

PACIFIC NORTHWEST  
**Forest Inventory  
& Analysis**

# Newsletter

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## A Message From the Program Manager

In our last newsletter we introduced the idea that the Forest Inventory and Analysis (FIA) Program is much more than plot data and databases. We are working on an amazing array of projects to make sure that we make the most of the inventory data we collect. Our aim is to address issues of importance to the scientific world and that have value for our land management partners and clients. We are continuing that story here with more information on our efforts to improve the inventory, reduce our costs, expand our tools and techniques, and do what has been our bread and butter for 60 years, summarize the status and trends of forest land conditions in our 5-year reports, Resources Planning Act assessments, and much more.

The research teams have set up five emphasis areas to categorize their work; Land Cover and Land Use, Ecological Dynamics, Forest Health, Resource Inventory Techniques, and Forest Resource Assessment. In the last issue of this newsletter, we included work on the first three, and now is the time to highlight the final two areas. We again provide links from the brief descriptions here to more information contained in pop-up windows as you move your cursor over the "Objective" and "How" for each project. As always, we would love to hear from you if there are areas of interest to you. Feel free to contact me, or better yet, go directly to the FIA investigator listed for each project.

On other topics, we are in our eighth season of annual inventory in Oregon and California, seventh annual season in Washington, and fifth annual season in coastal Alaska. We are almost ready to think about the possibility that we will start remeasurement in this lifetime! We are very pleased with our returning field crews and the excitement is growing about the 2008 field season. Our program safety committee is always hard at work looking for ways to help everyone have a safe and healthy field season. Their work over the last several years has produced a safety reward system, a near-miss reporting system, and an annual survey of safety attitudes and potential improvements. We are receiving an increasing list of suggestions for new and improved safety procedures and techniques. We have completed processing and quality checks on the 2007 inventory data and have posted it on the national FIA Web site. Last, but never least, we continue to work on 5-year reports. The Oregon and California 5-year reports have been shipped off to layout and printing and we have sent a draft Washington report out for review. I suspect that we will have a future newsletter devoted just to the 5-year reports to let you know more about what they say about your state.

– Sue Willits, PNW-FIA Program Manager

## Current Resource Inventory Techniques Research and Development Projects

### Airborne Laser Scanner Data as a Sampling Tool

FIA Investigators: Hans Andersen, Ken Winterberger

Cooperative Investigators: Robert McGaughey and Steve Reutebuch (PNW Research Station, Seattle), Gerard Schreuder (University of Washington)

### Accuracy of GPS-Derived FIA Plot Coordinates

FIA Investigators: Hans Andersen, Ken Winterberger

Cooperative Investigators: Steve Reutebuch (PNW Research Station, Seattle), Gerard Schreuder (University of Washington)

### Optimizing Stratification for Forest Estimation

FIA Investigators: Hans Andersen, Ken Winterberger, Tara Barrett

### Predicting Cavity Tree Abundance

FIA Investigator: Tara Barrett

Cooperative Investigator: Temesgen Hailemariam (Oregon State University)

### Site Quality Estimation

FIA Investigator: Tara Barrett

Cooperative Investigators: Greg Latta and Temesgen Hailemariam (Oregon State University)

### Predicting Current Forest Attributes From a Panelized Inventory System

FIA Investigator: Tara Barrett

Cooperative Investigators: Bianca Eskelson and Temesgen Hailemariam (Oregon State University)

### Sampling and Estimation of Forest Vegetation in the United States

FIA Investigator: Beth Schulz

### Using FIA Vegetation Data for Classification

FIA Investigator: Beth Schulz

Cooperative Investigator: Rob DeVelice (Chugach National Forest, Alaska Region)



**PNW-FIA Research Team Members****Portland FIA Environmental Analysis and Research Team**

Jeremy Fried, Team Leader  
David Azuma, Research Forester  
Demetrios Gatzliolis, Research Forester  
Andy Gray, Research Ecologist  
Vicente Monleon, Mathematical Statistician

**Portland FIA Inventory Reporting Team**

Sally Campbell, Team Leader  
Joe Donnegan, Ecologist  
Glenn Christensen, Forester  
Karen Waddell, Forester  
Sarah Jovan, Research Ecologist (OSU Postdoctoral Fellow)

**Anchorage FIA Analysis and Research Team**

Tara Barrett, Team Leader  
Hans-Erik Andersen, Research Forester  
Beth Schulz, Research Ecologist  
Kenneth Winterberger, Forester

For information on how to contact the researchers above, please visit:

[http://www.fs.fed.us/pnw/fia/contact/fiaemployees\\_team.shtml](http://www.fs.fed.us/pnw/fia/contact/fiaemployees_team.shtml)

**Verifying Map Accuracy for Sudden Oak Death Host Species Abundance**

FIA Investigators: Jeremy Fried, Vicente Monleon

**Validation of Mapped Riparian Forest Stands**

FIA Investigators: Demetrios Gatzliolis, Jeremy Fried

Cooperative Investigator: Rus Congalton (University of New Hampshire)

**Characterizing Coastal Oregon Forests with LIDAR**

FIA Investigator: Demetrios Gatzliolis  
Cooperative Investigator: Sorin Popescu (Texas A&M University)

**Validating Fire Effects Models**

FIA Investigators: Dave Azuma, Jeremy Fried

**Effect of Plot Design on Land Area Classification**

FIA Investigators: Dave Azuma, Vicente Monleon

**Evaluation of Subalpine Vegetation With LIDAR**

FIA Investigator: Demetrios Gatzliolis  
Cooperative Investigators: Harold Zald (Oregon State University), Tom Spies (PNW Research Station, Corvallis)

**Assessment of Wildfire Severity and Forest Recovery With LIDAR and Multispectral Imagery**

FIA Investigator: Demetrios Gatzliolis  
Cooperative Investigator: Bernard Bormann (PNW Research Station, Corvallis)

**Plot Size and Bias**

FIA Investigator: Demetrios Gatzliolis

**Digital Clinometer and Distance Finders**

FIA Investigator: Demetrios Gatzliolis

**Small Area Estimates of Forest Attributes**

FIA Investigator: Vicente Monleon  
Cooperative Investigator: Temesgen Hailemariam (Oregon State University)

**Mixed Models to Predict Tree-Level Attributes**

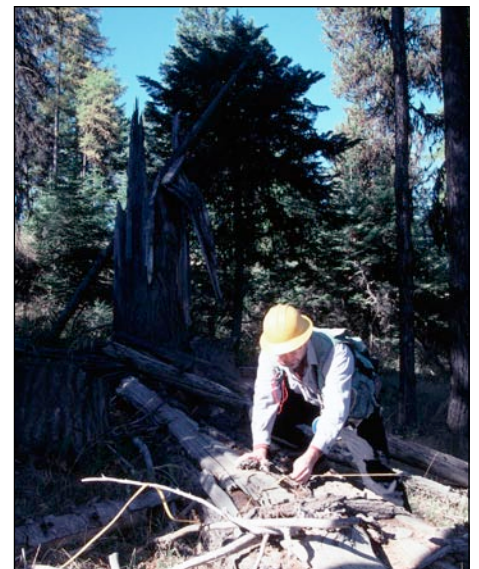
FIA Investigator: Vicente Monleon  
Cooperative Investigator: Temesgen Hailemariam (Oregon State University)

**Monitoring Future Local Climate Changes With Plant Abundance**

FIA Investigators: Vicente Monleon, Andy Gray  
Cooperative Investigator: Tim Brady (University of California, San Francisco)

**Tree Species Distribution Predictions**

FIA Investigator: Andy Gray  
Cooperative Investigator: Heather Lintz and Bruce McCune (Oregon State University)



## Forest Resource Assessment, Characterization, and Estimation of Change

### Commonwealth of the Northern Mariana's (CNMI) Forest Resource Assessment

FIA Investigator: Joe Donnegan

### Oregon Forest Resource Assessment

FIA Investigators: Joe Donnegan, Sally Campbell, Dave Azuma, and others

Cooperative Investigator: Jason Brandt (University of Montana)

### California Forest Resource Assessment

FIA Investigators: Glenn Christensen, Sally Campbell, Jeremy Fried, and others

Cooperative Investigator: Todd Morgan (University of Montana)

### Washington Forest Resource Assessment

FIA Investigators: Sally Campbell, Andy Gray, Karen Waddell, and others

Cooperative Investigators: Todd Morgan (University of Montana), Dorian Smith (Washington Department of Natural Resources)

### Distribution and Diversity of Forest Vegetation in Utah

FIA Investigator: Beth Schulz

### Use of Airborne LIDAR to Estimate Biomass

FIA Investigator: Hans Andersen

Cooperative Investigators: Glen Murphy (Oregon State University), Steve Reutebuch (PNW Research Station, Seattle)



### Use of Spaceborne LIDAR to Assess Carbon Stocks

FIA Investigator: Hans Andersen

Cooperative Investigators: Ross Nelson (NASA-Goddard), Hank Margolis (Laval University), Guoqing Sun (University of Maryland), Mike Wulder (Canadian Forest Service)

### Use of Spaceborne LIDAR to Measure Canopy Height

FIA Investigator: Hans Andersen

Cooperative Investigator: Michael Lefsky (Colorado State University)

### FIA Biomass Summarization (BioSum)

FIA Investigators: Jeremy Fried, Glenn Christensen, Bruce Hiserote, Larry Potts, P.J. Daugherty

Cooperative Investigator: Jamie Barbour (PNW Research Station, Portland)

### Long-Term Vegetation Change in California's Central Sierra

FIA Investigator: Jeremy Fried

Cooperative Investigator: Maggi Kelly (University of California, Berkeley)

### Repeatability of FIA Phase 3 Vegetation Data

This study is part of a national assessment of quality objectives and repeatability of FIA measurements (Beth Schulz, with Dave Gartner, SRS).

### Vegetation Diversity

Vegetation data collected on FIA phase 3 field plots can be used as an indicator in forest health monitoring. This study is being published as a chapter in the 2007 Forest Health Monitoring national technical report and will demonstrate the use of FIA vegetation data as an indicator (Beth Schulz).

## Recent PNW-FIA Publications

Links to articles on the Web follow some publications.

- Barbour, R.J.; Fried, J.S.; Daugherty, P.J.; Fight, R. 2008. Predicting the potential mix of wood products available from timbershed scale fire hazard reduction treatments. *Forest Policy and Economics*. 10: 400–407. [http://pnwfia.info/jfried/pubs/ForPolEc\\_Barbour\\_et\\_al\\_2008.pdf](http://pnwfia.info/jfried/pubs/ForPolEc_Barbour_et_al_2008.pdf)
- Daugherty, P.J.; Fried, J.S. 2007. Jointly optimizing selection of fuel treatments and siting of biomass facilities for landscape-scale fire hazard reduction. *INFOR: Information Systems and Operational Research*. 45(1): 353–372. [http://pnwfia.info/jfried/pubs/daugherty\\_fried\\_infor\\_2007.pdf](http://pnwfia.info/jfried/pubs/daugherty_fried_infor_2007.pdf)
- Donnegan, J.A.; Butler, S.L.; Kuegler, O.; Stroud, B.; Hiserote, B.A.; Rengulbai, K. 2007. Palau's forest resources, 2003. *Resour. Bull. PNW-RB-252*. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 52 p.
- Donnegan, J.A. 2007. Detection monitoring—analysis and interpretation of forest health data in the U.S. In: *Proceedings of international symposium on forest health monitoring*. Seoul, Korea: Korea Forest Conservation Movement: 117–152.
- Eskelson, B.N.I.; Temesgen, H.; Barrett, T.M. 2008. Comparison of stratified and non-stratified most similar neighbour imputation for estimating stand tables. *Forestry*. 81(2): 125–134.
- Fried, J.S.; Barbour, J. 2007. Evaluating opportunities for biomass facility siting and economic feasibility of landscape-scale fuel treatment. In: González-Caban, A.; Haynes, R.W.; McCaffrey, S. [et al.], eds. *Fire social science research—selected highlights*. Gen. Tech. Rep. PNW GTR-736. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station: 31–34. [http://pnwfia.info/jfried/pubs/Fried\\_Barbour\\_2007\\_Highlight\\_gtr.pdf](http://pnwfia.info/jfried/pubs/Fried_Barbour_2007_Highlight_gtr.pdf)
- Fried, J.S.; Zhou, X. 2008. Forest inventory-based estimation of carbon stocks and flux in California forests in 1990. Gen. Tech. Rep. PNW-GTR-750. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 32 p. [http://pnwfia.info/jfried/pubs/pnw\\_gtr750.pdf](http://pnwfia.info/jfried/pubs/pnw_gtr750.pdf)
- Fried, J.S.; Gilles, J.K.; Riley, W.J.; Moody, T.J.; Simon de Blas, C.; Hayhoe, K.; Moritz, M.; Stephens, S.; Torn, M.S. 2008. Predicting the effect of climate change on wildfire behavior and initial attack success. *Climatic Change*. 87(Suppl 1): S251–S264. [http://pnwfia.info/jfried/pubs/climatic\\_change\\_fried\\_et\\_al\\_2008.pdf](http://pnwfia.info/jfried/pubs/climatic_change_fried_et_al_2008.pdf)
- Haight, R.G.; Fried, J.S. 2007. Optimizing initial-attack force with a standard-response siting model. *Information Systems and Operations Research*. 45(1): 385–398. [http://pnwfia.info/jfried/pubs/haight\\_fried\\_infor\\_2007.pdf](http://pnwfia.info/jfried/pubs/haight_fried_infor_2007.pdf)
- Jovan, S. 2008. Lichen bioindication of biodiversity, air quality, and climate: baseline results from monitoring in Washington, Oregon, and California. Gen. Tech. Rep. PNW-GTR-737. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 115 p.
- Kennedy, R.E.; Cohen, W.B.; Schroeder, T.A. 2007. Trajectory-based change detection for automated characterization of forest disturbance dynamics. *Remote Sensing of Environment*. 110(3): 370–386.
- Lundquist, J.E.; Zogas, K.P.; Snyder, C.L.; Schulz, B.K. 2008. Alaska biological control program directed at amber-marked birch leaf miner. *Western Forester*. 153(1): 12–13.
- Moser, W.K.; Hansen, M.H.; Nelson, M.D.; Crocker, S.J.; Perry, C.H.; Schulz, B.K.; Woodall, C.W.; Nagel, L.M.; Mielke, M.E. 2008. After the blowdown: a resource assessment of the Boundary Waters Canoe Area Wilderness. Gen. Tech. Rep. NRS-7. St. Paul, MN: U.S. Department of Agriculture, Forest Service, Northern Research Station. 55 p. <http://www.nrs.fs.fed.us/pubs/2286>
- Schroeder, T.A.; Gray, A.; Harmon, M.E.; Wallin, D.O.; Cohen, W.B. 2008. Estimating live forest carbon dynamics with a Landsat-based curve-fitting approach. *Journal of Applied Remote Sensing*. 2(1): 023519. <http://link.aip.org/link/?JRS/2/>
- Temesgen, H.; Monleon, V.J.; Hann, D.W. 2008. Analysis and comparison of nonlinear tree height prediction strategies for Douglas-fir forests. *Canadian Journal of Forest Research*. 38: 553–565.
- Woodall, C.W.; Monleon, V.J. 2008. Sampling protocol, estimation, and analysis procedures for the down woody materials indicator of the FIA Program. 2<sup>nd</sup> ed. Gen. Tech. Rep. NRS-22. St. Paul, MN: U.S. Department of Agriculture, Forest Service, Northern Research Station. 68 p.
- Zald, H.S.J.; Gray, A.N.; North, M.; Kern, R.A. 2008. Initial tree regeneration responses to fire and thinning treatments in a Sierra Nevada mixed-conifer forest, USA. *Forest Ecology and Management*. 256: 168–179. [http://pnwfia.info/agray/pubs/Zald\\_et\\_al\\_FEM08.pdf](http://pnwfia.info/agray/pubs/Zald_et_al_FEM08.pdf)

## Safety News

The PNW-FIA is striving to increase employee awareness of safety and health issues. To further encourage PNW-FIA employees to think of safety as an important part of their everyday lives, whether at work or at home, the PNW-FIA program has instituted a policy of mandatory “near-miss” reporting. “Near-miss” reporting is based on research that identifies the relationship between “mishaps” or “near misses” and actual incidents. Generally, it as



been found that there are several to hundreds of near misses for every incident occurrence. In other words, we have practice before we succeed at having an actual incident. By collecting near-miss information, reviewing it for trends and occurrences, and sharing the results, we can help each other avoid the hazardous situations resulting in a near miss or worse, an actual incident. Each team within PNW-FIA has been given a goal for near-miss reporting, and the safety committee has developed a system to electronically submit and summarize the information – and, most importantly, quickly return the information to the employees.



News for Pacific Northwest Research Station, Forest Inventory and Analysis Clients, Employees, and Retirees

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