

Appendix: Methods

Map Data Sources

County boundaries	<p>Title: County Boundaries for the State of Idaho Redistricting 2001 Process Originator: Idaho Legislative Services Office Publication date: 2001 Data type: vector digital data Data location: http://cloud.insideidaho.org/data/ilso/counties_id_ilso.shp</p>
Forest/non-forest vegetation cover	<p>Title: Contiguous U.S. Forest/Non-forest Map Originator: USDA Forest Service Forest Inventory and Analysis, Geospatial Technology and Applications Center Publication date: 2008 Data type: remote-sensing image Data location: https://data.fs.usda.gov/geodata/rastergateway/biomass/</p>
Land ownership	<p>Title: Surface Management Agency (SMA) for Idaho Originator: U.S. Bureau of Land Management Publication date: 2016 Data type: polygon digital data Data location: http://cloud.insideidaho.org/data/blm/RLTY_SMA_PUB_24K_POLY.shp</p>
Roads	<p>Title: State Highway System Originator: Idaho Transportation Department Publication date: 2019 Data type: line Data location: https://gis.itd.idaho.gov/arcgisprod/rest/services/ArcGISOnline/IdahoTransportationLayersForOpenData/MapServer/131</p> <p>Title: Idaho National Highway System Originator: Idaho Transportation Department Publication date: 2019 Data type: line Data location: https://gis.itd.idaho.gov/arcgisprod/rest/services/IPLAN/Functional_Classification/MapServer/7</p>
Cities and towns	<p>Title: USA Census Populated Places Originator: ESRI and U.S. Census Bureau Publication date: 2018 Data type: point Data location: https://services.arcgis.com/P3ePLMYs2RVChkJx/arcgis/rest/services/USA_Census_Populated_Places/FeatureServer</p>
Shaded relief	<p>Title: World Shaded Relief Originator: ESRI Publication date: 2009 Data type: jpeg image Data location: https://services.arcgisonline.com/ArcGIS/rest/services/World_Shaded_Relief/MapServer</p>

Forest Land Ownership

Mapping locations and determining the amount of forest land at the county level in Idaho was complicated because a single, pre-existing geospatial dataset did not exist and had to be created. A commonly cited source for the amount of forest land in Idaho is that developed by the USDA Forest Service's Forest Inventory and Analysis (FIA) program (USDA Forest Service 2019). FIA uses the Resources Planning Act (RPA) definition of forest land, which is land at least 120 feet wide and at least one acre in size with at least 10% cover by live trees (Oswalt et al. 2014). FIA estimates of forest land are based on permanent sample plots spread across the landscape that are periodically re-measured and then scaled up to county, state, and national level estimates. Counties are the building blocks for FIA estimates of forest land (Reams et al. 2005). However, FIA estimates of forest land within a county are not available geospatially (i.e., they are not associated with specific locations within a county). In other words, FIA reports the number of acres of forest land within a county, not the location of those forest lands.

Researchers have developed a geospatial dataset of forest land using FIA plot data and several geospatial data layers including satellite imagery, climate, and topographic variables (USDA Forest Service 2008; Blackard et al. 2008). The dataset includes forest/non-forest vegetation information. However, estimates of the amount of forest land at the county level are not consistent between this geospatial dataset and those reported with FIA's non-spatial data. In addition, this geospatial dataset does not include land ownership information.

The U.S. Bureau of Land Management (BLM) maintains a geospatial dataset of the surface management agency (SMA) for all lands in the U.S. (BLM 2016). In almost all cases the surface management agency is also the owner of the land. Surface management agencies in the dataset are categorized into federal, state, and private ownership categories. However, the SMA dataset does not include vegetation (i.e., forest/non-forest) information.

The forest land ownership maps in this *Idaho Forest Factbook* were created by overlaying the USDA Forest Service forest/non-forest data layer with the BLM SMA data layer. However, total forest land and forest land by ownership acreage estimates at the county level obtained by this method were not consistent with FIA estimates. Because the building blocks of FIA estimates are counties and FIA estimates are widely cited, we considered them to be a more authoritative source than our map-based estimates. Therefore, we adjusted the acreage estimates shown in the Forest Land Ownership tables for each county proportionately to FIA-based statewide totals. Individual county estimates are not the same as FIA reports, but the sum of all counties is consistent with the FIA statewide total. County acreage totals were rounded to the nearest thousand acres.

In addition, reserved/non-reserved status for federal forest lands is important because it indicates whether the lands are available for timber harvest. Reserved forest land has been withdrawn from timber utilization by statute or administrative designation (e.g., wilderness). Estimates of reserved federal forest lands in the Forest Land Ownership tables of this *Idaho Forest Factbook* are based on proportions reported by FIA.

Timber Harvest by Ownership

2017 was the most recent calendar year for which timber harvest volume data by ownership at the county level were available. Timber harvest volume data for private lands, including industrial, non-industrial, and tribal lands, were provided by the Idaho Department of Lands, as were harvest data from state lands. Harvest data for federal lands, including USDA Forest Service and BLM, were compiled by the Forest Industry Research Program at the University of Montana (BBER 2019). Timber harvest volumes at the county level were rounded to the nearest million board feet.

Economic Data Sources and Methods

The economic measures—jobs, annual wage income, gross domestic product, and establishments—included in the forest products industry (FPI) were based on the North American Industrial Classification System (NAICS 2012). The aggregated FPI sector consists of Forestry and Logging (NAICS 3-digit 113), Support Activities for Forestry (NAICS 6-digit 115310), Wood Product Manufacturing (NAICS 3-digit 321), and Paper Manufacturing (NAICS 3-digit 322).

The principal source for employment and wage income data for Idaho counties was the U.S. Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW). 2016 was the most recent year for which county-level data were available (BLS 2016). QCEW publishes quarterly counts of the number of establishments, employment and wages for workers covered by state unemployment insurance (UI) laws at the 6-digit NAICS level of aggregation for all U.S. counties. An establishment is a single economic unit—such as a farm, a factory, or a store—that produces goods or services, and is typically at one physical location and engaged in one, or predominantly one, type of economic activity. Employment data represent the number of covered workers who worked during, or received pay for, the pay period that included the 12th day of the month. Average annual employment, or jobs, represents the annual average of the monthly employment data. Annual wage income represents the total compensation paid during the calendar quarter, regardless of when the services were performed.

While QCEW covers over 95 percent of all US jobs, it excludes proprietors, unincorporated self-employed, unpaid family members, and certain farm and domestic workers from having to report employment data. BLS withholds the publication of UI-covered employment and wage data for any industry level when necessary to protect the identity of cooperating employers. As a result, QCEW datasets available for states and counties for public use may contain missing or “undisclosed” employment or wages statistics to avoid identifying individual businesses. The Policy Analysis Group used various statistical methods (e.g., Zhang and Guldmann, 2013; Zhang and Guldmann, 2009; Register, et al., 2012) to estimate missing data elements to produce 6-digit NAICS employment and wage data for Idaho counties.

The source for county-level Gross Domestic Product (GDP) data was the U.S. Bureau of Economic Analysis (BEA) “Prototype Gross Domestic Product by County, 2012-2015” data series (BEA 2018). GDP is the value of production, or the value-added, that occurs within the geographic boundaries of each county. An industry’s value-added is the difference between its gross output (sales and other operating income, commodity taxes, and inventory change) and its intermediate inputs (purchases of goods and services from other industries that are used in production). 2016 GDP for Idaho counties was derived by the Policy Analysis Group by applying the “shift-share” method (Stevens and Moore, 1980) to the 2012-2015 series. The FPI’s share of county GDP was estimated with a similar shift-share method. 6-digit NAICS wages (a component of GDP) for each county’s FPI was used as the principal estimator.

References Cited

- BEA (Bureau of Economic Analysis, U.S. Department of Commerce). 2018. “Prototype Gross Domestic Product by County, 2012-2015” data series, <https://www.bea.gov/data/gdp/gdp-county>.
- BBER (Bureau of Business and Economic Research, University of Montana). 2019. Forest Industry Research Program, Harvest and Industry. <http://www.bber.umt.edu/FIR/HarvestID.aspx>.
- Blackard, J.A., M.V. Finco, E.H. Helmer, G.R. Holden, M.L. Hoppus, D.M. Jacobs, A.J. Lister, G.G. Moisen, M.D. Nelson, R. Riemann, B. Ruefenacht, D. Salajanu, D.L. Weyermann, K.C. Winterberger, T.J. Brandeis, R.L. Czaplewski, R.E. McRoberts, P.L. Patterson, and R.P. Tymcio. 2008. Mapping U.S. forest biomass using nationwide forest inventory data and moderate resolution information. *Remote Sensing of the Environment* 112:1658-1677.
- BLM (Bureau of Land Management, U.S. Department of the Interior). 2016. BLM National Surface Management Agency Area Polygons - National Geospatial Data Asset (NGDA). <https://catalog.data.gov/dataset/blm-national-surface-management-agency-area-polygons-national-geospatial-data-asset-ngda>.
- BLS (Bureau of Labor Statistics, U.S. Department of Labor). 2016. Quarterly Census of Employment and Wages. <https://www.bls.gov/cew/cewover.htm>.
- NAICS (North American Industry Classification System). 2012. North American Industry Classification System. <https://www.census.gov/eos/www/naics/index.html>.
- Oswalt, S.N., W.B. Smith, P.D. Miles, and S.A. Pugh. 2014. Forest resources of the United States, 2012: a technical document supporting the Forest Service 2015 update of the RPA assessment. Gen. Tech. Rep. WO-91. Washington, DC: U.S. Department of Agriculture, Forest Service, Washington Office. 218 p.
- Reams, G.A., W.D. Smith, M.H. Hansen, W.A. Bechtold, F.A. Roesch, and G.G. Moisen. 2005. The Forest Inventory and Analysis sampling frame. Pages 11-26 in The Enhanced Forest Inventory and Analysis Program—National Sampling Design and Estimation Procedures, W.A. Bechtold and P.L. Patterson, eds. Gen. Tech. Rep. SRS-80. Asheville, NC: USDA Forest Service, Southern Research Station. 85 p.
- Register, D.L., D.M. Lambert, B.C. English, K. L. Jensen, R.J. Menard, and J.P. Brown. 2012. “Imputation of Suppressed CBP Employment Records”. Poster presented at the Agricultural and Applied Economics Association 2012 Annual Meeting, August 12-14, 2012, Seattle, Washington.
- Stevens, B., and C. Moore. 1980. “A critical review of the literature on shift-share as a forecasting technique”. *Journal of Regional Science* 20(4):419. doi:10.1111/j.1467-9787.
- USDA Forest Service. 2008. Contiguous U.S. forest/non-forest map. <https://data.fs.usda.gov/geodata/rastergateway/biomass/>.
- USDA Forest Service. 2019. EVALIDator Version 1.8.0.00. <https://apps.fs.usda.gov/Evalidator/evalidator.jsp>.
- Zhang, S., and J.M. Guldmann. 2009. “Estimating Suppressed Data in Regional Economic Databases: A Goal-Programming Approach”. *European Journal of Operational Research* 192(2009): 521-537.
- Zhang, S., and J.M. Guldmann. 2013. “A Regression-constrained Optimization Approach to Estimating Suppressed Information using Time-series Data: Application to County Business Patterns 1999–2006”. *International Regional Science Review* 2015, Vol. 38(2) 119-150.