

Leveraging TPO data to characterize timber flow & utilization

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Western Forest Economists Meeting

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Bureau of Business and Economic Research

- The University of Montana, Missoula
- Research branch within UM College of Business
- Regional economic analysis
- Survey research
- Industry analysis
 - Health care
 - Manufacturing
 - Energy
 - Forest products



Forest Products Industry

- ▶ Existing milling infrastructure & capacity
- ▶ Timber harvest by species, ownership and product type
- ▶ Utilization of timber and primary product manufacturing
- ▶ Log availability, supply & prices



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ABOUT FOREST INDUSTRY RESEARCH



BBER's Forest Industry Research Program is one of the largest departments of its kind in the country. With 10 staff members, the program's work covers the western region, monitoring forest products operations in Montana, Alaska, Arizona, California, Colorado, Idaho, New Mexico, Oregon, Utah, and Wyoming, and its research focuses on the forest industry's size, diversity, and economic impacts.

Work with our long-term cooperators, like the USDA Forest Service's Forest Inventory and Analysis (FIA) Program, as well as with new ones, is increasingly related to carbon sequestration, woody biomass for fuel and energy, and economic sustainability of the wood products industry and surrounding communities.

Partners

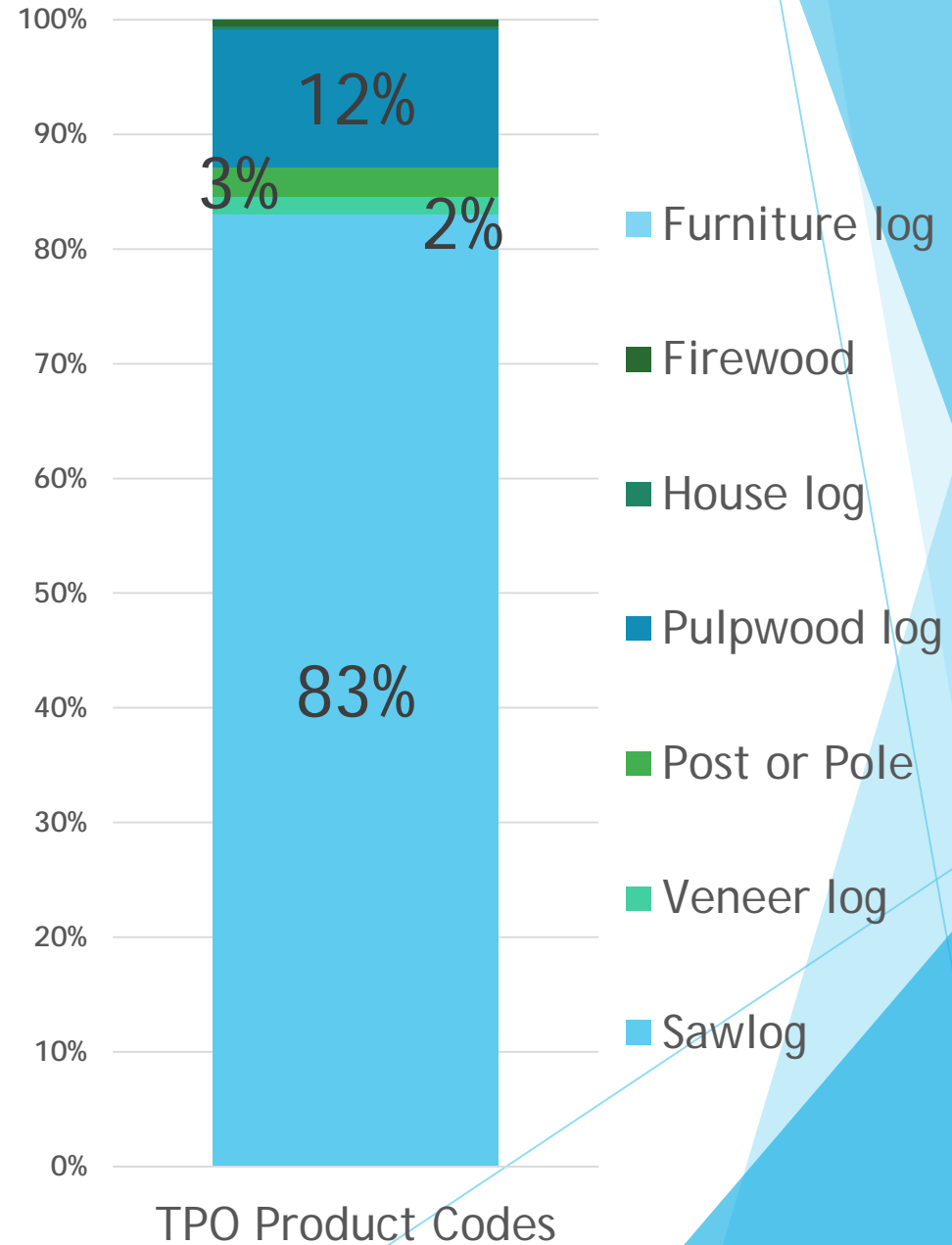
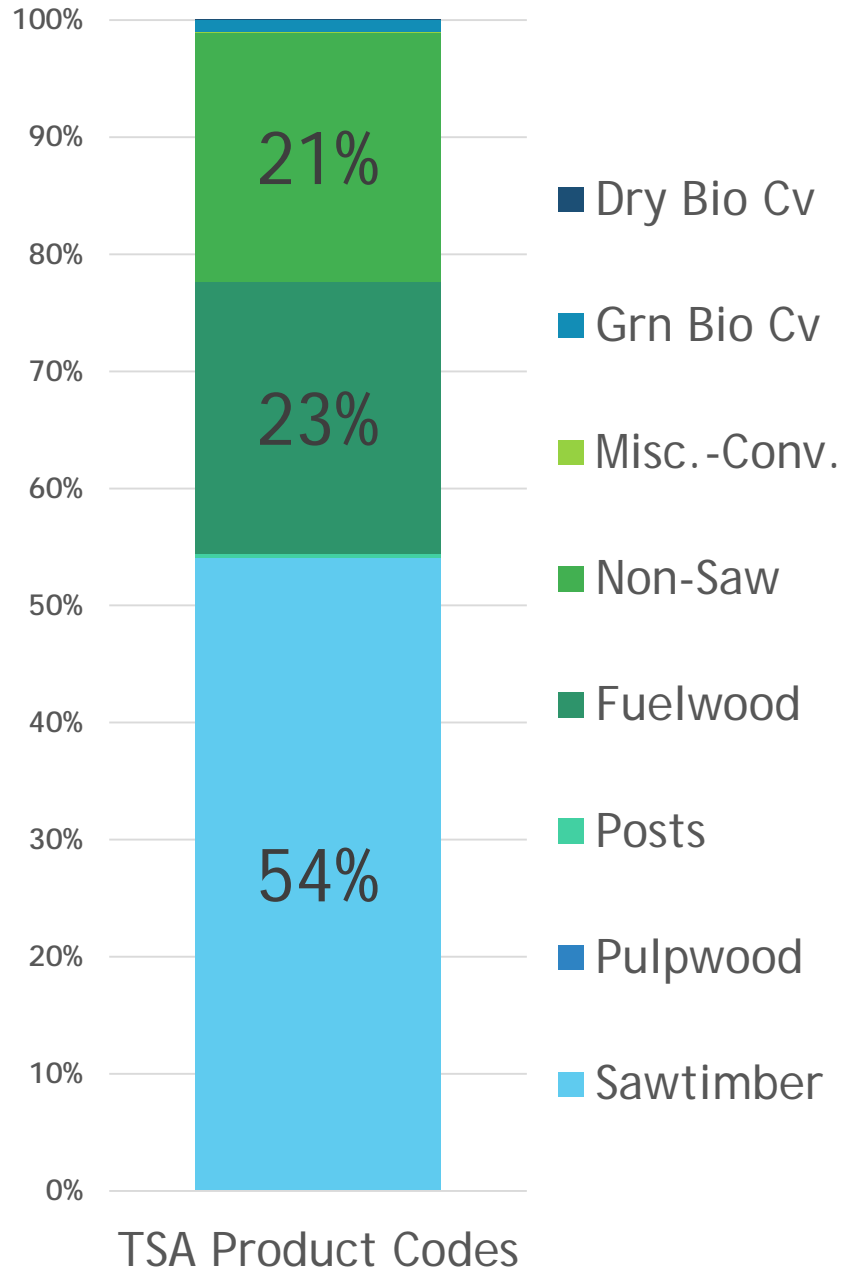
- Interior West Forest Inventory and Analysis Program
- Pacific Northwest Forest Inventory and Analysis Program
- University of Idaho, Dept. of Renewable Materials
- Northwest Advanced Renewables Alliance (NARA)
- FIA Database Retrieval System
- TPO Database Retrieval System
- USDA Forest Service Northern Region



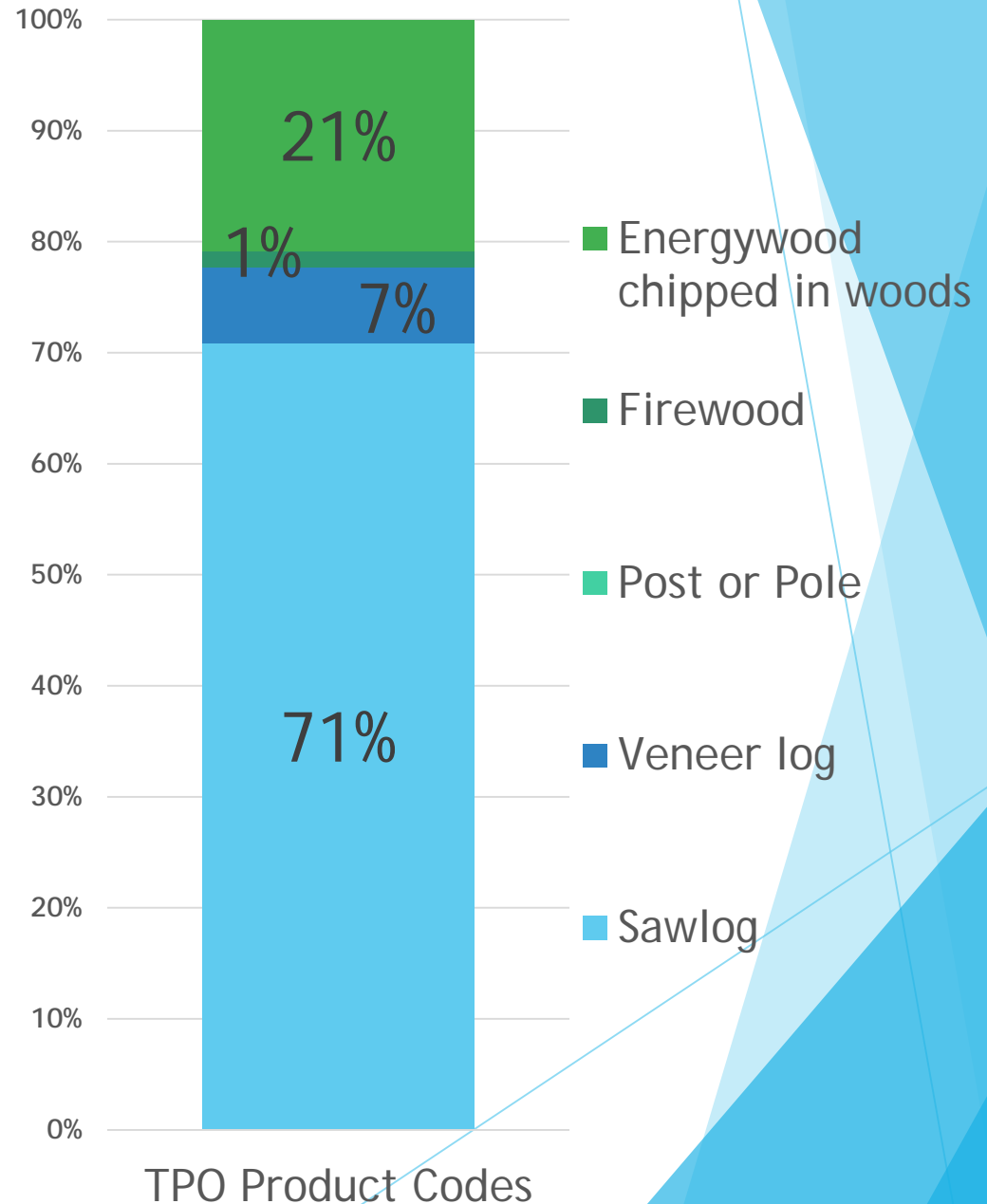
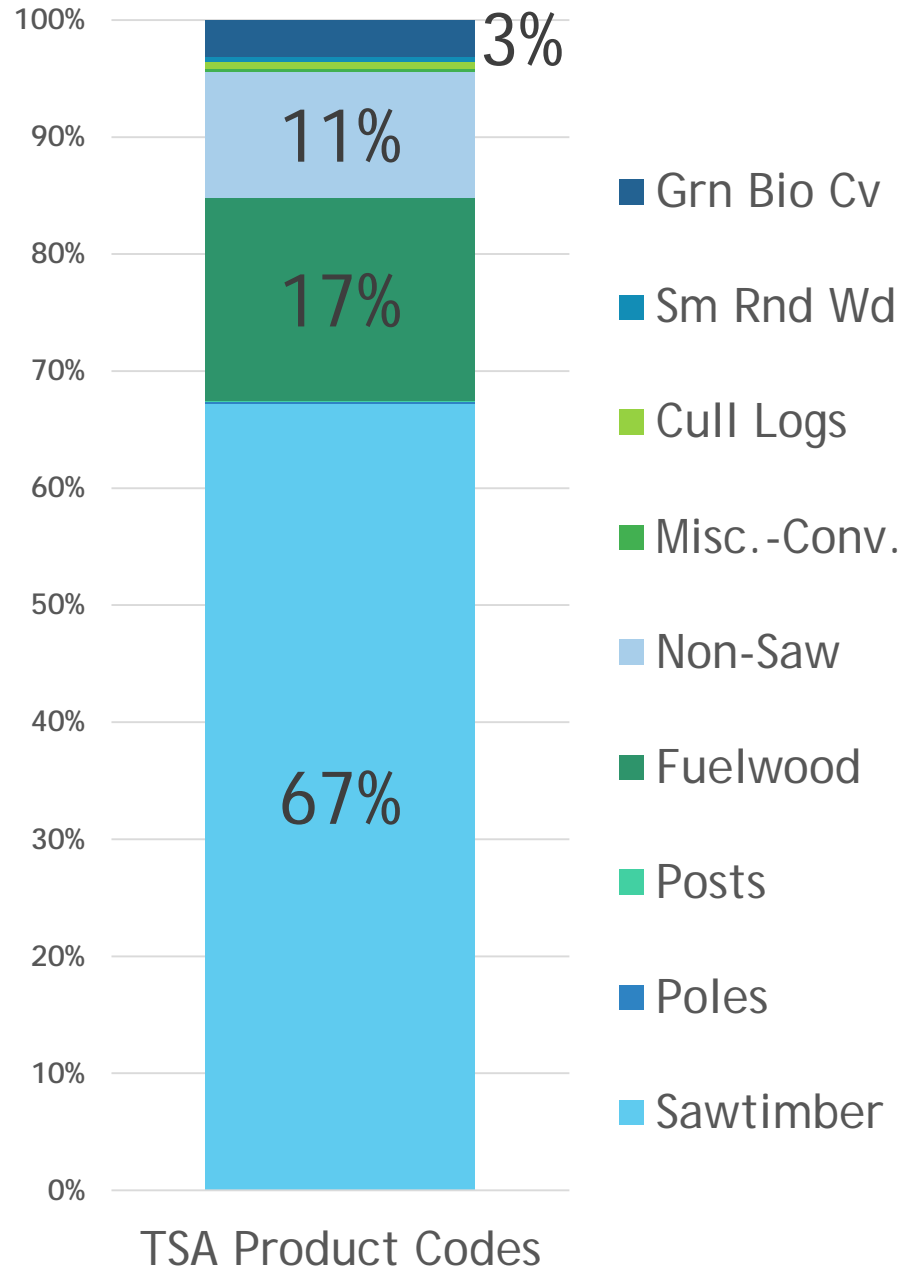
Where do federal logs go and how are they utilized?

NFS timber harvest tracking

Region 1 - 2014 Timber Harvest



Region 5 - 2012 Timber Harvest



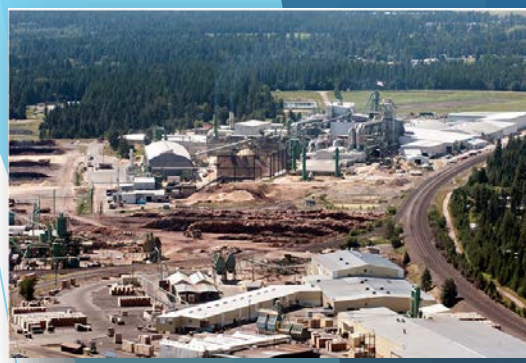
The Problem

1

- ▶ Predicted vs. Actual Use
 - ▶ Lagging merchantability specs
 - ▶ Changes in industry utilization practices
- ▶ TSA product categories not exhaustive
- ▶ Fuelwood (07) not a commercial product
- ▶ Unutilized material

2

- ▶ Tracking of harvested NFS timber
- ▶ Load tickets, load count or other quantification methods
- ▶ Recorded in Timber Sale Accounting (TSA) database
 - ▶ Inconsistent entry characterizing/identifying receiving mills
 - ▶ Barrier to understanding timber flow & utilization



Timber Products Output (TPO) Data

- ▶ National characterization of timber removals by product type
 - ▶ Timber harvested for products
 - ▶ Associated logging residue (slash)
 - ▶ Mill residue
- ▶ Periodic mill censuses in western states - TPO “plus”
 - ▶ Harvest by county, **owner** and species
 - ▶ **Location**, **type** and capacity of receiving mills
 - ▶ Timber volume processed by species, owner and size
 - ▶ Volume and **type of products** produced





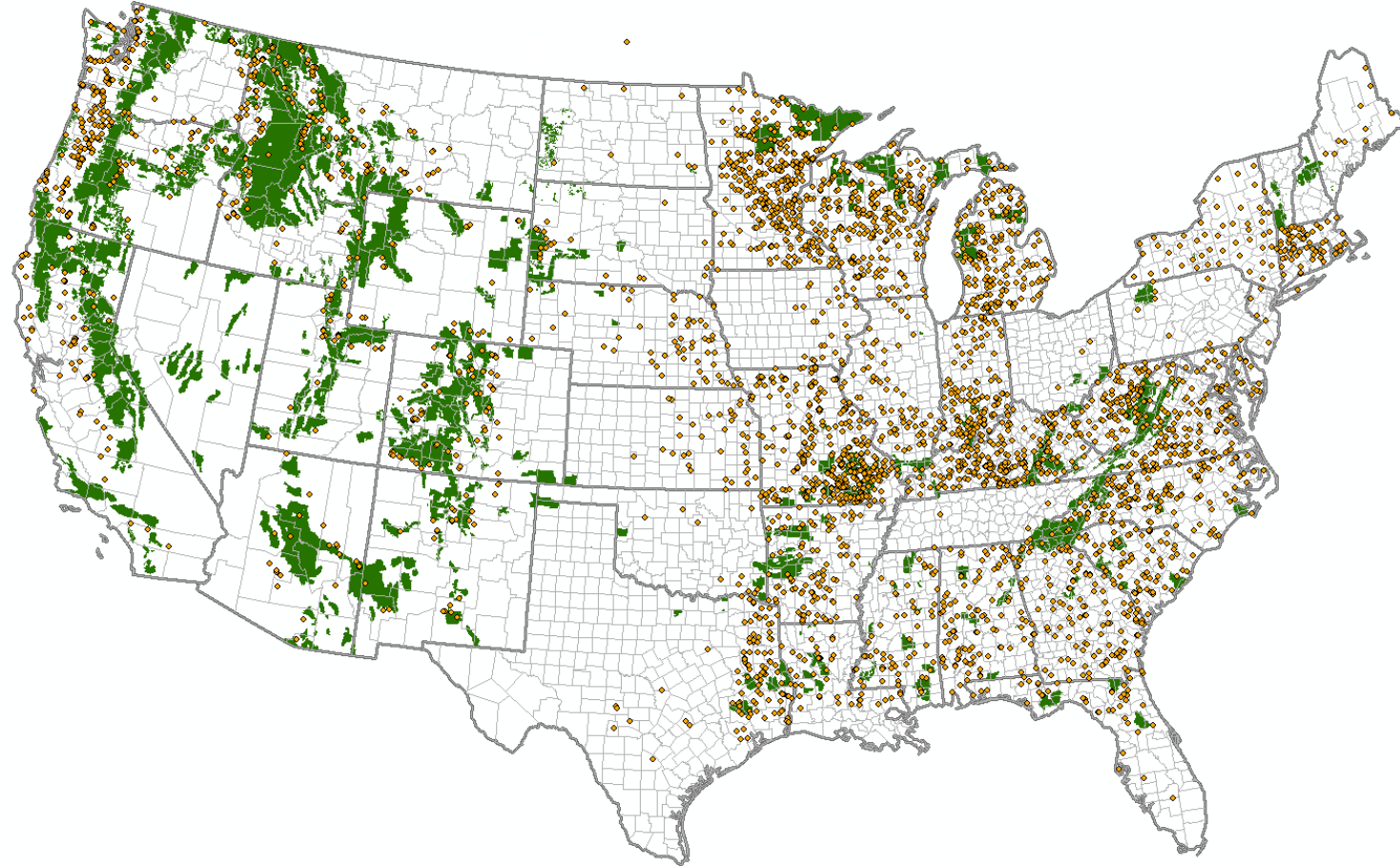
Objective

Leverage mill-level TPO data to help characterize national forest timber flow & utilization

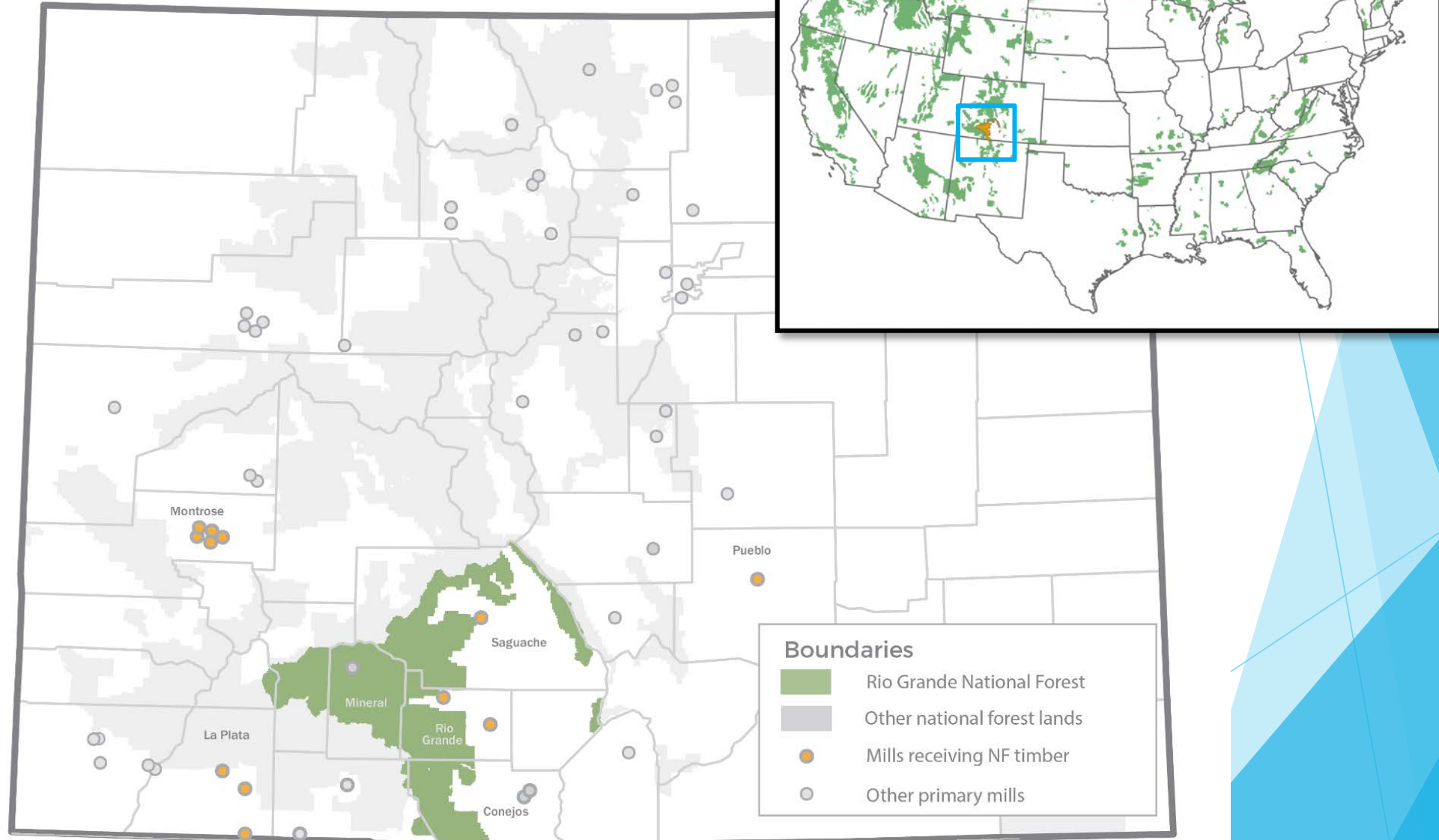
- ▶ Identify counties receiving and processing National Forest System timber
- ▶ Attach mill type and product information to harvest volume
- ▶ Crosswalk TSA and TPO data to inform how NFS timber is utilized

National NFS Timber Flow

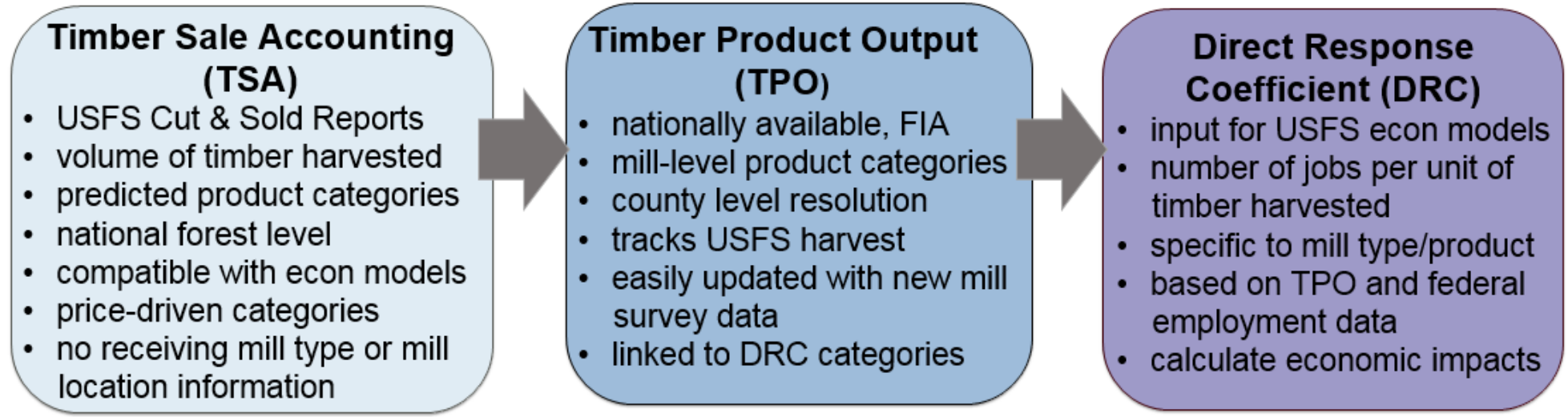
- ▶ USFS Cut & Sold Reports
- ▶ Western TPO data (ownership, county and product)
- ▶ Eastern TPO data (county and product)
 - ▶ Timber harvest from national forest by county and year
 - ▶ Geospatial analysis of counties containing national forest



Rio Grande NF



TPO as a bridge



Data crosswalk table of proportional USFS timber harvest volume by product for the Rio Grande National Forest, 2012

AdminUnit	County Name	State	State FIPS	County FIPS	Sawtimber			Misc.-Conv.			Fuelwood	
					Sawlog	Firewood	House log	Sawlog	House log	Post or pole		Not utilized
					Sawmill-soft	Post/pole	Log home	Sawmill-soft	Log furniture	Post/pole		n/a
Rio Grande	La Plata	CO	41	011	0%	0%	1%	0%	0%	0%		
Rio Grande	Montrose	CO	41	015	2%	0%	0%	3%	0%	0%		
Rio Grande	Pueblo	CO	41	019	14%	0%	0%	16%	0%	0%		
Rio Grande	Rio Grande	CO	41	029	55%	0%	19%	64%	9%	0%		
Rio Grande	Saguache	CO	41	039	5%	0%	5%	6%	2%	0%		
					76%	0%	24%	89%	11%	0%		100%

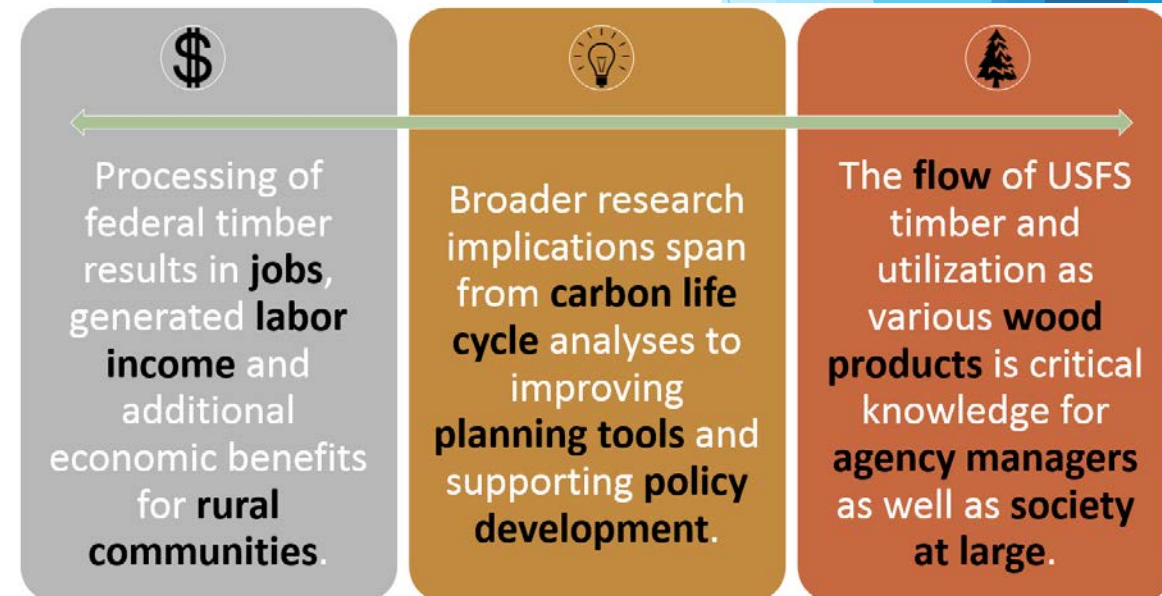
NFS economic impact analysis

- ▶ Prioritizing goals, projects and policy implementation
- ▶ Assess how USFS actions impact people and communities
- ▶ Estimating changes in employment, labor income and industry output
- ▶ Location and size of economic impact generated by timber harvest
- ▶ Where and how value is added to NFS timber



And beyond!

- ▶ Inform transaction evidence appraisal systems
- ▶ Potential enhancement of decision support tools
- ▶ Carbon sequestration in harvested wood products (HWP) modeling
- ▶ Non-USFS economic impact analysis
- ▶ Pace and scale of restoration
- ▶ Rural community stability & partnerships



Thank you!

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Photo: Columbia Falls, MT
Credit: Mick Ruis, 2016
Cityofcolumbiafalls.org



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USFS: Stewards of the public lands

- ▶ Sustain the health, diversity and productivity of national forests
- ▶ Challenges of wildfire management and fuel treatment
- ▶ Insect, disease and drought mitigation
- ▶ Rural community stability and partnerships



Product Category Comparison

TSA Product Categories	
01	Sawtimber
02	Pulpwood
03	Poles
04	Pilings
06	Posts
07	Fuelwood
08	Non-Saw
09	Ties
14	Misc.-Conv.
18	Cull Logs
19	Sm Rnd Wd
20	Grn Bio Cv
21	Dry Bio Cv

TPO Product Category	
001	Saw log
002	Veneer log
003	Post or Pole
004	House log
005	Fiber log
006	Pulpwood log
007	Cedar log
008	Pulpwood chipped in woods
009	Firewood
010	Furniture log
011	Energywood log
012	Viga log
013	Piling or Utility pole
014	Energywood chipped in woods
015	Other fiber log chipped in woods

Region 1 - 2014 Timber Harvest

TSA Product Categories		
01	Sawtimber	54.07%
02	Pulpwood	0.02%
03	Poles	
04	Pilings	
06	Posts	0.29%
07	Fuelwood	23.25%
08	Non-Saw	21.30%
09	Ties	
14	Misc.-Conv.	0.12%
18	Cull Logs	
19	Sm Rnd Wd	
20	Grn Bio Cv	0.96%
21	Dry Bio Cv	0.001%

TPO Product Category		
001	Saw log	83.03%
002	Veneer log	1.50%
003	Post or Pole	2.61%
004	House log	0.30%
005	Fiber log	
006	Pulpwood log	12.01%
007	Cedar log	
008	Pulpwood chipped in woods	
009	Firewood	0.54%
010	Furniture log	0.003%
011	Energywood log	
012	Viga log	
013	Piling or Utility pole	
014	Energywood chipped in woods	
015	Other fiber log chipped in woods	

Region 5 - 2012 Timber Harvest

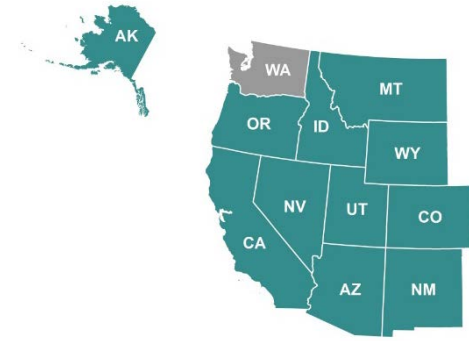
TSA Product Categories		
01	Sawtimber	67.20%
02	Pulpwood	
03	Poles	0.20%
04	Pilings	
06	Posts	0.04%
07	Fuelwood	17.34%
08	Non-Saw	10.82%
09	Ties	
14	Misc.-Conv.	0.23%
18	Cull Logs	0.62%
19	Sm Rnd Wd	0.42%
20	Grn Bio Cv	3.13%
21	Dry Bio Cv	

TPO Product Category		
001	Saw log	70.91%
002	Veneer log	6.78%
003	Post or Pole	0.03%
004	House log	
005	Fiber log	
006	Pulpwood log	
007	Cedar log	
008	Pulpwood chipped in woods	
009	Firewood	1.44%
010	Furniture log	
011	Energywood log	
012	Viga log	
013	Piling or Utility pole	
014	Energywood chipped in woods	20.84%
015	Other fiber log chipped in woods	

TPO



FIDACS



TPO Mill Surveys

- Annual sample of primary industry (proposed national base program)
- **Timber products & mill residue**
- In-state & out-of-state timber
- Residue types & uses
- Broad product categories

FIDACS Mill Surveys

- Periodic census of primary industry
- Processors in- & out-of-state
- Employment & other info
- **Complete wood accounting**
- Timber from in-state & out-of-state
- Residue types, volumes & uses
- Sales value and **volumes of primary products**

Table 1. Employment Direct Response Coefficients by Industry Sector and Region

(number of jobs per MMCF of timber harvested, excluding fuelwood)

Industry Sector	Alaska	CA/NV	WA/OR	MT/ID	Four Corners	WY/SD	North Central	West Southeast	East Southeast	Hardwood	Northeast
Forestry & logging	14	18	11	12	32	14	15	9	8	18	22
Softwood sawmills	20	15	12	14	17	12	14	9	11	15	12
Hardwood sawmills	a	a	a	a	a	a	28	30	28	26	25
Residue (sawmills)	2	3	5	5	6	4	4	4	4	4	4
Softwood plywood/veneer	a	a	31	32	a	a	a	17	22	a	a
Hardwood plywood/veneer	a	a	a	a	a	a	80	80	80	80	80
Residue (plywood/veneer)	a	a	4	4	a	a	4	4	4	4	4
OSB and other structural composite panels	a	a	a	a	a	a	8	8	8	8	8
Roundwood for pulp and paper	a	9	9	9	9	a	9	9	9	9	9
Energy - large	a	2	2	2	2	a	2	2	2	2	2
Energy - small	10	10	10	10	10	10	10	10	10	10	10
Other mills											
Post and pole	a	15	15	14	15	15	a	30	30	a	a
Utility pole	a	14	14	14	14	14	a	11	11	a	a
House log / log home	100	100	100	100	100	100	75	75	75	75	75
Log furniture	125	125	125	125	125	125	125	125	125	125	125
Residue (other mills)	2	2	2	2	2	2	2	2	2	2	2
States in each region	Alaska	California Nevada	Oregon Washington	Idaho Montana	Arizona Colorado New Mexico Utah	Wyoming South Dakota	Michigan Minnesota Wisconsin	Arkansas Louisiana Oklahoma Texas	Alabama Florida Georgia Mississippi North Carolina South Carolina Virginia	Illinois Indiana Iowa Kentucky Maryland Missouri Ohio Pennsylvania Tennessee West Virginia	Connecticut Delaware Maine Massachusetts New Hampshire New Jersey New York Rhode Island Vermont

^aValue not reported either due to lack of industry in the region, or to maintain confidentiality of existing operations.

Methods



1. Compile Cut & Sold volumes by national forest and product
 - identify TSA predicted product categories, by volume (MBF)
2. Query TPO data by national forest, product type and receiving county
 - filter by geographic area of interest (i.e., national forest)
 - calculate proportion of each TPO product volume by county
3. Identify crosswalk between TSA product volume and TPO categories
 - allocate TSA volume across reported TPO product categories
 - assess where TSA volume may have not been utilized for commercial products
 - calculate proportion of each TSA product category associated with TPO product
4. Crosswalk TSA product category to direct response coefficients (DRC)
 - calculate proportion of TSA product attributed to each DRC
 - account for 100% of each TSA product category, by TPO product or unutilized

