,209,793	97,873	158,470	3
0102 Alabama: Southwest-North	6,475,080	290,512	428,390	9
0103 Alabama: Southeast	12,072,154	504,160	379,105	1,2
0104 Alabama: West Central	6,548,737	211,732	252,042	8
0105 Alabama: North Central	7,972,086	187,428	100,528	1,1
0106 Alabama: North	3,315,456	38,375	-14,172	4

Sampling error percent:

Unit code	Total	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.
Total	1.68	6.29	15.15	5.77	5.8
0101 Alabama: Southwest-South	4.88	25.89	40.18	25.45	16.3
0102 Alabama: Southwest-North	4.78	12.35	19.92	13.54	12.8
0103 Alabama: Southeast	3.14	9.17	28.19	11.65	11.0
0104 Alabama: West Central	4.05	15.04	31.16	13.74	14.1
0105 Alabama: North Central	3.51	20.38	85.08	11.68	15.4
0106 Alabama: North	5.65	56.20	374.97	16.97	21.4

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EVALIDator Version 1.7.0.00

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EVALIDator Version 1.7.0.00 - View report

Numerator type Average annual net growth of aboveground biomass of trees (at least 1 inches d.b.h./d.r.c.), in dry short tons, on forest land
Stated/EVALID(s):
RSCD=33 EVALID=11303_ ALABAMA 2006;2007;2008;2009;2010;2011;2012;2013
Page variable=None (based on values from the Accounting inventory).
Row variable=Unit code (based on values from the Current inventory).
Column variable=Diameter class: 2 inch class to 29 (based on values from the Accounting inventory).
Filtering clause(s):
Uses FIA definition of forest land

Estimate:

	Diameter class: 2 inch class to								
Unit code	Total	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	
Total	40,593,306	1,330,079	1,304,362	5,034,143	5,512,110	6,453,291	5,297,125	4,332,296	
0101 Alabama: Southwest-South	4,209,793	97,873	158,470	366,163	667,047	817,074	446,848	464,123	-
0102 Alabama: Southwest-North	6,475,080	290,512	428,390	904,218	1,036,655	690,867	851,567	522,750	-
0103 Alabama: Southeast	12,072,154	504,160	379,105	1,280,461	1,668,596	2,158,533	1,763,813	1,413,987	-
0104 Alabama: West Central	6,548,737	211,732	252,042	863,988	926,219	1,249,673	906,526	514,724	-
0105 Alabama: North Central	7,972,086	187,428	100,528	1,146,448	874,261	1,211,167	1,187,944	956,099	
0106 Alabama: North	3,315,456	38,375	-14,172	472,866	339,332	325,977	140,427	460,613	

Sampling error percent:

	Diameter class: 2 inch class to 29									
Unit code	Total	1.0-2.9	3.0-4.9	5.0-6.9	7.0-8.9	9.0-10.9	11.0-12.9	13.0-14.9	15.0-16.9	17.0-18.
Total	1.68	6.29	15.15	5.77	5.86	5.11	5.83	7.34	8.78	13.2
0101 Alabama: Southwest-South	4.88	25.89	40.18	25.45	16.32	13.52	19.77	21.56	21.56	34.7
0102 Alabama: Southwest-North	4.78	12.35	19.92	13.54	12.89	18.14	13.58	26.40	16.27	96.4
0103 Alabama: Southeast	3.14	9.17	28.19	11.65	11.01	8.72	10.09	11.50	22.34	19.6
0104 Alabama: West Central	4.05	15.04	31.16	13.74	14.19	10.54	13.91	23.82	18.15	80.1
0105 Alabama: North Central	3.51	20.38	85.08	11.68	15.47	11.80	11.55	14.66	23.75	21.8
0106 Alabama: North	5.65	56.20	374.97	16.97	21.48	27.11	62.47	22.74	32.92	37.1

Current tasks

- Completing RMRS change methodology
  - Fall 2017
- Scribner board foot volume rule
  - Fall 2017

So what's next for the GRM Team?

- Standing dead change estimates
- All land change estimation
  - Currently we have forest land and timberland
  - Need urban change estimation
- Link with PPD/Sample Organization
  - Allow for additional flexibility in processing/analysis
  - Remove as much hard coding as we can while remaining sane