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The 2019 Washington State Agland Database



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Our Work

- **Parcel Database**: a statewide, normalized, spatially-explicit database of parcel and tax roll data for Washington State.
- Forestland Database: integrates the Parcel Database with physical, biological, regulatory, and economic data to identify and attribute all forest parcels and landowners in Washington State.
- Agland Database: integrates the Parcel Database with physical, biological, regulatory, and economic data to identify and attribute all agricultural landowners in Washington State.





Background & Funding

- 1999: Salmon Recovery Act (RCW 76.13.110) required reporting
- 2001: UW developed the first spatially explicit map of family forestlands
- 2001-2007: Various DNR, WDFW contracts
- 2005/2007: Family Forest Foundation and Washington Farm Forestry
 Association lobbied for and received federal appropriation. Directed to UW.
- 2006: Founded the Parcels Working Group
- 2007: Created the Washington State Parcel Database
- 2009: Created the Washington State Forestland Database
- Five versions have been developed: 2007, 2009, 2010, 2012, and 2019
- An Agland Database has been in discussion since 2015
- Synergy with ESSB 5330 allowed us to create a statewide database instead of just Puget Sound area





Parcels Working Group

- Diverse group of agency personnel meets bi-monthly
- Purpose
 - ...construct a single, regularly updated, statewide parcel dataset...
 - ...reduce the cost, inefficiencies, and redundant efforts of state and federal agencies, as each independently and periodically contacts parcel data originators for current data sets...
 - ...support, where needed, local efforts involved in developing and maintaining parcel data..
 - ...identify and address data distribution concerns...

Local

Counties, Washington State
 Association of County Assessors

State

 CTED, DOH, OFM, DNR, WDFW, DSHS, WSDOT, DOR, Ecology, IAC, DIS, Secretary of State, DIS-ISB/GIT, EMD, WSP, WSCC, DAHP, LEG

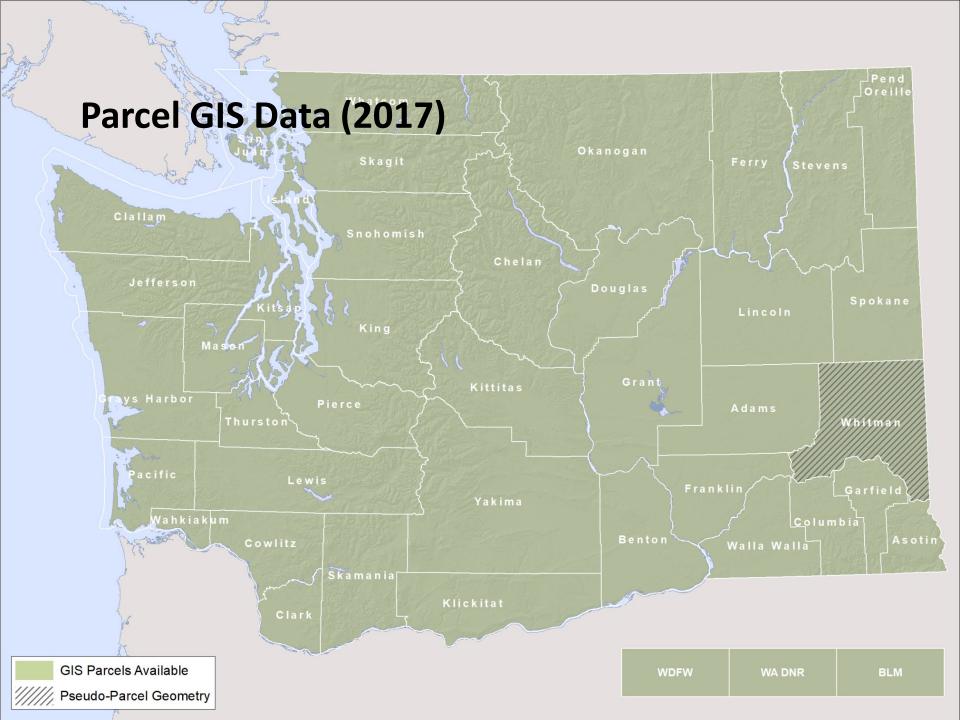
Federal

 USGS, BLM, FGDC, EPA, USFS, USBR, FEMA, DHS, BPA

University

University of Washington





Water Rights Mapping and Research, Everett Smelter 10 Home cleanup, Individual domestic wells, Aiding in mapping of water rights., Parcels data for environmental cleanup sites in Washington State., Columbia River Water Resource Information System, Water right mapping, Source Control, screening landowners during forest practice application process, Lower Duwamish Source Control, Columbia River Water Management Program, Forest Tax Discovery, Identification of gas station owners in Western Washington, Forest Fire Protection Assessment Whatcom & Skagit County, entering WA state water rights into GIS, Area-Wide Soil Contamination Central Region, historical contamination sources, Water Right Mapping In King County, Washington State Parcel Database, Historic structure inventories, Appraisal of real property for eminent domain acquisition, for State highway right of way., State wide Total Maximum Daily Load Study, WSDOT properties, Parcels for mitigating a wetland site, Pavement Preservation, Identification of contaminant dischargers to Puget Sound Area, Disaster Management, Identify property owners adjacent to WSDOT Right of Way, MTCA "Early Notice" Letters, Identification of underlying property owner where illegal sign is located, Columbia River land use delineation, pacific wood treating, Identification of contaminated sites and ownership, Parcel land use identification of Sulliva A 2008 survey identified hundreds of projects and programs that relied on parcel and Hazard

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A 2008 survey identified hundreds of projects and programs that relied on parcel and tax roll information. The Washington State Parcel Database has been the foundation of over 240 projects by 59 agencies.

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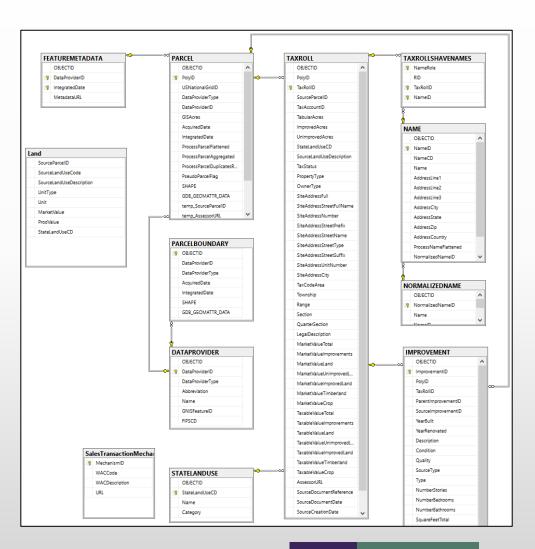
Survey,

e Farm

Kitsap County Solid & Hazardous Waste Program, Hydraulic Violation Investigation, Landscape PHS, On-Site Sewage Treatment System Risk Evaluation, Identification of property owners of potentially contaminated sites, Identification of public lands and boundaries for customer service proposes, fish passage inventory and habitat assessment, Identification of boundaries for public tidelands in Puget Sound, Identification of property owners near streams for habitat restoration projects in Washington State, County Grading Permit Application, Water system consolidation and restructuring, Various Toxic Cleanup Investigations, Identification of landowners in Washington State., Personal Recreation Dock, Snow goose quality hunt, Taneum Water Acquisition, private lands habitat, Cougar spatial and habitat use in relation to human development, Identification of State Owned Aquatic Land In Washington Sate, Thurston County marine shores landslide hazard zone mapping, Mason County marine shores landslide hazard zone mapping, State map geologic mapping project(s), Lincoln County basalt flow stratigraphic characterization, Active state issued water rights in Washington's thirteen eastern counties, Annexations, Small Area Estimate Program (SAEP), Selection and follow-up of wetland mitigation sites, Identification of parcel sizes and zoning for review of subdivision proposals., Identification of adjacent parcel owners in Washington State, Identification of private landowners throughout eastern Washington, Forest Protection Assessment Review, Land tenure and core wildlife habitats in Eastern WA (Region 1), Identification of land holders of abandoned metal mine lands, Mapping of Historical Statewide Water Rights, identification of landowners as part of water rights investigations, Locations of Tribal Interest Lands in Washington State, Tax Code Area map update, Forest Excise Tax Verification, Identification of homes with possible lead contamination, Urban Growth Areas for Growth Management, OFM-City annexation census support, Non-federal ownership in Washington, Identification of parcel information within the NSC footprint., WSDOT Local Program Roadway Projects, Parcel Ownership, Wildlife Habitat Linkage Zone identification, Identification of properties with potential for wetland mitigation, Identifying owners adjacent to the highway, Identifying property owners and property boundaries for parcels impacted by WSDOT road expansion/improvements., Access Management, Identification of property and property owners within the state of Washington, Identification of parcel owners in North Central Region, Identification of forest research sites, Identification of stream landowners in Washington State, Washington Statewide Parcel, SW Region Wetland Mitigation Site Selection, Section 106 Project Area Maps, Identification of family forest landowners in Washington State, Buying highway right of way, Jefferson/Clallam county forest fire protection assessment, Identify nearby property owners, Flood Plain Determinations, Identification of Schools and Childcares for the Soil Safety Program, Integrated Project Review and Mitigation Tools Initiative, DOH Standard Geocoding Process, Adult Health Survey, Washington Location Finder, Development Proposals, ID of private landowners involved in wildlife recovery projects, Species of concern data management and planning, Identify ownership of tidelands, ID landowners in Washington state, Northwest Region Leaking Underground Storage Tank sites, Washington Department Fish & Wildlife - District Wildlife Biologist usage of parcel data, overlay of bald eagle nest locations with individual property owners, Identification of owners of critical habitat, Identification of ownership of potential wildlife area acquisitions, Geocode potential risks for registered sex offenders Analyze forest conversion risk Farmland preservation

Parcel Database

- It's not a flat attribute table!
- Microsoft SQL Server Relational Database
- Geospatial Database
 - Parcel
 Taxroll
 Name
 Improvements
 Sales
- Includes more than just the most recent record
- One-to-many relationship for:
 - Parcel to Taxroll, Improvement, and Sales
 - Taxroll to Name







Methods - Parcel Database

- Parcel boundary and tax roll data was collected from each county in Fall 2019
- Parcel data also acquired from Forest Service, BLM, WA DNR, WDFW
- Data Normalization
 - Parcel geometry is deduplicated/aggregated
 - A common set of attributes is identified
 - Original data is retained and process is documented
- Normalize name across counties
 - Fuzzy matching = not perfect!
- Owner class is assigned using comprehensive name lists

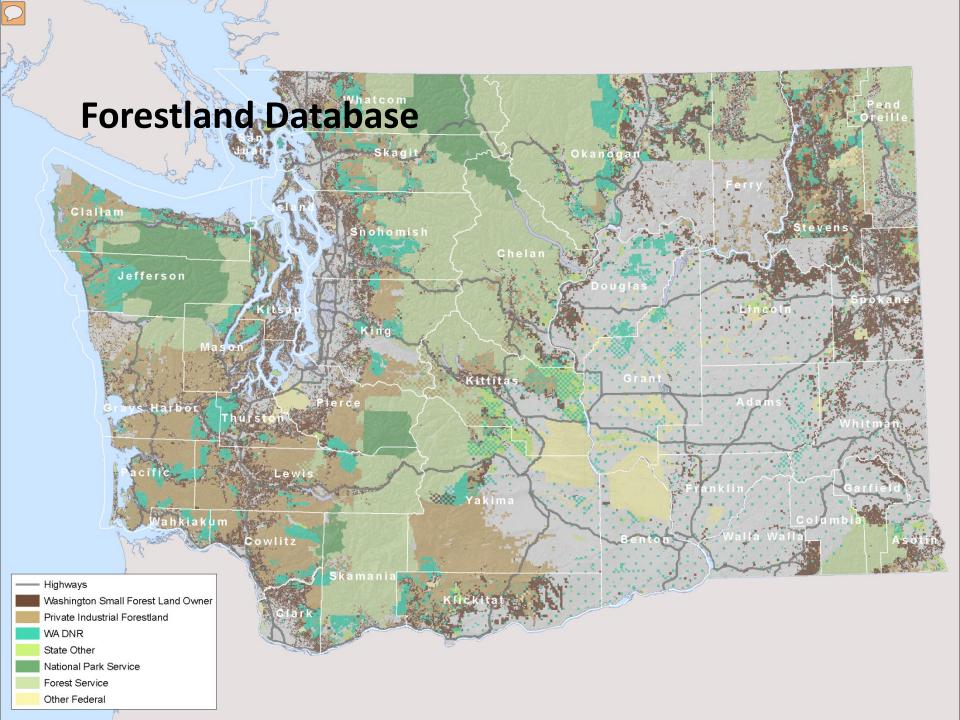
Parcel Data Is:

- Owner Name(s)
- Site Address
- Mailing Address
- Location
- Dimensions
- Land Use
- Value
- Tenure

Owner classes:

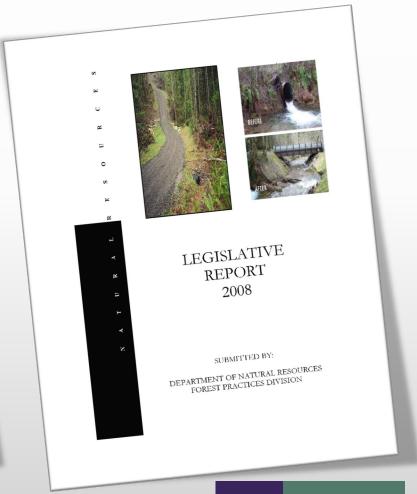
- Private
- Municipal
- Tribal
- State
- Federal





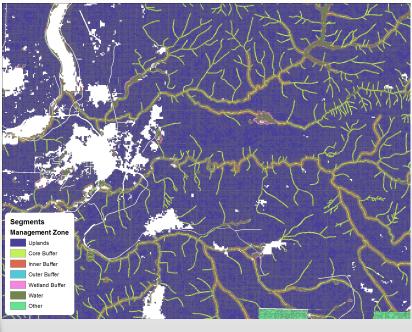
Forestland Database

UNIVERSITY OF WASHINGTON - COLLEGE OF FOREST RESOURCES The 2007 Washington State Forestland Database Final Report Luke W. Rogers and Andrew G. Cooke prepared under contract for the USDA Forest Service



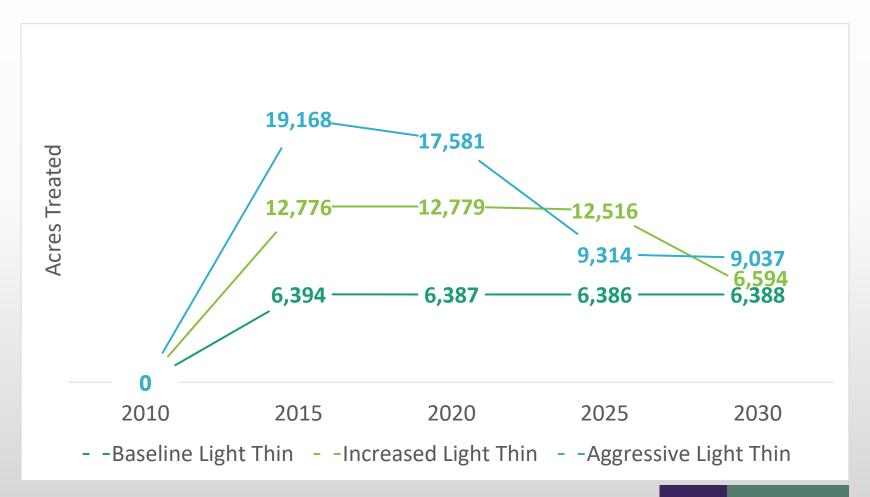
Biomass Assessment





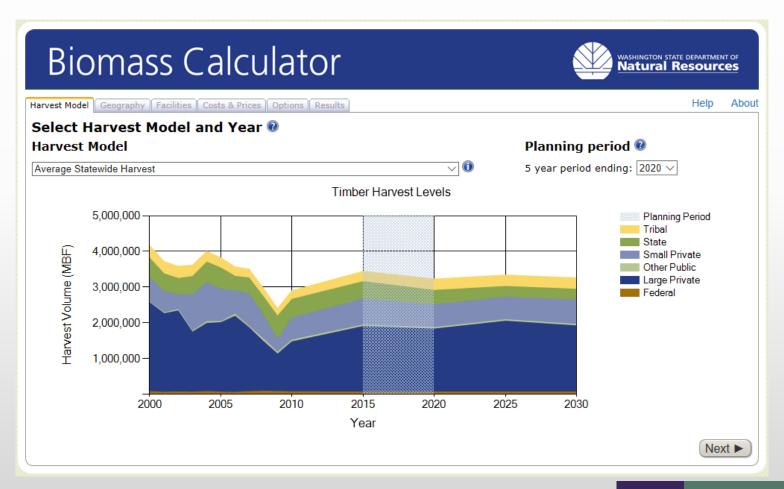


Forest Health Treatments



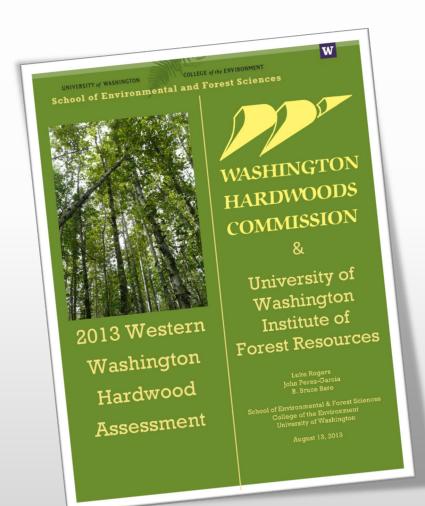


Biomass Calculator





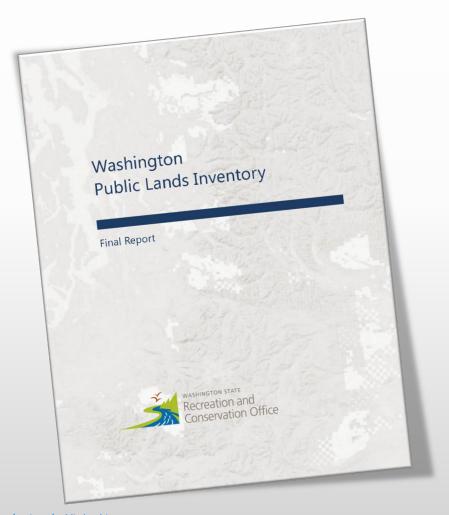
Hardwood Inventory

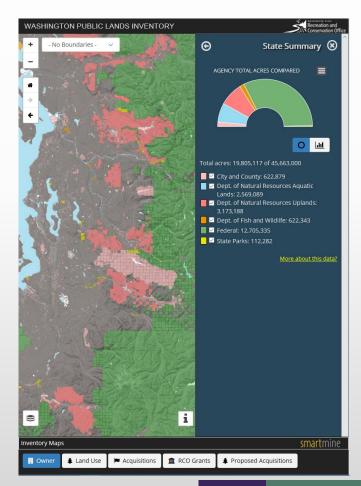






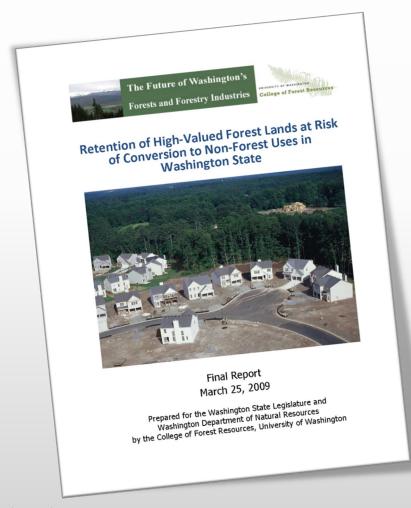
Public Lands Inventory

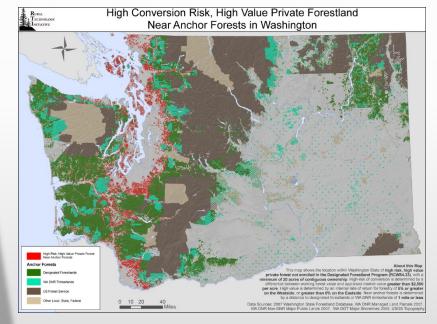






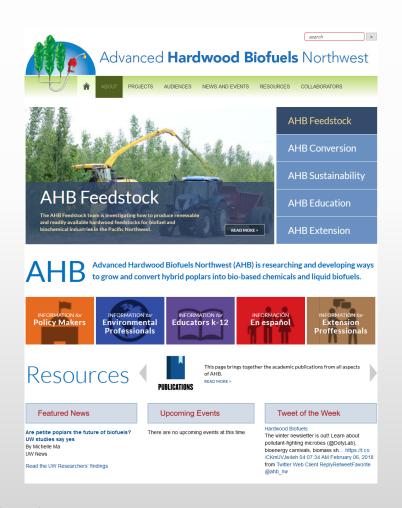
Strategic Forest Retention

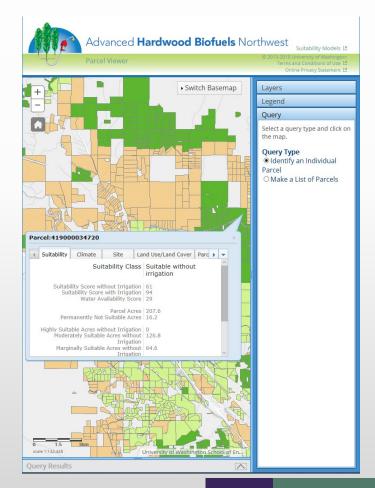






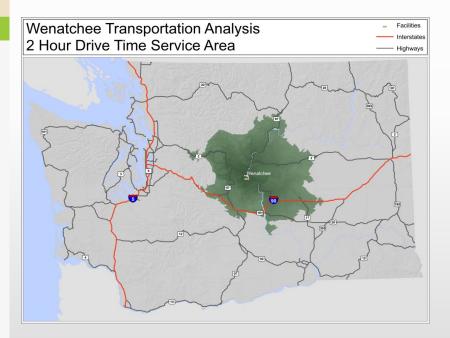
Advanced Hardwood Biofuels NW





Waste to Wisdom

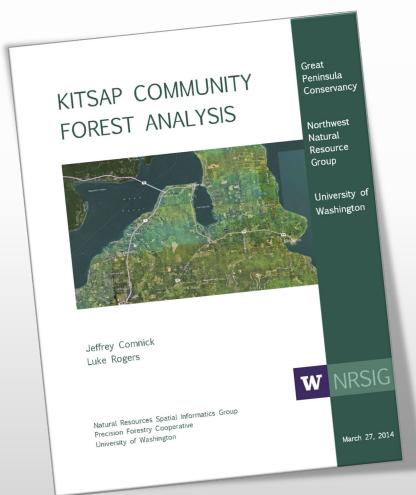
"UTILIZING FOREST RESIDUES FOR THE PRODUCTION OF BIOENERGY AND BIO-BASED PRODUCTS." MEET THE TEAM | PARTNERS | JOIN THE CONVERSATION | BLOG | CONTACT US | 1 0 0 0 Benefits SUSTAINABILITY ANALYSIS **Economic Feasibility** The Sustainability Analysis team will evaluate the economic feasibility of the three biomass conversion technologies developed in the Biomass Conversion Technology technical area that will use the biomass feedstocks developed in the Feedstock Development technical area, including the costs and benefits of storing carbon on forest sites under carbon cap and trade regulations. **Economic and Social Impacts** We will evaluate the economic and social impacts of implementing the proposed conversion technologies with an ${\sf N}$ emphasis on rural communities, including an estimation of the avoided costs achieved by using forest residues to produce bioenergy products. **Ecological Sustainability** We will determine the ecological sustainability of the three conversion technologies, focusing on forest soils (including carbon storage and nutrient cycling), forest productivity, water quality and air quality. Life Cycle Assessment We will conduct a life cycle impact assessment for the three conversion technologies including a cradle-to-grave life cycle inventory for each of the individual systems. **Educating and Involving Stakeholders** Involve community stakeholders and other interested parties in the initial development phase of the project to identify and incorporate stakeholder concerns in the project design and implementation and effectively communicate project results and information to these groups to encourage the adoption of the biomass conversion technologies.

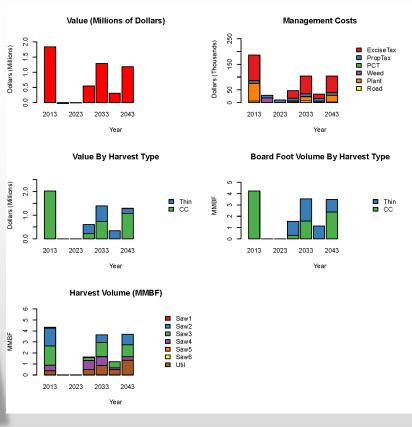




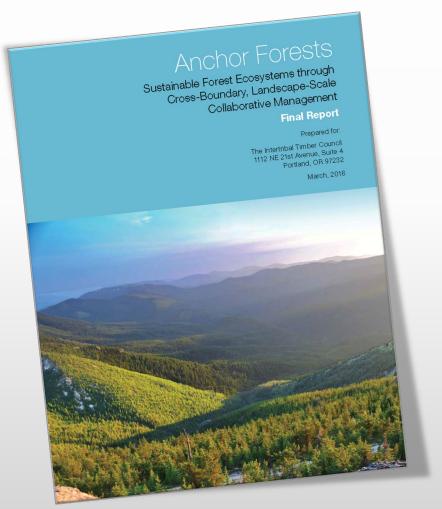
Learn more about sustainability analysis →

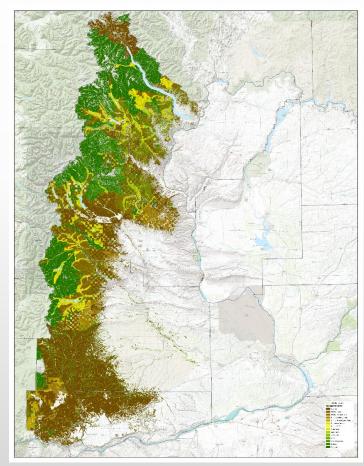
Port Gamble Forest





Anchor Forests

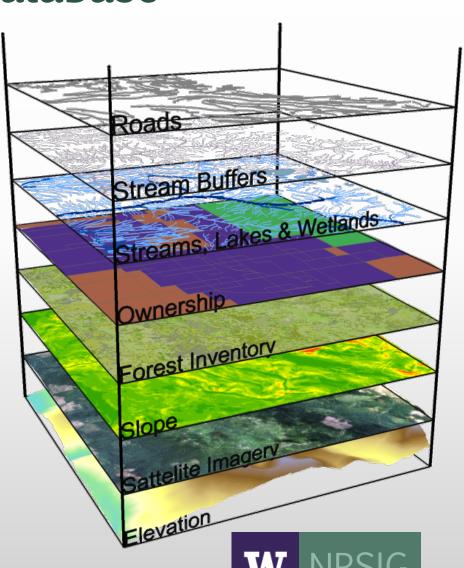








- Parcel flattening
 - A single parcel was selected where overlapping occurred from multiple data providers (county, state, federal)
- Intersect with agricultural layers
 - USDA NASS
 - WSDA Agricultural Land Use
- Intersect with stream and water buffers (from Forestland)
- Identify Ag parcels by:
 - Land Use Code 81, 82, or 83
 - OR Parcels with >= 1 acres of cultivated area by WSDA Cropland Layer
- Divides ag land into ~12.4M segments





WSD	Owner Class
Buffe	NASS





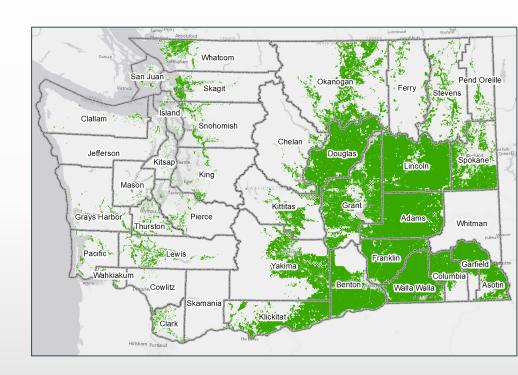
Additional Attributes:

- Half State, County, WRIA, WAU, Legislative District, Congressional District
- Acres: Parcel, Tract, Name, Farmed
- Land Use Code, Zoning, and Housing Density
- Acres by Crop Group (WSDA and NASS) and Irrigation Type (WSDA)
- Stream Length by type and Acres by riparian zone
- Road Length
- Proximity to Development, Urban Growth Area, Roads, and Forest Service
- Most Recent Sale and/or Inherited Date
- Market Value of Land, Crop, and Improvements
- Taxable Value of Land
- Tax Benefit (Market Value Per Acre Taxable Value Per Acre)



Results - Agland in 2019

- 193,000 parcels
- 12.4 million parcel acres (28%)
- 6.7 million cultivated acres
- 92,000 owners
- Avg Parcel Acres: 55.0
- Avg Tract Acres: 327.3
- Avg Name Acres: 1,069.4

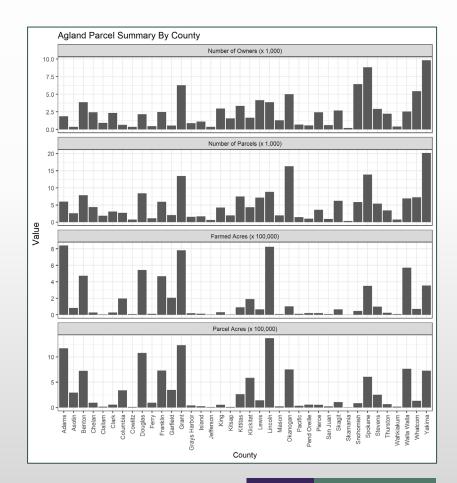




Results - By Half State (2019)

- Western Washington:
 - 36,000 owners
 - 54,000 parcels
 - 909,000 parcel acres
- Eastern Washington:
 - 57,000 owners
 - 139,000 parcels
 - 11.5M parcel acres

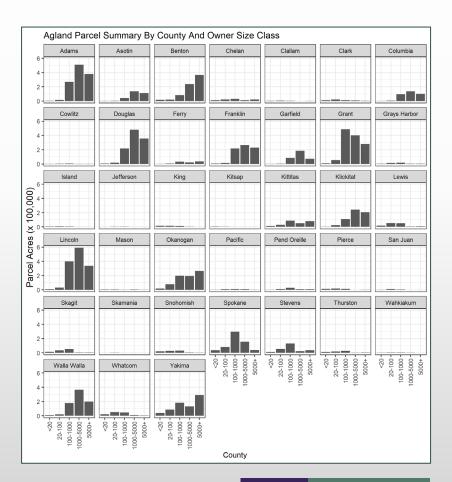
Avg. Acres	Western WA	Eastern WA
Parcel	15.0	68.5
Tract	37.9	396.7
Owner	86.0	1278.7





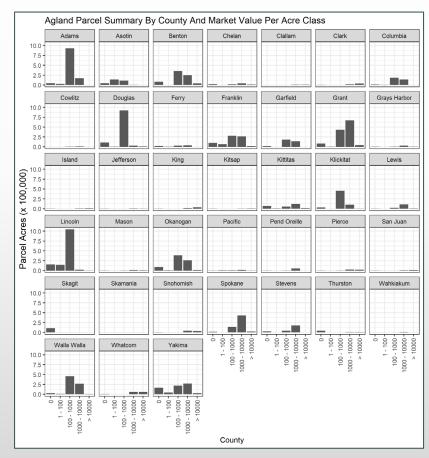
Results - By Owner Size Class (2019)

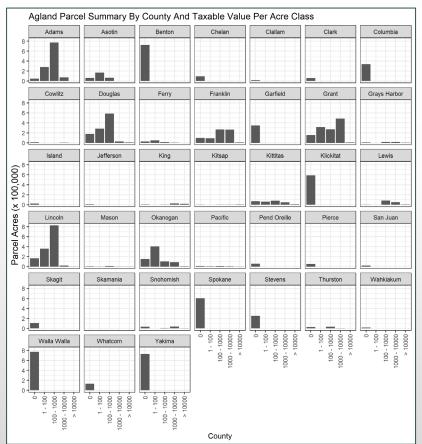
- Smallest size class (<20 acres):
 - 56% of owners
 - 2.9% of parcel acres
- Two largest size classes (1000-5000 acres, 5000+ acres):
 - 3.5% of owners
 - 62% of parcel acres





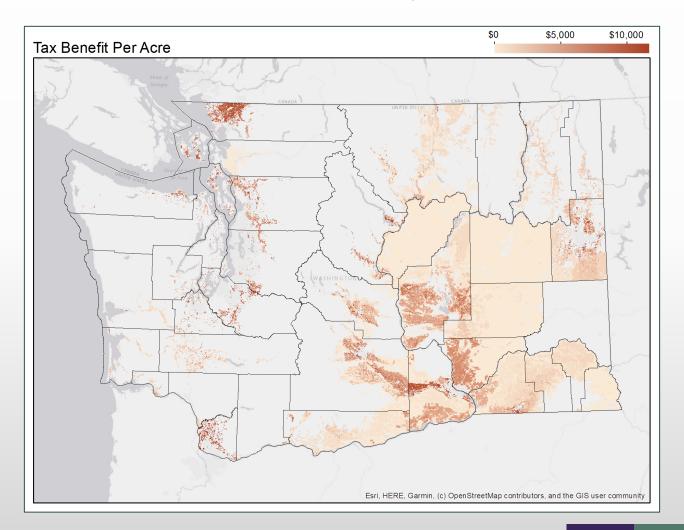
Results - Value (2019)





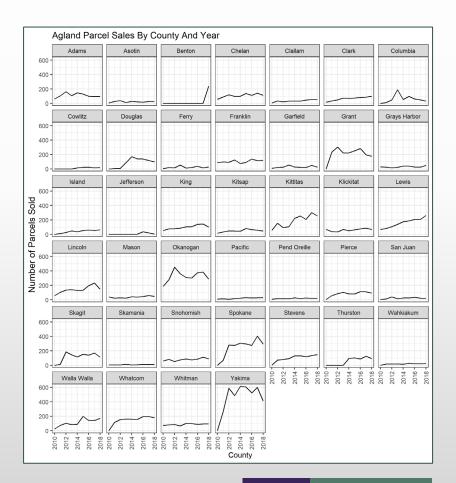


Results - Tax Benefit (\$/Acre) (2019)



Results - Sales (2019)

- Increasing sales in Clark, Kittitas, Lewis, Spokane, Stevens, Walla Walla, Whatcom (?)
- High sales (>200 annually) in Grant, Okanogan, Spokane, Yakima
- Sales data generally exists after 2010, some counties go back farther







- Using previous versions of the Parcel Database, the first spatial data was identified for each county (generally 2007; as late as 2012)
- The 2007 version of the Agland Database was developed
 - NASS Cropland but no WSDA Cropland
- 2007 and 2019 versions were unioned; parcels with at least 30% overlap were assumed to be related for the purpose of identifying parcels that transitioned out of or into Agland
- Basis for change analysis



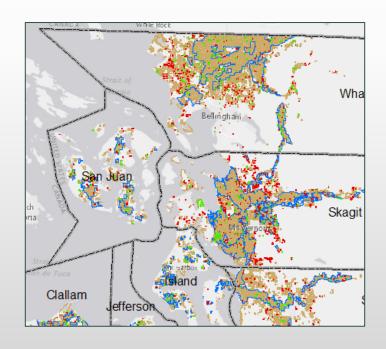
Results - Change between 2007 and 2019

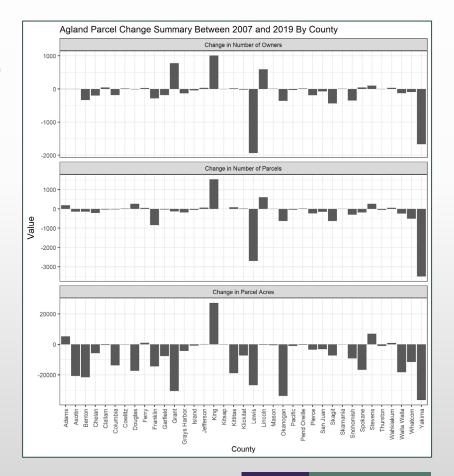
- WSDA layer was not available for 2007
- We restricted change analysis to Agland parcels identified by land use code
- We did not normalized names in 2007
- We compared non-normalized names in 2007 and 2019 (so 2019 owner numbers are slightly different and less accurate)
- 10.3M of 12.4M parcels acres from 2019
- 120,000 of 193,000 parcels from 2019
- 49,500 owners of 92,000 from 2019



Results - Change between 2007 and 2019

- Parcels declined by 7,800
- Parcel acres declined by 292,000
- Owners declined by 4,000





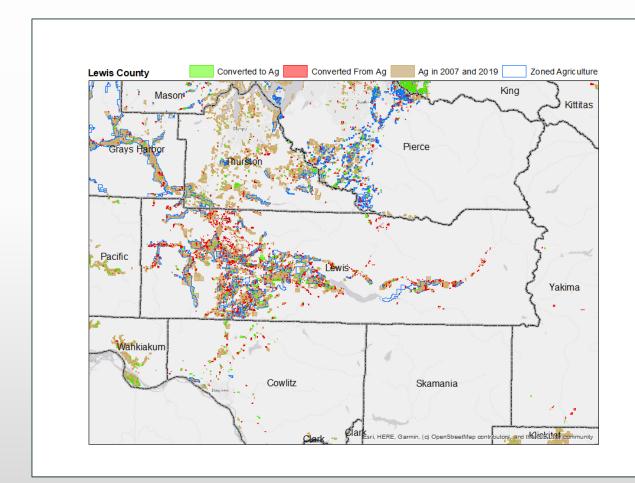


Results - Change in Lewis County

Parcels: -2,700

• Acres: -27,000

• Owners: -1,930



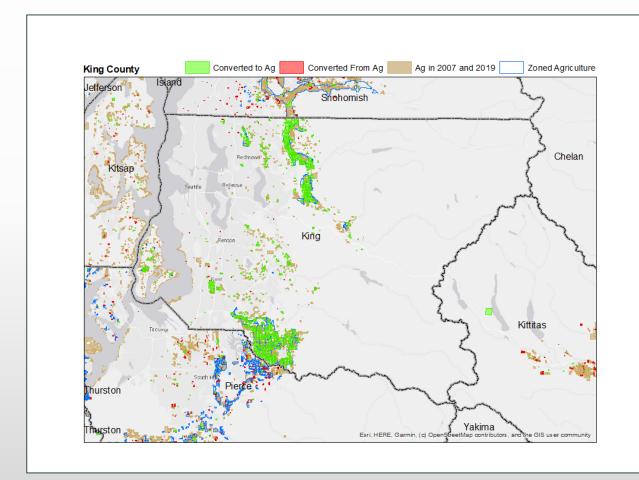


Results - Change in King County

Parcels: +1,500

• Acres: +29,000

Owners: +1,000





PSAA Fact Sheet

Agricultural land in Puget Sound Action Areas: results from the 2019 Washington State Agland Database

Natural Resource Spatial Informatics Group Precision Forestry Cooperative

School of Environmental and Forest Sciences
University of Washington

Project Information:

www.nrsig.org

www.nrsig.org/projects/parcels

www.nrsig.org/projects/ washington-state-agland-database

Introduction

A new spatial database of agricultural parcels in Washington state has been developed¹. The database provides a census of all agricultural parcels in 2019² and enables parcel-level change analysis between 2007³ and 2019. Parcels located in Puget Sound Action Areas are summarized here. Each parcel is attributed with:

- Owner class (private, tribal, municipal, state, or federal)
- Owner name and contact information (contact us)
- Acres (parcel, tract, farmed, and owner total)
- Crop type
- Length of roads and streams
- Zoning and housing density
 Watershed (WRIA and WAU)
- Location (county, congressional district, legislative district)
- Proximity to development and urban growth area
- Market and taxable value (land and improvements)
- Most Recent Sales



Map 1. Puget Sound Action Areas.

Methods: The Washington State Parcel Database

The Agland Database is based on the updated Washington State Parcel Database. The Parcel Database is a standardized, statewide parcel layer stored in a Microsoft SQL Server database. Versions were developed in 2007, 2009, 2010, and 2012, with a partial update in 2016. Tabular and spatial data are collected from each county as well as state and federal agencies. Sales data was acquired from each county and from the Washington State Department of Revenue. Address, land use code, sales, and other data are normalized prior to loading into the Database. Owner names are normalized across counties to identify likely common owners despite small differences in names and addresses. Where parcels from different data providers overlap, a priority parcel is identified to create a wall-to-wall parcel layer without overlap for the state.

Methods: The Washington State Agland Database

The standardized parcel layer is intersected with roads, streams, waterbodies, jurisdictional layers, crop, and other layers. The Washington State Department of Agriculture (WSDA) and National Agriculture Statistics Service (NASS) Cropland layers provide estimates of crop type for each parcel. Agricultural parcels are identified as those with a land use code its, 82, or 83 or farmland according to the WSDA layer. Because WSDA was not available with parcel-level spatial resolution for the 2007 version, change results are limited to comparing land use codes. To analyze change, we unioned the parcel layers from the 2007 and 2019 version of the Agland Database. A minimum overlap of 30% was used to determine parcels that converted into or out of agricultural land since 2007.

Results: Agricultural Parcels in 2019

Puget Sound Action Areas contained 511,000 acres of farmland in 2019. There were 36,000 parcels held by 26,000 owners. The average parcel size was 11.9 acres. The average tract (a contiguous set of parcels owned by the same person) was 32.2 acres. The average owner holds 424.8 acres. By land use class, 51% of parcels (68% of acres) were agricultural (codes 81, 82, or 83), 32% (15%) were residential (codes 0 – 19), and 14% (14%) were undeveloped (codes 84 – 99).

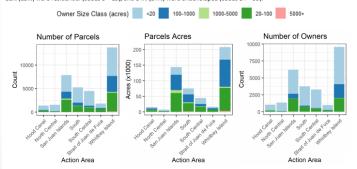


Table 1. Summary statistics for 2019 by Puget Sound Action Area.

PSAA	Num Parcels	Parcel Acres	Avg Parcel Acres	Avg Tract Acres	Avg Owner Acres	Num Owners
Hood Canal	1,379	15,504	11.2	27.4	280.6	1,041
North Central	1,539	7,547	4.9	7.7	10.3	1,355
San Juan Islands	7,864	144,221	18.3	44.3	252.1	6,098
South Central	4,468	44,585	10.0	19.8	302.8	3,275
South Puget Sound	5,263	75,099	14.3	40.4	322.5	3,760
Strait of Juan de Fuca	1,805	16,459	9.1	35.5	355.3	982
Whidbey Island	13,718	207,748	15.1	50.6	1,450.2	9,515
	36,036	511.163	11.9	32.2	424.8	26,026

Results: Change in Agricultural Parcels between 2007 and 2019

The net change in farmland in Puget Sound Action Areas between 2007 and 2019 was a decline of almost 15,000 acres and 625 parcels. Farmland declined in all Action Areas except South Central. Change is based on assessor land use codes only and may not represent actual change of land use or land cover.

Table 2. Summary statistics for change between 2007 and 2019 by Puget Sound Action Area.

PSAA	Num Parcels	Parcel Acres	Avg Parcel Acres	Avg Tract Acres	Avg Owner Acres	Num Owners
Hood Canal	33	(93)	(2.4)	6.8	59.8	32
North Central	12	(148)	(1.5)	(2.8)	(4.2)	6
San Juan Islands	(709)	(16,151)	(0.3)	9.8	49.8	(187)
South Central	946	13,781	0.7	6.0	40.4	656
South	(242)	(4,028)	0.9	19.0	107.6	(170)
Strait of Juan de Fuca	(21)	(112)	0.1	6.4	318.9	63
Whidbey Island	(642)	(8,087)	0.5	15.6	117.1	(557)
	(623)	(14,837)	(0.3)	8.7	98.5	(157)

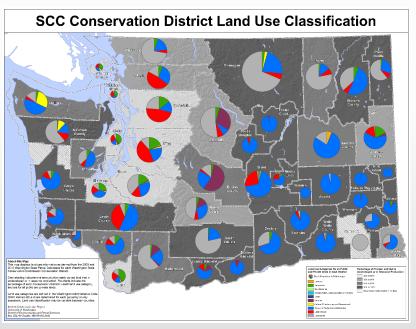
¹ Agland Database. 2019. Natural Resource Spatial Informatics Group, Precision Forestry Cooperative, School of Environmental and Forest Sciences, University of Washington.

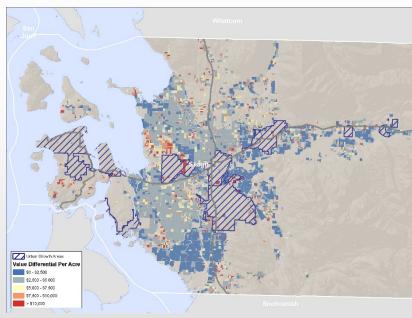
² Whitman County provides tabular data only and is not included in the Agland Database.

³ First year with spatial data (number of counties): 2007 (27 counties); 2009 (9 counties); 2012 (1 county).

⁴ Parcel Database. 2019. Natural Resource Spatial Informatics Group, Precision Forestry Cooperative, School of Environmental and Forest Sciences, University of Washington.

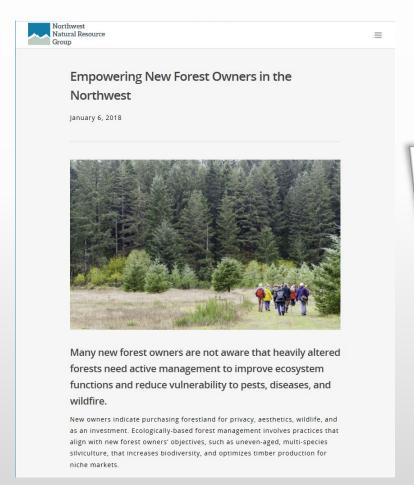
Agriculture







Outreach & Extension







Landowner Outreach

- Can generate mailing lists for landowner outreach, field days, grant opportunities and educational events
- Contact <u>lwrogers@uw.edu</u> for assistance



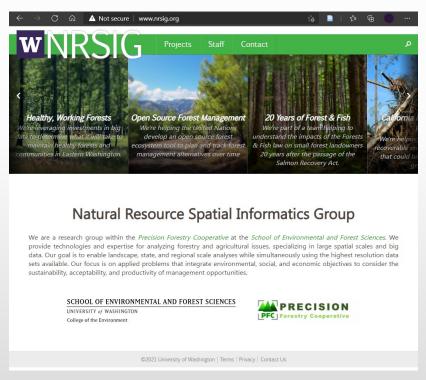
Data request form at:

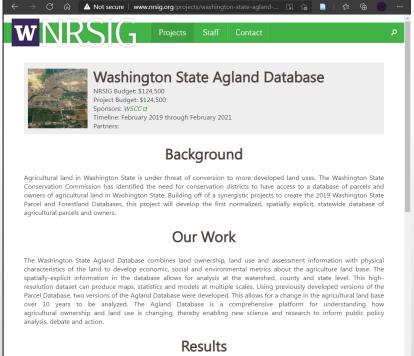
https://nrsig.org/projects/washington-state-agland-database



Project Website

https://nrsig.org/projects/washington-state-agland-database







Accessing the Data

- Currently setting up a web service for use in common mapping platforms
- https://nrsig.org/apps/agr/



Thank you

- This project has been funded wholly or in part by the United States
 Environmental Protection Agency under assistance agreement PC-01J18101
 through the National Estuary program and the Stormwater Initiative at the
 Washington State Department of Ecology
- Thank you to the Washington State Conservation Commission for advocating for and supporting this project